PlexusDx

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Weight & Body Fat

Summary Report

REPORT CATEGORY

WEIGHT & BODY FAT

John Doe

Report date: 23 October 2024

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Personal information

NAME

John Doe

SEX AT BIRTH

Male

HEIGHT

5ft 11" 180.4cm

WEIGHT

177lb 80.3kg

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.

REPORT PROVIDED BY

PlexusDx

support@plexusdx.com

https://plexusdx.com

How this works

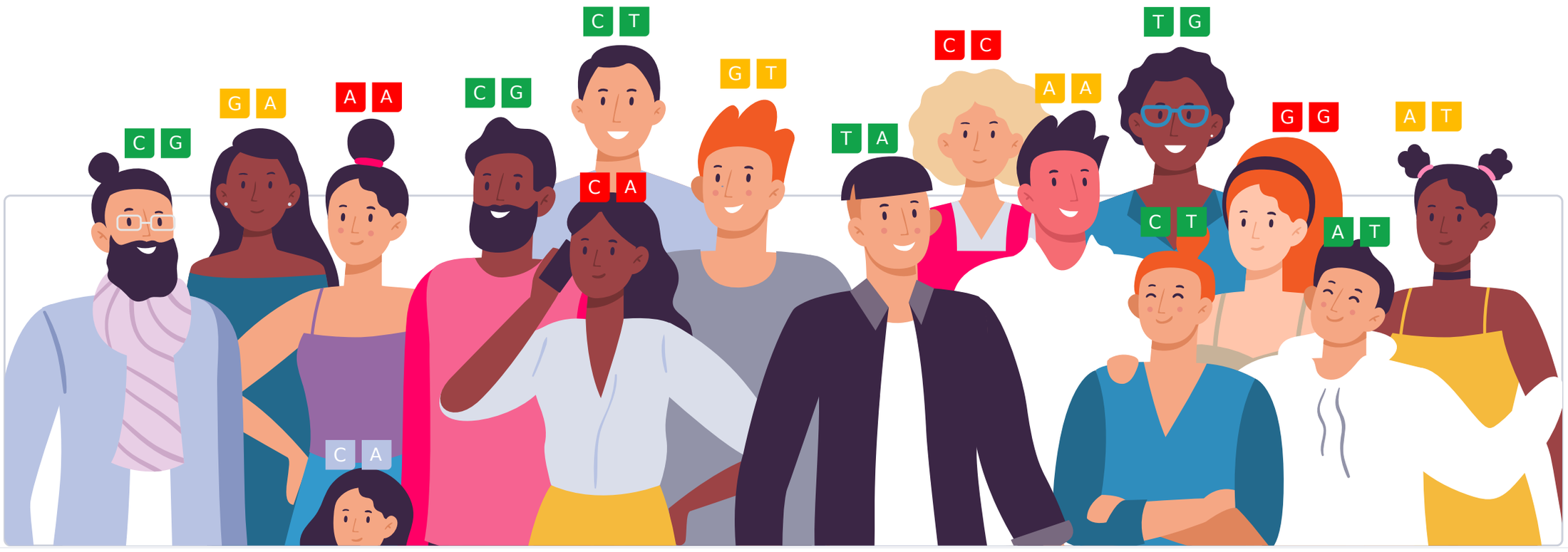
Our Wellness Reports analyze how your DNA influences your health.
We then use this analysis to give you personalized risk estimates and recommendations.

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.

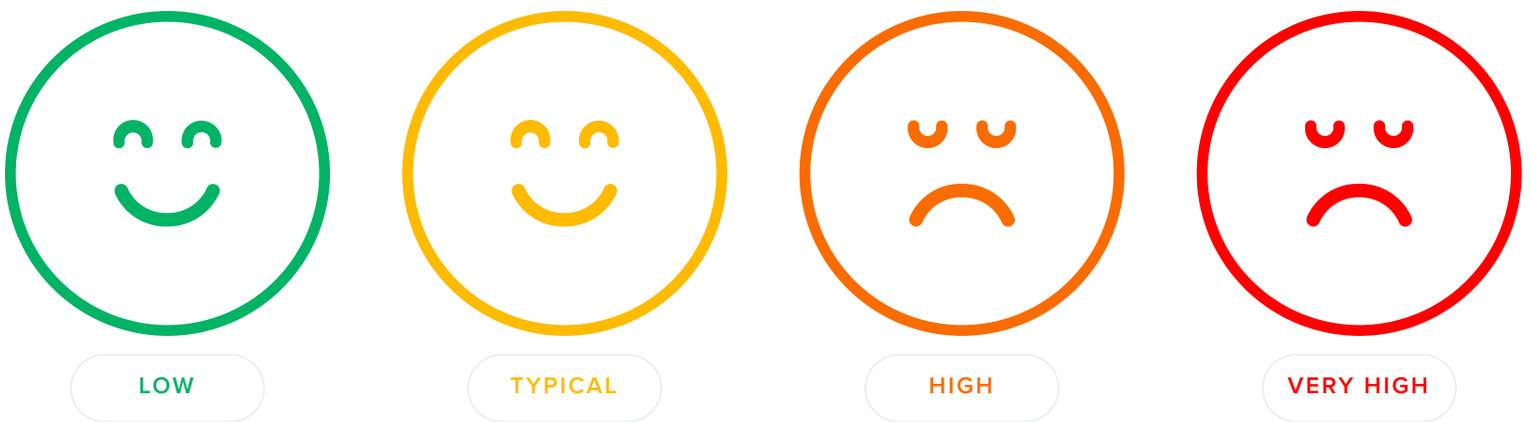
Genetic variants are parts of DNA that differ from person to person. Some can make you more vulnerable to certain health issues, while others may influence traits such as eye color.

Our Summary Reports combine different Wellness and Trait Reports related to a certain health topic. They give you a more complete picture about different aspects of your health and wellness.



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.

When we give a risk score, the risk icon tells you if you are at a higher or lower risk compared to other people:



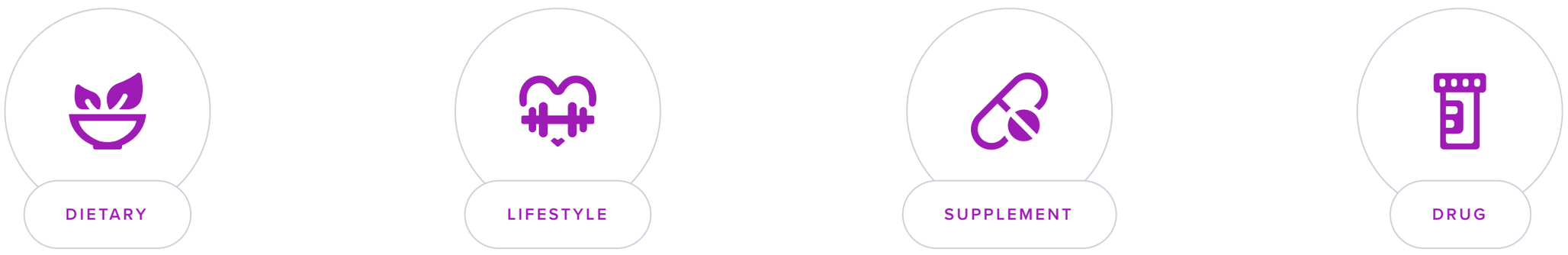
In total, we analyze up to 83 million genetic variants.

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 3 / 5

EVIDENCE 4 / 5

In Summary Reports, we combine top evidence-based recommendations for different conditions.

We focus on recommendations that help with more conditions included in a Summary Report.

For each recommendation, we list all conditions it may help with. We also include impact, evidence, regimen, personalized parts, and other details specific to each condition.

1

Recommendation

Helps with the following

Condition

IMPACT 4 / 5 | EVIDENCE 4 / 5

Condition

IMPACT 4 / 5 | EVIDENCE 4 / 5

Condition

IMPACT 4 / 5 | EVIDENCE 4 / 5

Condition

IMPACT 4 / 5 | EVIDENCE 4 / 5

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, afew 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:

- The scores/gauges use the latest scientific studies. But they are not perfect and will change as the models improve.
- Not everyone with risk variants will develop a health condition.
- Genetics is not the whole story. Your health is most often a combination of genetics, lifestyle, and environmental factors. Great news, as this means that you can often change your lifestyle to lower your risk.
- Results might be more accurate for some ethnic groups than others. This depends on the studies used in each report.
- People without risk variants can also develop health conditions.
- It's important to work with your doctor to better understand your risks. Our reports do not diagnose or treat any health condition. They are not a substitute for medical advice. If you're diagnosed with a certain health condition, follow your doctor's advice.

Summary

Weight management and body fat distribution are influenced by a combination of environmental factors, lifestyle choices, and genetics. **Genetic predispositions** can significantly affect your tendency to gain or lose weight, how your body stores fat, and how efficiently your metabolism operates.

For some, genetic variants may lead to a higher likelihood of weight gain, a slower metabolic rate, or difficulty in maintaining weight loss. For others, genetics may contribute to being underweight or having issues with regulating hunger and satiety.

This report explores the genetic markers associated with weight problems, metabolic function, and fat distribution. By analyzing these genetic factors, the report offers insights into potential challenges related to weight management, including tendencies toward being overweight, weight regain, and metabolic syndrome. It also highlights key markers and genes, such as leptin, ghrelin, and FTO, that play critical roles in regulating hunger, fat storage, and energy balance.

By understanding your genetic predispositions, you can take targeted actions to improve weight management through personalized diet plans, exercise routines, and lifestyle modifications that align with your genetic profile.

This summary report contains:

23 Genetic Results

50 Recommendations

Overview of Your Results

Weight Management

TYPICAL LIKELIHOOD

Overweight

Typical likelihood of being overweight or obese

TYPICAL LIKELIHOOD

Weight Regain

Typical likelihood of weight regain

HIGHER

Tendency to Overeat

Higher predisposition to overeat

LESS LIKELY

Metabolic Syndrome

Less likely to have metabolic syndrome

TYPICAL LIKELIHOOD

Underweight

Typical likelihood of being underweight

Metabolism & Body Composition

TYPICAL

Metabolic Rate

Predisposed to typical metabolic rate

HIGHER LEVELS

Visceral Fat

Predisposed to more visceral fat

TYPICAL LEVELS

Belly Fat

Predisposed to typical amount of belly fat

Weight Markers

HIGHER LEVELS

Leptin

Predisposed to higher leptin levels

TYPICAL LEVELS

Adiponectin

Predisposed to typical adiponectin levels

TYPICAL LEVELS

Ghrelin

Predisposed to typical ghrelin levels

Weight Genes

TYPICAL

FTO (Weight)

Likely typical FTO genetics

INTERMEDIATE ACTIVITY

MC4R (Weight/ Blood Sugar)

Likely intermediate MC4R activity

LOWER ACTIVITY

LEPR (Weight/Leptin Resistance)

Likely lower LEPR activity

LOWER ACTIVITY

UCP1 (Weight)

Likely lower UCP1 activity

LOWER ACTIVITY

UCP2 (Weight)

Likely lower UCP2 activity

LOWER ACTIVITY

UCP3 (Weight)

Likely lower UCP3 activity

WORSE GENETICS

ADRB2 (Weight)

Likely worse ADRB2 genetics

TYPICAL ACTIVITY

ADRB3 (Weight)

Likely typical ADRB3 activity

TYPICAL ACTIVITY

CD36 (Fat Preference/Weight)

Likely typical CD36 activity

LOWER ACTIVITY

CLOCK (Sleep & Weight)

Likely lower CLOCK activity

TYPICAL ACTIVITY

TFAP2B (Weight/Diet)

Likely typical TFAP2B activity

LOWER ACTIVITY

PPARG (Metabolism)

Likely lower PPARG activity

Your Results in Details

Weight Management

Weight issues, such as being overweight, underweight, or having difficulty maintaining weight, are often driven by both lifestyle and genetic factors. This section focuses on the genetic predispositions that may contribute to common weight problems, including tendencies toward overeating, weight regain, and metabolic syndrome.

Understanding your genetic risk factors can help you tailor your diet, exercise routine, and weight management strategies to better suit your body's unique needs. By addressing these predispositions early, you can work toward achieving a healthy weight and maintaining long-term weight stability.

TYPICAL LIKELIHOOD

Overweight

Typical likelihood of being overweight or obese

TYPICAL LIKELIHOOD

Weight Regain

Typical likelihood of weight regain

HIGHER

Tendency to Overeat

Higher predisposition to overeat

LESS LIKELY

Metabolic Syndrome

Less likely to have metabolic syndrome

TYPICAL LIKELIHOOD

Underweight

Typical likelihood of being underweight

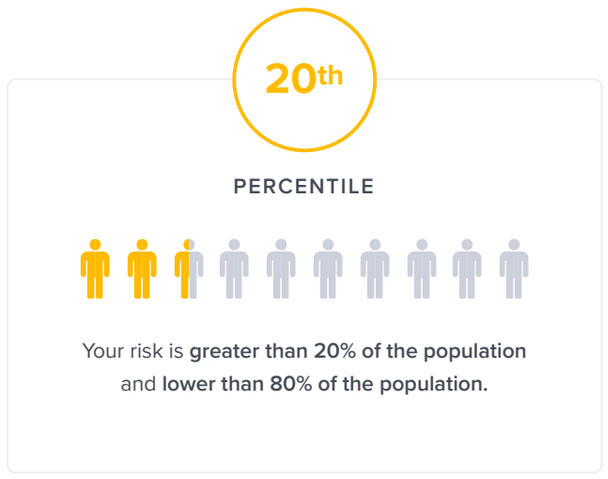
Overweight

Key Takeaways:

- Up to **70%** of people's differences in weight may be due to genetics.
- Up to **42% of adults** and **19% of children** in the US meet the medical criteria for obesity.
- Weight gain affects conditions like high blood sugar and heart disease. However, it is highly modifiable by diet and exercise. So, even if your genetic risk is high, there's a lot you can do to reduce its impact.
- Click the **Recommendations** tab for useful weight control tips and **next steps** for relevant labs.

TYPICAL LIKELIHOOD

Typical likelihood of being overweight or obese based on 455,505 genetic variants we looked at



People are finding it harder than ever to manage their weight. **Global obesity rates have skyrocketed** [R, R, R].

Some health experts even say we're in an "obesity epidemic." **Up to 42% of adults and 19% of children in the US meet the medical criteria for obesity** [R, R, R].

Doctors can use *body mass index* (BMI) to tell if someone is obese. To calculate your BMI, divide your weight by the square of your height (kg/m^2). There are many online calculators that can help you do this [R, R].

In Western countries, people with a **BMI of 25 and over** are considered **overweight**. A **BMI of 30 or greater** is considered **obese**. In some Asian countries, a BMI of 25 and over is considered obese [R, R, R].

BMI isn't the only important measure of healthy weight, however. Body composition is also important because muscle is more dense than fat. Thus, a muscular athlete and an obese person can have similar BMIs [R, R].

For this reason, doctors and researchers often use other body weight measurements, including [R, R]:

- Waist circumference (WC)
- Waist-to-hip ratio (WHR)
- Percentage of body fat (%BF)
- Lean (muscle) mass

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FTO	rs9939609	AT
NPC1	rs1808579	CC
NPC1	rs1805081	TT
MC4R	rs17782313	CT
GNPDA2	rs10938397	AG
SH2B1	rs7498665	GA
SEC16B	rs591120	CG
KCTD15	rs29941	AG
NEGR1	rs3101336	TC
IL6R	rs2229238	TT
STEAP1B	rs10242595	GG
LEP	rs4731426	CG
STEAP1B	rs1800795	GC
SOCS3	rs9892622	AA
PGS1	rs4969170	AA
UCP2	rs2075577	GG
CNTF	rs1800169	GA
UCP2	rs647126	AA
LEPR	rs1137100	AA
LEPR	rs1137101	GG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Some people worry about body weight because they value how they look. However, **body weight impacts both mental and physical health**. Obesity may increase the risk of [R, R]:

- High blood pressure
- High cholesterol
- Heart disease
- High blood sugar
- Reproductive issues and erectile dysfunction
- Breathing problems during sleep
- Joint and bone disorders
- Some cancers

In theory, you gain weight when you consume more calories than you burn. Your body stores the extra energy as fat [R, R, R].

In reality, it's more complicated than that. To stick to a healthy weight, you'll need to manage many factors, including [R, R, R]:

- **Diet**. Pay attention to the amount and type of food you eat, meal timing, and portion size.
- **Lifestyle**. It's better to live an "active" lifestyle than a "sedentary" one and to allow your body to get the sleep it needs.
- **Environment**. What are your family habits? Do you have social support? What is your stress level? These things have a surprising effect on weight management.
- **Medical conditions**. Anything that changes your metabolism or ability to exercise can also affect body weight.
- **Genetics**. Some gene variants may make it easier or harder to manage your weight.

Doctors may recommend a variety of strategies to help reach and maintain a healthy weight. These include [R]:

- Reducing how much food you eat
- Choosing low-calorie foods
- Choosing more plant-based foods
- Exercising
- Counseling or support groups

Your genes may help determine how well you respond to these strategies.

Rarely, obesity can become a serious health problem. In these cases, doctors may prescribe weight loss drugs or surgery [R].

Up to 70% of differences in weight may be attributed to genetics. Genes that may contribute to body weight influence [R, R, R, R, R, R, R, R, R]:

- Food choices (*FTO*, *IRX4*)
- Appetite (*LEP*, *POMC*, *MC4R*, *NPY*)
- Meal timing (*CLOCK*)

- Fat and sugar metabolism (*FTO*, *UCP2*, *TCF7L2*)

Genetically high bioavailable testosterone may be causally associated with a high risk of obesity (in women). In contrast, genetically high choline, omega-3 fatty acids, and DHA may be causally associated with a lower risk of obesity [R, R].

Weight Regain

A lot of people who are overweight focus on losing weight by dieting or exercising. However, many people who have lost weight while on a diet will tell you it's hard to keep the weight off once the diet is over. In fact, it's very common to regain up to 50% of weight lost within a year after losing it [R]!

Different people may find it easier or harder to keep the weight off. Some of those differences may be genetic.

Genes linked to weight regain may influence [R, R, R, R, R, R, R]:

- The way fat is stored in the body
- Inflammation
- Feelings of hunger
- Feelings of reward from eating food

TYPICAL LIKELIHOOD

Typical likelihood of weight regain based on 54 genetic variants we looked at

48th

PERCENTILE

Your risk is **greater than 48% of the population** and **lower than 52% of the population.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
BDNF	rs6265	CC
ALOX5AP	rs4769873	CC
ALOX5AP	rs9578196	CC
ALOX5AP	rs9315051	AA
LEP	rs2071045	TT
FTO	rs9939609	AT
LEP	rs4731426	CG
PPARG	rs1801282	GC
TUB	rs4385931	GG
ALOX5AP	rs3885907	CC
APP	rs2830054	TT
TFAP2B	rs987237	AA
CCK	rs10865918	AC
APP	rs466448	AG
CCK	rs11571842	TC
PPARGC1A	rs2932976	GA
FAM241A	rs17044137	AT
PEX11A	rs894160	CT
ANKK1	rs1800497	AG
KCTD15	rs29941	AG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Tendency To Overeat

Genetics may play a role in how often you feel hungry. One related gene is *FTO*, known as fat mass and obesity-associated gene [R].

A variant near this gene is associated with:

- Increased appetite [R, R]
- Higher food intake [R, R]
- Feeling less full after meals [R, R, R]
- Eating in the absence of hunger [R, R]
- Food cravings and emotional eating [R, R]

It is important to remember that a number of other gene variants may also influence hunger. Additionally, lifestyle and environmental factors play an important role in appetite control and how much we eat.

Some choices that may help you eat less include [R, R, R, R, R]:

- Only eating when physically hungry
- Drinking more water
- Eating more protein
- Replacing sugary snacks with more filling foods

HIGHER

Higher predisposition to overeat based on 1 genetic variant we looked at

63%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **63% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FTO	rs9939609	AT

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Metabolic Syndrome

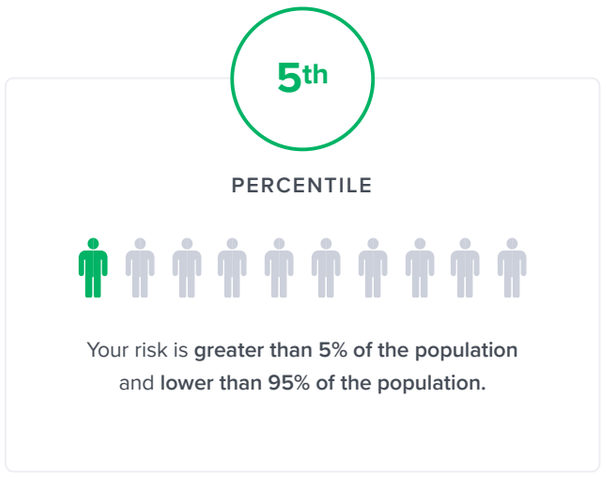
Factors that might increase the risk of developing metabolic syndrome include:

- Age: Risk increases with age.
- Obesity, particularly abdominal obesity.
- Insulin resistance.
- A history of diabetes in one's family.
- A history of gestational diabetes or having given birth to a baby weighing more than 9 pounds.
- Other diseases: A history of nonalcoholic fatty liver disease, polycystic ovary syndrome, or having had a cardiovascular disease or stroke.
- Hormonal imbalance, like low testosterone in men.
- Lack of physical activity.
- An unhealthy diet high in fats and sugars.
- Genetics

Genetics plays a significant role in metabolic syndrome. Specific genetic factors might make certain individuals more susceptible to the conditions that contribute to metabolic syndrome. Family history, particularly if parents or siblings have had diabetes, heart disease, or a stroke, can be an indicator of increased risk.

LESS LIKELY

Less likely to have metabolic syndrome based on 636,870 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CLPTM1	rs483082	TT
MLXIPL	rs12056034	AG
GALNT2	rs2281721	TC
FADS2	rs1535	GA
FTO	rs56094641	GA
MC4R	rs66922415	GA
PABPC4	rs11206374	AG
CMIP	rs2925979	CT
GCKR	rs1260326	TC
KLF14	rs10260148	CT
LIN7C	rs56133711	GA
NAT2	rs4921913	CT
SNX10	rs1534696	AC
INO80E	rs3814883	CT
GSR	rs10954772	CT
RPL17	rs1105654	GA
TRPS1	rs3808439	AG
HLA-DQA2	rs5021727	AG
NCKAP5L	rs7138803	GA
MLLT10	rs9971210	CG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Underweight

There are a variety of reasons why a person may be underweight. Sometimes, multiple underlying causes may be related. Causes of being underweight include:

- Dietary restrictions or lack of access to nutritious foods.
- High physical activity level.
- Medical conditions that accelerate metabolism, decrease appetite, or cause vomiting such as thyroid disorders, diabetes, cancer, or digestive diseases.
- Mental health issues that affect appetite and body image such as depression, anxiety, or eating disorders like anorexia nervosa and bulimia.

Genetics can play a role in determining your natural body type and metabolism. People with a family history of being naturally thin or underweight might have a higher tendency to be underweight themselves [R].

It is best to see your healthcare provider if you lose weight unexpectedly. Your provider or a dietitian can help you develop a plan to gain weight in a healthy way. The plan should include [R]:

- Eating regular snacks (5 to 6 smaller meals during the day) with a focus on proteins, carbohydrates, and healthy fats.
- Adding extras to your dishes for more calories, focusing on nutrient-rich and calorie-dense foods.
- Trying smoothies and shakes with a blend of high-calorie, nutritious ingredients. Meal replacement drinks may also be part of your weight-gain effort.
- Watching what and when you drink. Drinking enough throughout the day is important but beverages can make you feel full. If that's the case for you, avoid drinking during a meal or before.
- Exercise, especially strength training, to help you gain weight by building up your muscles and stimulating your appetite.

TYPICAL LIKELIHOOD

Typical likelihood of being underweight based on 1,665 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ANK2	rs7656666	AA
/	rs6833159	TC
NRXN3	rs12882679	GA
ADGRB3	rs117763955	CC
PCGF2	rs118080693	CC
DPF3	rs17180754	GG
DCC	rs35721894	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Metabolism & Body Composition

Metabolism and body composition play crucial roles in how your body processes energy, stores fat, and maintains weight. Factors like **metabolic rate, visceral fat, and belly fat** are influenced by both genetics and lifestyle.

By identifying your genetic predisposition to metabolic rate and fat distribution, you can make informed decisions about your diet, exercise, and strategies to optimize body composition and metabolic health.

TYPICAL

Metabolic Rate

Predisposed to typical metabolic rate

HIGHER LEVELS

Visceral Fat

Predisposed to more visceral fat

TYPICAL LEVELS

Belly Fat

Predisposed to typical amount of belly fat

Metabolic Rate

Key Takeaways:

- Being high or low metabolism is not inherently problematic. Knowing what yours is allows you to adjust various diet, exercise, and lifestyle choices to properly manage it.
- Your metabolic rate influences movement, thinking, breathing, body temperature, and healing rate.
- High metabolic rate may be affected by being younger, being bigger, as well as more active. Low metabolic rate tends to be affected by the opposite of these. Your genetics may impact the influence of these factors.

Your metabolic rate is the number of calories you burn in a day to maintain bodily functions. A lower metabolic rate or a "slower metabolism" means your body needs fewer calories to do basic functions. Others may need to burn more calories to support these functions. These people have a higher metabolic rate or a "faster metabolism" [R,R,R].

Is metabolism related to body weight? If so, is it possible to burn more calories by boosting your metabolic rate?

Differences in metabolic rate may be due to both genetic and environmental factors. Factors that can contribute to a slower metabolism include [R, R, R, R, R]:

- Being smaller
- Having less muscle mass
- Being older
- Being less active
- Not getting enough sleep

People with slower metabolism need fewer calories to get them through the day. They also tend to gain weight more easily.

Factors that can contribute to a faster metabolism include [R, R, R, R]:

- Being larger
- Having more muscle mass
- Being younger
- Being more active

People with faster metabolism need more calories to get them through the day. They also find it harder to gain weight.

Metabolic rate may not change much from age 20 to 60. While you may not change how many calories your body needs to perform

TYPICAL

Predisposed to typical metabolic rate based on 137,802 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CCND2	rs76895963	TT
TP53	rs78378222	TT
CCND3	rs33966734	CA
PARD3B	rs1470545	CC
DCAF16	rs1472852	AA
L3MBTL3	rs7740107	AA
DLEU7	rs3118914	GT
HMGA2	rs1351394	CT
ZFHX4	rs61729527	TC
MGA	rs117183161	AA
MC4R	rs76227980	CC
SH3YL1	rs62106258	TT
ZBTB26	rs369508364	CC
CDKN1C	rs143840904	CC
FANCC	rs370727606	GG
ACAN	rs28584580	AA
PAM	rs78408340	CC
ADAMTS10	rs62621197	CC
DLG5	rs117543413	CC
COQ5	rs76929617	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

automatic functions, **you can burn more calories by being more active**. Regular exercise can help maintain a healthy weight and support overall health [R, R, R, R, R].

If you're concerned about your weight or you think your metabolism is too slow or too fast, talk with your doctor.

Visceral Fat

Key Takeaways:

- About 40% of the differences in levels of visceral fat may be due to genetic factors
- High visceral fat levels have been related to high blood pressure, heart disease, and type 2 diabetes.
- Risk factors include a diet high in saturated fat and sugar, a lack of physical activity, stress, aging, and menopause.
- If your genetic risk is high or you have a low risk but more visceral fat than you want, take action on factors that you can change.

If we asked you to picture body fat, the first thing that would likely come to mind is *subcutaneous fat*. This fat is found under the skin of the belly, thighs, and other areas. However, there is another type of body fat called *visceral fat*. This type of body fat hides in the abdomen and surrounds organs like the liver, stomach, and intestines. It may have a greater impact on health than subcutaneous fat [R, R].

Factors that may increase the amount of visceral fat include [R, R, R, R]:

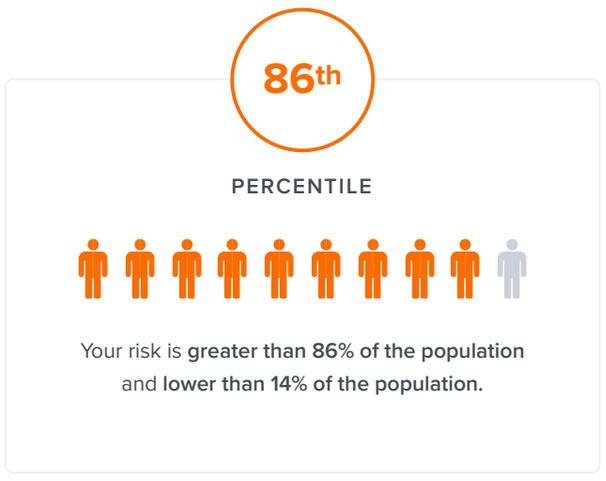
- A diet high in saturated fat and added sugar
- A lack of physical activity
- Long-term stress
- Aging
- Menopause
- **Genetics**

In fact, **about 40% of the differences in levels of visceral fat may be due to genetic factors** [R].

For example, genetically high bioavailable testosterone may be causally associated with lower hip circumference in men and genetically high free testosterone may be causally associated with lower body fat [R, R].

HIGHER LEVELS

Predisposed to more visceral fat based on 818,294 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MC4R	rs2229616	CC
SH3YL1	rs62106258	TT
ADH1B	rs1229984	CC
ADARB1	rs76040172	GG
FTO	rs56094641	GA
UHRF1BP1	rs9469899	AA
MC4R	rs538656	TG
SEC16B	rs539515	CA
/	rs114593013	GA
KCNH5	rs79733879	TC
LIN7C	rs11030112	GA
MEF2C	rs2304608	CA
GNPDA2	rs10938398	GA
SH2B1	rs7498665	GA
NCKAP5L	rs7132908	GA
PPARG	rs7649970	TC
LRFN2	rs9471333	TC
RSPO3	rs9482772	TC
GSTM4	rs7550711	CC
SH3YL1	rs13393304	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

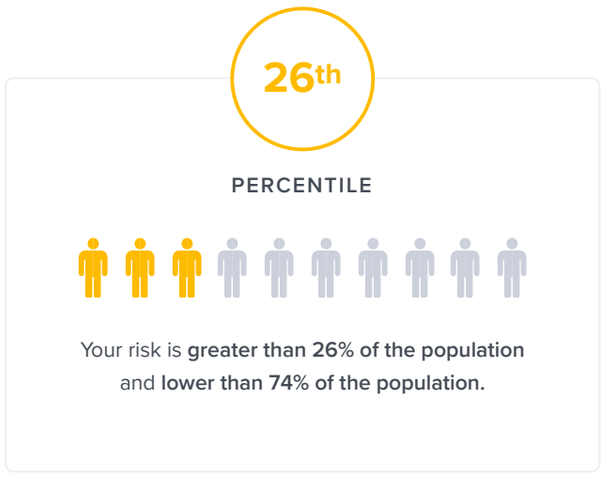
Belly Fat

Factors that might contribute to the accumulation of belly fat include:

- Genetics: some people may be genetically predisposed to accumulate fat in the abdominal area. Specific variants can influence body fat distribution, metabolism, and response to exercise and diet.
- Age: As people age, they tend to gain more abdominal fat.
- Diet: High intake of sugary foods, beverages, and high-fat foods can promote abdominal fat.
- Lack of physical activity: Sedentary lifestyles can lead to weight gain and increased belly fat.
- Poor sleep: Lack of sleep or poor-quality sleep may result in weight gain, including in the abdominal area.
- Stress: Chronic stress can lead to weight gain, especially around the midsection due to increased cortisol levels.
- Hormonal changes: Conditions like PCOS (polycystic ovary syndrome) or hormonal shifts during menopause can lead to an increase in belly fat.

TYPICAL LEVELS

Predisposed to typical amount of belly fat based on 728,984 genetic variants we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PAX7	rs140068450	GG
KCNIP4	rs191089506	AA
EPHA4	rs151197313	GG
DACT3	rs115034159	CC
SPTBN1	rs149660479	TT
NDUFAF1	rs144284546	CC
/	rs141736521	GG
KIAA1217	rs143713405	GG
SPTBN1	rs139247782	CC
/	rs57914885	TT
IL1RAP	rs73184209	TT
/	rs149272992	CC
SFRP1	rs138170590	GG
CHRM2	rs187398437	TT
SH3RF2	rs186498547	CC
FUT9	rs116997611	TT
DNAJC13	rs61748103	GG
INPP4B	rs183291101	GG
CHMP4B	rs150618140	CC
SLC48A1	rs149188661	CC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Weight Markers

Hormones like **leptin, adiponectin, and ghrelin** are key regulators of hunger, satiety, and fat metabolism. These hormones play an essential role in weight management by signaling when you're full, regulating fat storage, and controlling appetite. This section explores how genetic variations in these hormones can influence your weight and body fat.

By understanding your genetic predisposition to these weight hormones, you can adjust your diet and lifestyle to better manage hunger and improve your body's ability to maintain a healthy weight.

HIGHER LEVELS

Leptin

Predisposed to higher leptin levels

TYPICAL LEVELS

Adiponectin

Predisposed to typical adiponectin levels

TYPICAL LEVELS

Ghrelin

Predisposed to typical ghrelin levels

Leptin

Low leptin levels have been associated with:

- Low body mass index (BMI) [R, R]
- Cold exposure [R]
- Alcohol [R]
- Exercise [R, R]
- Short-term fasting [R]
- Sleep deprivation [R]
- Anorexia [R]

Leptin deficiency can also be caused by disorders such as:

- Congenital leptin deficiency [R]
- Congenital and acquired lipoatrophy (localized loss of fat tissue) [R]

Symptoms of low leptin levels vary depending on the underlying cause and may include [R, R, R, R]:

- Feeling hungry more often
- Difficulty losing weight (slower metabolism)
- High or low percentage of body fat
- Absent period (in women)
- Weak and brittle bones (osteoporosis)
- Frequent infections

In contrast, the following have been associated with elevated leptin levels:

- Overeating, especially high-fat and high-sugar foods [R, R]
- Emotional stress [R]
- Inflammation [R, R]
- Obesity [R]
- Pregnancy [R]
- Pre-eclampsia [R]
- Gestational diabetes [R]
- Sleep apnea [R]

Chronically high leptin levels can lead to leptin resistance. Symptoms of leptin resistance include [R]:

- Weight gain and difficulty losing weight
- Urge to snack soon after meals

Leptin resistance is associated with obesity, metabolic syndrome, and other related health issues like type 2 diabetes and cardiovascular diseases.

Maintaining healthy leptin levels primarily involves a balanced diet, regular physical activity, adequate sleep, and stress management. For

HIGHER LEVELS

Predisposed to higher leptin levels based on 2,670 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LEP	rs10487505	GG
KLF14	rs972283	GG
ARHGAP40	rs6071166	CC
SLC38A11	rs13389219	CT
TIPARP	rs900400	CT
GCKR	rs780093	TC
GCKR	rs1260326	TC
TIPARP	rs900399	GA
KLHL31	rs3799260	TC
SLC38A11	rs6738627	GA
LEP	rs17151919	GG
ZNF800	rs62621812	GG
LEP	rs791600	GG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

individuals struggling with weight or metabolic health, consulting with a healthcare provider is crucial. They can offer guidance on diet, exercise, and lifestyle adjustments to improve leptin sensitivity and overall health.

Adiponectin

Whether low adiponectin levels actually *cause* these conditions or are just a biomarker for their onset and progression remains unknown, but the production of this hormone is reduced in people with [R, R, R, R, R]:

- Obesity
- Heart disease
- Diabetes
- Asthma
- Preterm birth
- Sleep deprivation

Conversely, high adiponectin levels have been associated with [R, R, R, R, R, R]:

- Autoimmune diseases such as rheumatoid arthritis, osteoarthritis, and lupus
- Heart failure and high blood pressure
- Kidney disease
- Aging
- Calorie restriction

Therefore, focusing on improving your adiponectin levels is unlikely to improve your health. However, some beneficial steps you can take to improve your overall health will likely increase your adiponectin levels. These steps include:

- Losing weight if you are overweight [R]
- Regular exercise [R, R]
- Eating a healthy, balanced, diet rich in unsaturated fats such as olive oil [R, R, R]
- Taking cold showers [R]

Foods, beverages, and supplements that may increase adiponectin levels include:

- Banana [R]
- Berries such as grapes and raspberries [R, R]
- Coffee [R]
- Coenzyme Q10 [R]

TYPICAL LEVELS

Predisposed to typical adiponectin levels based on 37 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
WDR11	rs10886863	CC
ITIH1	rs1108842	AA
RGMA	rs4777845	TT
RFC4	rs182052	AA
ACADVL	rs222852	AA
PDE3A	rs11045172	AA
/	rs4716055	TT
TCTN2	rs6488898	AG
IRS1	rs1515110	GT
CMIP	rs2925979	CT
DVL2	rs507506	GG
HCAR2	rs601339	GA
PDE3A	rs7955516	AA
CITED2	rs668459	CC
RBMS2	rs2657888	GG
ZNF664	rs7978610	CG
ARL15	rs6450176	AG
TMEM263	rs10778506	TC
LYPLAL1	rs2061155	TC
FAM13A	rs13131633	TC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Ghrelin

Ghrelin is a hormone mainly produced by the stomach. Ghrelin is considered the “hunger hormone” because it stimulates appetite, promotes eating, and increases fat storage. It also plays important roles in immunity, muscle growth, and brain health [R, R, R, R].

Genetics may influence ghrelin levels. For example, variants of the *GHRL* gene, which helps produce ghrelin, are linked to lower ghrelin levels [R].

Several other factors may change ghrelin levels, including [R, R, R, R]:

- **Time of the day:** Ghrelin levels are higher at night and lower during the day
- **Food intake:** Ghrelin is highest when the stomach is empty and lowest after a meal
- **Type of meals:** Carbohydrate-rich meals lower ghrelin levels the most, followed by fat-rich meals and high-protein meals

Although counterintuitive, **obese people may have lower levels of hunger hormone** than lean people. However, after a meal, ghrelin levels in obese people seem to drop less, which may keep them hungry. Research on this matter is still ongoing [R, R, R, R].

Other health conditions linked to **low ghrelin levels** include:

- Type 2 diabetes [R]
- Hyperthyroidism (overactive thyroid) [R]
- Gastritis due to *Helicobacter pylori* infection [R]
- Stomach surgery [R, R]

High ghrelin levels may result from sleep deprivation and chronic stress. People with **anorexia may also have high levels of hunger hormone** but be less sensitive to it than healthy people. Other health conditions linked to high ghrelin levels include [R, R, R, R, R]:

- Lung disease [R]
- Rare genetic disorders [R]

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 LEVELS

Predisposed to typical ghrelin levels based on 12 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CNTNAP2	rs192092592	AA
ALX4	rs143653572	CC
MAF	rs76823993	CC
PAX5	rs138296128	CC
BANK1	rs142224718	TT
BRINP1	rs139359241	GG
EPDR1	rs74483218	GG
BRK1	rs143729751	GG
TRMT6	rs187860960	CC
AKT3	rs112426408	AA
AKT3	rs80240706	CC
/	rs77563704	CC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

Weight Genes

Several genes have been identified as playing a major role in weight regulation, metabolism, and fat storage. This section covers key genes like ***FTO***, ***MC4R***, and ***LEPR***, which influence weight, blood sugar levels, and the body's response to hormones like leptin. Other genes, such as ***UCP1***, ***UCP2***, and ***ADRB3***, regulate energy expenditure and fat metabolism.

Understanding your genetic predisposition through these genes can guide you in developing a personalized weight management plan, focusing on strategies that align with your genetic strengths and challenges for better long-term results.

TYPICAL

FTO (Weight)

Likely typical FTO genetics

INTERMEDIATE ACTIVITY

MC4R (Weight/ Blood Sugar)

Likely intermediate MC4R activity

LOWER ACTIVITY

LEPR (Weight/Leptin Resistance)

Likely lower LEPR activity

LOWER ACTIVITY

UCP1 (Weight)

Likely lower UCP1 activity

LOWER ACTIVITY

UCP2 (Weight)

Likely lower UCP2 activity

LOWER ACTIVITY

UCP3 (Weight)

Likely lower UCP3 activity

WORSE GENETICS

ADRB2 (Weight)

Likely worse ADRB2 genetics

TYPICAL ACTIVITY

ADRB3 (Weight)

Likely typical ADRB3 activity

TYPICAL ACTIVITY

CD36 (Fat Preference/Weight)

Likely typical CD36 activity

LOWER ACTIVITY

CLOCK (Sleep & Weight)

Likely lower CLOCK activity

TYPICAL ACTIVITY

TFAP2B (Weight/Diet)

Likely typical TFAP2B activity

LOWER ACTIVITY

PPARG (Metabolism)

Likely lower PPARG activity

FTO (Weight)

An SNP in this gene, rs9939609, has shown a robust association with obesity across different ages and ethnic groups. Carriers of the minor 'A' allele tend to gain more weight and have higher rates of obesity [R, R, R, R].

Many human studies suggest that the 'A' allele at rs9939609 is associated with:

- Higher levels of *ghrelin* or the "hunger hormone" [R]
- Higher food intake [R, R, R]
- Increased preference for higher-calorie foods [R, R, R]
- Increased enjoyment of food [R]
- Not feeling full after meals [R, R, R]
- Eating in the absence of hunger [R, R]
- Food cravings [R]
- Emotional and binge eating [R]

In contrast, the 'T' allele is linked to normal body weight, more satiety after meals, and possibly healthier dietary choices [R, R, R].

In addition to its potential influence on appetite and hunger control, this *FTO* SNP may also have metabolic effects that affect how the body actually processes the food we eat. For example, several studies suggest that the 'A' allele of rs9939609 may be linked with higher insulin resistance and blood sugar [R, R, R, R].

Following on this, a meta-analysis of data from over 40,000 Scandinavians found that people diagnosed with type-2 diabetes were more likely to carry the 'A' allele for this SNP. The authors also concluded that having the 'A' allele may make a person more likely to develop type-2 diabetes over time. However, another meta-analysis of over 150,000 people found this association significant only in some populations [R, R].

The good news is that **healthy dietary choices may reduce and even cancel out the harmful effects of the 'A' variant!**

Multiple studies have associated an increased intake of dietary fat, specifically saturated and trans fat, with obesity in carriers of the 'A' allele [R, R, R, R, R, R, R].

Carriers of this variant eating a low-fat diet or replacing saturated fat with healthy fats such as PUFA and MUFA may see greater reductions in [R, R, R, R, R]:

- Weight and abdominal fat
- Total cholesterol

TYPICAL

Likely typical FTO genetics based on 1 genetic variant we looked at

43%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **43% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
FTO	rs9939609	AT

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

- LDL
- CRP (inflammation)
- Insulin resistance

Additionally, carriers of the ‘A’ variant may benefit from increasing their intake of dietary protein. While a low-protein diet has been associated with higher BMI and waist circumference in people with the ‘AA’ genotype, ‘A’ carriers eating a high-protein diet may see greater improvements in their [R, R, R]:

- Appetite and food craving control
- Total cholesterol
- Triglycerides
- LDL
- Insulin resistance

However, two meta-analyses failed to confirm these associations. One of them even came to the opposite conclusion: the link between FTO variants and BMI was **stronger** in those who consumed more protein. Further analysis of different populations confirmed this finding only in whites [R, R].

A 3-year-long study concluded that people with the 'AA' genotype may lose weight better on a Mediterranean diet compared to people with the ‘TT’ genotype. In addition, according to another study, this type of diet may protect people with the 'AA' genotype against diabetes [R, R].

MC4R (Weight/ Blood Sugar)

The most studied SNP near the *MC4R* gene is **rs17782313**. The **"C" allele** is linked to:

- Higher BMI (8%) and obesity rates (12-30%) [R, R]
- Increased hunger, snacking, and overeating [R]
- Eating high-calorie foods high in fat [R, R]

Another important *MC4R* variant is **rs12970134**. The **“A” allele** is linked to:

- Obesity, higher BMI, and waist circumference [R, R, R]
- Food cravings and increased beverage consumption [R]
- High blood sugar and insulin resistance [R, R, R, R]

Other *MC4R* variants like **rs6567160** and **rs663129** have shown similar associations, They are almost always inherited together with the two main variants, so they all represent a single genetic factor [R, R, R, R, R].

“Bad” *MC4R* variants likely **reduce gene expression or receptor activity**, thus increasing food intake and hindering glucose and fat metabolism.

Learn more about the link between MC4R variants, weight, and food intake.

Learn more about the link between MC4R variants and blood sugar.

INTERMEDIATE ACTIVITY

Likely intermediate MC4R activity based on 2 genetic variants we looked at

35%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **35% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
MC4R	rs17782313	CT
MC4R	rs12970134	AG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

LEPR (Weight/Leptin Resistance)

Many *LEPR* variants are currently under investigation for their possible link to leptin resistance and obesity. The most important one is **rs1137101**.

At rs1137101, the 'GG' genotype is associated with higher weight, higher BMI, and increased daily intake of calories. People with the 'GG' genotype at rs1137101 are also likely to have higher cholesterol, higher blood sugar, and insulin resistance [R].

A recent meta-analysis has confirmed a link between this variant and obesity. The risk was **19% higher per each "G" allele** [R].

This variant likely reduces the number or activity of leptin receptors, potentially contributing to leptin resistance [R, R].

Studies have linked another variant, **rs12405556-T**, to higher weight and blood lipid levels. This variant is often inherited together with rs1137101-G, meaning many people carry either both or none of them [R].

Other LEPR SNPs—like rs1137100, rs11208659, and rs11804091—have been linked to weight gain and obesity as well. However, the supporting evidence is weaker [R, R].

LOWER ACTIVITY

Likely lower LEPR activity based on 1 genetic variant we looked at

24%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **24% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
LEPR	rs1137101	GG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

UCP1 (Weight)

One of the best-studied SNPs in the *UCP1* gene is rs1800592 (also known as the “-3826 A>G” polymorphism). It helps determine how your body uses and stores the energy that you get from food [R].

The 'T' allele is linked to increased activity of the *UCP1* gene. It's associated with a higher resting metabolic rate, higher body heat production, and less weight gain. According to some researchers, this variant helps turn more of the energy from food into heat instead of body fat (white fat) [R, R].

Conversely, the 'C' allele is linked to *decreased* activity of the *UCP1* gene. It's associated with a lower resting metabolic rate, lower body heat production, higher weight gain, and a higher BMI. If less of the energy acquired from food is turned into heat, then more of it would get stored as body fat [R, R].

According to several studies, the 'C' allele (and especially the 'CC' genotype) is associated with increased weight gain as well as a higher chance of being obese [R, R, R, R, R, R, R, R].

For example, people with the 'CC' genotype were found to have lower basal metabolic rates than people with the ‘T’ allele. In other words, they burned less energy when resting. In fact, one study reported that 'C' carriers may burn as much as 200 fewer calories per day than people with the 'TT' genotype [R, R]!

Apart from burning less energy when resting, people with the 'CC' genotype also produced less heat when exposed to cold [R, R].

We all lose brown fat as we age. However, in one study, people with the 'CC' genotype had less brown fat at a younger age than people with the ‘T’ allele [R].

Several studies link the 'C' allele and the 'CC' genotype to metabolic disturbances commonly associated with being overweight. In various studies, the ‘C’ allele has been associated with elevated blood pressure, greater insulin resistance, and higher LDL cholesterol and triglycerides [R, R, R, R, R, R].

Fun fact: worldwide, about 30% of people have the 'TT' genotype, which is associated with higher resting metabolism and increased heat production. But this genotype is much more frequent in Europe, where 58% of people have it! Many researchers believe that the *UCP1* gene and the rs1800592 SNP are in part responsible for human adaptation to colder climates [R].

LOWER ACTIVITY

Likely lower UCP1 activity based on 1 genetic variant we looked at

42%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **42% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CLGN	rs1800592	CT

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

However, although today we consider the 'T' allele beneficial in terms of its potential effect on body weight, this allele is essentially linked to lower metabolic efficiency. In other words, people with this allele may “waste” more of the energy that they get from food on generating body heat. It is plausible that the more efficient 'C' allele may be advantageous when food is scarce and the climate is warm [R].

UCP2 (Weight)

The minor ‘T’ variant of the rs659366 increases *UCP2* expression in the fatty tissue, pancreas, and liver [R, R, R].

This allele showed a protective effect from obesity in studies on Austrian and Iranian adults, and Turkish children. Similarly, the major ‘C’ allele was associated with obesity in Danish and Egyptian adults, and Korean, Hungarian, and Spanish children [R, R, R, R, R, R, R, R].

However, no association between this polymorphism and obesity was found in some studies on Danish and Italian adults, and German children. The ‘T’ variant was even associated with *increased* obesity rates and body fat in Danish, Egyptian, Russian, Spanish, Mexican, Balinese, Indonesian, and Indian adults, and Spanish children [R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R, R].

Despite these discrepancies, all meta-analyses agree that the ‘T’ variant is associated with lower obesity rates and BMI in European but not in Asian populations [R, R, R, R].

However, this variant may have negative effects on blood lipids, glucose control, and diabetic outcomes [R, R, R, R, R, R, R, R, R].

Another variant usually inherited with this one (‘A’ at rs660339) has been associated with obesity in Asians but seems to have the opposite effect in Europeans [R, R, R].

LOWER ACTIVITY

Likely lower UCP2 activity based on 1 genetic variant we looked at

33%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **33% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
UCP2	rs659366	CC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

UCP3 (Weight)

The most widely-investigated *UCP3* polymorphism by far is rs1800849, also known as -55C/T. A study in Pima Indians found that the minor allele 'A' increases *UCP3* expression, and possibly the levels of the protein, in the muscles [R].

Some studies suggest that the minor variant at this polymorphism may protect from obesity, especially in Caucasians. The mixed results observed may be due to differences in the diet, physical activity, and genetic background of the different populations. Importantly, different *UPC2* and *UPC3* variants are inherited together and their combinations may influence their effects on weight [R, R, R, R].

This variant has been associated with a higher waist circumference, waist to hip ratio, and abdominal fat in multiple populations. However, a Spanish study found no relationship between this polymorphism and fat mass or distribution in obese. Another study on American women associated it with increased lean mass and calorie intake [R, R, R, R, R, R].

Two meta-analyses confirmed the association of the 'A' variant with increased susceptibility to type 2 diabetes in Asians but not in Europeans [R, R].

The minor variants at the rs647126 and rs2075577 polymorphisms, which are usually inherited together, were associated with increased BMI in Dutch men. Based on their effect, the authors of the study speculated that these variants may reduce UCP3 activity [R].

LOWER ACTIVITY

Likely lower UCP3 activity based on 3 genetic variants we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
UCP3	rs1800849	GG
UCP2	rs647126	AA
UCP2	rs2075577	GG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

ADRB2 (Weight)

The **rs1042714** polymorphism (also known as Q27E) has been most widely researched. Its minor 'G' variant was associated with approximately 20% higher odds of obesity in a meta-analysis of 18 studies [R].

An older meta-analysis came to a similar conclusion. However, the authors observed a significant link between rs1042714-G and obesity only in populations with lower frequencies of this allele, such as Asians and Native Americans [R].

In two studies with 150 women, those with the 'G' allele had more fat mass and impaired burning [R, R].

This variant has also been linked to:

- Increased risk of cardiovascular events in coronary artery disease patients [R]
- Increased risk of Graves' disease in Caucasians [R]

On the bright side, this variant may decrease the risk of asthma in both adults and children [R].

Normally, leptin helps burn excess fat stores by stimulating the sympathetic activity in fat tissue. However, according to one clinical trial, this pathway may be suppressed in people with the above SNP. The 'G' allele carriers had higher leptin levels, but it failed to boost catecholamines, indicating leptin resistance [R].

Interestingly, this SNP doesn't seem to alter the function of beta-2 receptors. Scientists are still looking for the exact mechanism behind its effects on sympathetic activity and fat burning. It may be just a marker for another variant with functional consequences [R].

WORSE GENETICS

Likely worse ADRB2 genetics based on 1 genetic variant we looked at

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADRB2	rs1042714	CG

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

ADRB3 (Weight)

Over 100 studies have examined the relationship between one *ADRB3* variant—**rs4994** or Trp64Arg— and body-weight measures. The A>G switch at rs4994 changes one amino acid in the beta-3 receptor structure. The “mutant” receptor had a reduced ability to produce cAMP and burn fat in test tubes [R, R, R].

One meta-analysis included 97 studies, involving 44,800 participants. Among East Asians, those with the "G" allele had, on average, 0.31 units higher body mass index, which would equal 0.8-1 kg. In European descendants, the difference was four times smaller and wasn't statistically significant [R].

The same group of authors conducted the largest study of 4,854 European (UK) subjects and confirmed the lack of association between this SNP and BMI [R].

In a meta-analysis of 16 studies and 12,500 children and adolescents, rs4994-G correlated with 23% higher obesity rates. Once again, the effect stemmed from East Asian subjects, who had 47% higher odds of obesity per copy of the "G" allele [R].

A study of 329 adults from Saudi Arabia found a significant link between this SNP and obesity. People with the "G" allele also had a higher waist-hip ratio, blood lipids, leptin, and insulin levels [R].

Research has associated the same variant with other conditions, such as:

- Diabetes [R, R]
- High blood pressure [R]
- Heart disease [R]

Those genetic effects were also more pronounced in East Asians.

TYPICAL ACTIVITY

Likely typical ADRB3 activity based on 1 genetic variant we looked at

85%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **85% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
ADRB3	rs4994	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

CD36 (Fat Preference/Weight)

The CD36 receptor has a complicated relationship with diet and may affect everything from taste preferences to fat metabolism [R].

The ‘G’ allele at **rs1761667** is associated with a number of metabolic changes compared to the ‘AA’ genotype. For example, people with at least one copy have increased appetite and food intake. However, the ‘G’ allele is also associated with lower BMI [R, R, R].

The ‘A’ allele, meanwhile, is associated with reduced production of the CD36 receptor, increased preference for fatty foods, and increased BMI [R, R].

TYPICAL ACTIVITY

Likely typical CD36 activity based on 1 genetic variant we looked at

48%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **48% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CD36	rs1761667	GA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

CLOCK (Sleep & Weight)

The **rs1801260** polymorphism is the most studied SNP in the *CLOCK* gene. Its minor 'G' allele increases CLOCK activity and has been associated with many sleep-related traits, such as [R]:

- Abnormal and less stable circadian rhythms [R, R]
- Shorter sleep duration (≤6 h per day) [R, R, R]
- Being an evening person [R, R, R]
- Less activity overall, being active later in the day, and being sleepier during the morning [R, R]

This variant has also been linked to:

- Higher prevalence of obesity [R, R]
- Higher ghrelin (hunger hormone) levels and lower satiety [R, R]
- Higher insulin and insulin resistance [R]
- Low compliance with dietary programs, such as the Mediterranean diet [R]
- More difficulty losing weight from diets or bariatric surgery [R, R, R]

There is a link between how the *CLOCK* gene affects circadian rhythms and sleep on one hand, and metabolic balance and eating behavior on the other [R, R].

Studies have found that sleep deprivation disrupts metabolism by increasing the levels of the stress hormone cortisol and decreasing insulin sensitivity. Furthermore, a lack of sleep increases the levels of the hunger hormone ghrelin, which increases hunger and appetite -- thereby increasing the risk of obesity [R, R, R, R, R, R].

LOWER ACTIVITY

Likely lower CLOCK activity based on 1 genetic variant we looked at

48%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **48% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
CLOCK	rs1801260	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

TFAP2B (Weight/Diet)

Variations in the *TFAP2B* gene have been associated with increased weight and belly fat and type 2 diabetes. The majority of obesity and diet-related research focused on a SNP labeled **rs987237**. Its minor "G" allele may increase *TFAP2B* expression in fat cells [R, R, R].

In a huge meta-analysis of over 195,000 people, the "G" allele was associated with a higher body mass index (BMI) [R].

The "G" allele was associated with 24% obesity rates in a meta-analysis that included 34,600 European participants. Another large review of 16 trials found a link between this variant and waist circumference, which is a measure of abdominal obesity [R, R].

In a study of 642 obese adults, those with the "GG" genotype lost 2.6 kg more on a high-fat diet, compared with a low-fat diet. The "AG" carriers also preferred a high-fat diet, but the effect was less significant. On the other hand, people with the "AA" did better on a low-fat diet. The authors also discovered a similar but weaker pattern for waist size reduction [R].

One trial analyzed weight maintenance in 468 European people who completed a weight loss program. Those following a high-protein diet regained 1.84 kg more per each "G" allele. On the other hand, the "AA" carriers did better on a high vs. low-protein diet [R].

To sum up, the "G" allele is associated with obesity. As opposed to those with the "AA" genotype, "G" carriers may do better on a high-fat diet compared to a high-protein diet for losing weight and maintaining weight loss.

TYPICAL ACTIVITY

Likely typical TFAP2B activity based on 1 genetic variant we looked at

67%

OF USERS SHARE THE SAME SCORE

You have the same genetic predisposition as **67% of our users.**

Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
TFAP2B	rs987237	AA

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

PPARG (Metabolism)

Out of the different SNPs in the *PPARG* gene, researchers have mostly focused on rs1801282 (*Pro12Ala,* referred to as rs1805192 in some studies). Its 'G' allele changes one amino acid in the PPAR-γ structure, reducing its ability to activate target genes [R, R].

In a large meta-analysis of 75 studies and 49,000 subjects, the 'G' allele correlated with a slightly higher BMI. The link was more robust in European populations. A 2015 meta-analysis of 56 trials came to a similar conclusion. Another meta-analysis associated the 'G' allele with 55% higher obesity rates [R, R, R].

However, some studies failed to confirm a relationship between this variant and body weight, and some even observed a protective effect of the 'G' allele [R, R, R, R, R].

Among 978 elderly subjects, rs1801282-G correlated with 66% higher obesity rates. The lack of physical activity and increased intake of carbs amplified this genetic effect [R].

Interestingly, three studies found that people with rs1801282-G respond better to physical activity when it comes to metabolic improvements [R, R, R].

This variant may also affect weight loss from the Mediterranean diet. Several studies found that 'G' carriers lost more weight when eating a Mediterranean diet rich in MUFAs, PUFAs, and extra virgin olive oil but lost less or even gained it when eating a diet low in these and high in saturated fats [R, R, R, R, R].

PPAR-γ can be a double-edged sword when it comes to regulating blood sugar levels. While its activity in the liver and pancreas enhances glucose metabolism and insulin sensitivity, excess PPAR-γ activity in fat cells can accumulate fatty acids and other factors that contribute to insulin resistance and elevated blood sugar [R, R, R, R].

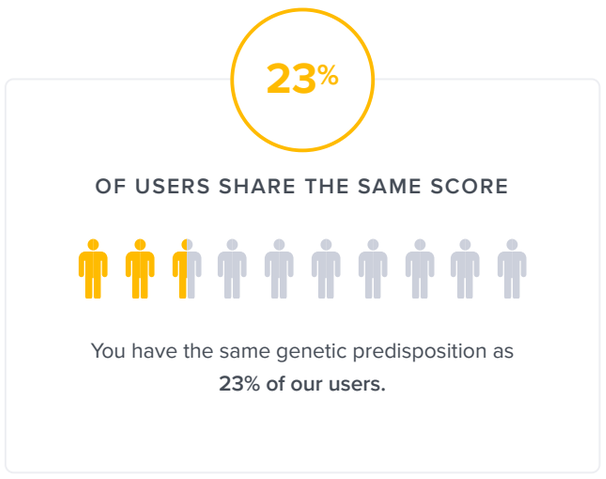
This may explain why the 'C' variant has been associated with higher blood sugar and increased rates of type 2 diabetes. In one of the studies, obesity further increased the risk of type 2 diabetes associated with this variant [R, R, R, R].

Two other variants, 'C' at rs1899951 and 'C' at rs17036160, have also been associated with high blood sugar and type 2 diabetes. However, they act as a single genetic factor because the three variants are usually inherited together [R, R].

Finally, the 'G' variant of rs1801282 has also been associated with

LOWER ACTIVITY

Likely lower PPARG activity based on 1 genetic variant we looked at



Your top variants that most likely impact your genetic predisposition:

GENE	SNP	GENOTYPE
PPARG	rs1801282	GC

The number of "risk" variants in this table doesn't necessarily reflect your overall result.

reduced rates and severity of acne [R, R].

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.

1. Aerobic Exercise (Cardio)
2. Keto Diet
3. Avoid Sugary Foods & Drinks
4. High-Intensity Interval Training (HIIT)
5. Fruits And Vegetables
6. Regular Sleep Schedule
7. Cinnamon
8. Yoga
9. Eat Fiber-Rich Foods
10. Eat More Protein and Less Carbs
11. Limit Calorie Intake
12. Paleo Diet
13. Whole-Food Plant-Based Diet
14. Apple Cider Vinegar
15. Chia Seeds

1 Aerobic Exercise (Cardio)

How to implement

Engage in at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity activity each week. Distribute this time over at least 3 days per week, avoiding consecutive days of vigorous exercise to allow for recovery.

TYPICAL STARTING DOSE

1 hour

How it helps

Tendency to Overeat

IMPACT 3 / 5

EVIDENCE 3 / 5

Physical exercise programs including cardio may reduce overeating in people with binge eating disorder [R].

Walking 200 minutes/week for 12 weeks reduced the likelihood of overeating and eating in response to internal cues in a non-placebo-controlled trial of 49 stress eaters [R].

Regular cardio increases metabolism and can reduce the urge to overeat by promoting satiety and improving mood.

Visceral Fat

IMPACT 3 / 5

EVIDENCE 3 / 5

Aerobic exercise, or cardio, helps to reduce visceral fat as it burns more calories, which results in a deficit leading to weight loss. Moreover, it specifically increases your heart rate, which stimulates the breakdown of visceral fat.

Three meta-analyses (the largest one with 35 studies) concluded that **aerobic exercise (30-60 min, at least 3x/week for 12-16 weeks) reduces visceral fat by over 30 cm2 in women and over 40 cm2 in men** [R, R, R].

Adiponectin

IMPACT 3 / 5

EVIDENCE 3 / 5

Cardio exercises like running or biking can help increase your body's production of adiponectin, a hormone that regulates glucose levels and fatty acid breakdown. This makes it beneficial for weight management, blood sugar control, and cardiovascular health.

A meta-analysis of 28 trials concluded that aerobic exercise **reduces serum leptin (by 2.24 ng/mL) and increases adiponectin (by 0.44 µg/mL)** [R].

Belly Fat

IMPACT 5 / 5

EVIDENCE 5 / 5

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise.** Both aerobic and strength exercise may be similarly effective at reducing belly fat area [R, R].

Exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

However, it might take a while to see the results of your hard work. **The benefits of moderate or intense exercise may only show after 12 weeks** [R, R, R, R, R].

Note that exercise may be less effective at helping you lose weight than limiting your calorie intake. However, **it will likely help you maintain a lower weight in the long run** [R, R, R].

Metabolic Rate

IMPACT 4 / 5

EVIDENCE 4 / 5

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

A single bout of aerobic exercise may increase metabolic rate in the short term, especially in men. Adding aerobic exercise to a low-calorie diet may prevent the decrease in metabolic rate due to the diet [R, R].

Exercise helps by increasing the amount of calories burnt during and a few hours after the workout [R, R].

Overweight

IMPACT 5 / 5

EVIDENCE 5 / 5

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

Multiple meta-analyses (the most recent one with 43 trials and 3,552 participants) found that both **aerobic and resistance training are equally effective for weight loss**. Exercise programs lasting 8-40 weeks **reduced weight (by 1.6-1.7 kg), waist circumference (by 1.95-2.12 cm), and belly fat area (by 5.39-13.05 cm2)** [R, R, R, R, R].

PERSONALIZED TO YOUR GENES

Cardio exercise may cause greater loss of weight and fat mass in people with your *ADIPOQ* gene variant [R].
Cardio exercise may cause greater loss of weight and fat mass in people with your *ADIPOQ* gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
RFC4	**rs266729**	CC	

GENE	SNP	GENOTYPE	EVIDENCE
ST6GAL1	**rs1501299**	TG	

Weight Regain

IMPACT 5 / 5

EVIDENCE 5 / 5

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight and prevent weight regain. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Aerobic exercise may help prevent weight regain in people who lost weight with diet or diet plus exercise. It may also help those who underwent bariatric surgery [R, R, R].

Aerobic exercise helps by burning calories and boosting your metabolism. It may also lower your appetite [R, R].

Metabolic Syndrome

IMPACT 5 / 5

EVIDENCE 4 / 5

Low levels of physical activity and prolonged sedentary behavior have been associated with an increased risk of metabolic syndrome. For instance, **high screen time may increase the risk by about 64%** [R, R, R, R].

In people with metabolic syndrome, exercise training may reduce BMI, body mass, waist circumference, systemic blood pressure, fasting glucose, triglycerides, and LDL cholesterol while increasing $VO2_{max}$ and HDL cholesterol [R].

When stratified by exercise type, **aerobic exercise may be most effective for improving anthropometric measurements and HDL cholesterol**, while strength training may be more effective for LDL cholesterol and systolic blood pressure. **Combined exercise may offer the greatest benefits** [R, R].

In obese children with metabolic syndrome, aerobic exercise may improve waist circumference, BMI, triglycerides, HDL cholesterol, and systolic blood pressure [R].

PERSONALIZED TO YOUR GENES

Cardio exercise may reduce the risk of metabolic syndrome more in people with your *LPL* gene variant [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
LPL	**rs3779788**	CT	●●●

2

Keto Diet

How to implement

Adopt a diet that consists of about 70-80% fat, 10-20% protein, and 5-10% carbohydrates. Eliminate or significantly reduce the intake of sugar and starches like bread, pasta, rice, and potatoes, focusing instead on high-fat foods like meats, fatty fish, eggs, butter, and healthy oils, as well as low-carb vegetables like leafy greens. This dietary pattern should be maintained consistently for a period of at least 3-4 weeks to achieve ketosis, after which it can be adjusted based on individual goals and responses.

How it helps

Tendency to Overeat

IMPACT 3 / 5 | EVIDENCE 3 / 5

The Keto diet promotes satiety due to high fat content and modest protein levels, reducing overall food intake. When in ketosis, your body utilizes fat for energy instead of glucose which may also lead to weight loss.

A meta-analysis of 24 studies concluded that ketogenic low-carbohydrate diets reduce hunger and desire to eat while increasing satiety/fullness [R].

Visceral Fat

IMPACT 3 / 5 | EVIDENCE 3 / 5

The Keto diet focuses on high-fat, low-carb foods that promote metabolic changes in your body. This leads to fat burning for energy, instead of carbs, helping reduce visceral fat accumulations.

A meta-analysis of 18 trials concluded that ketogenic diets decrease visceral adipose tissue by 28.91 g [R].

Overweight

IMPACT 4 / 5 | EVIDENCE 5 / 5

The Keto diet works by reducing your intake of carbs and increasing healthy fats, leading your body to a metabolic state called ketosis which uses fat as a primary fuel source. This, along with the fact that fats are more satisfying and reduce hunger, often leads to weight loss.

Multiple meta-analyses (the largest one with 18 studies) concluded that eating a very low-carbohydrate ketogenic diet lowers body weight (by 2.87-15.6 kg), BMI (by 1.44-5.3 kg/m2), waist circumference (by 3.23-12.6 cm), fat mass (by 1.40 kg), fat-free mass (by 0.81 kg), lean body mass (by 0.63 kg), and body fat percentage (by 2.81%). This diet may be more effective than other weight-loss interventions [R, R, R, R].

The combination of exercise and low-carbohydrate ketogenic diets decreases waist circumference according to a meta-analysis of 7 trials and 278 overweight and obese participants. Similarly, a meta-analysis of 13 trials and 244 participants found that combining strength training with a ketogenic diet decreases body mass (by 3.67 kg), fat mass (by 2.21 kg), fat-free mass (by 1.26 kg), BMI (by 1.37 kg/m2), and body fat percentage (by 2.27%) [R, R].

A meta-analysis of 14 studies concluded that eating a ketogenic diet lowers fasting glucose weight (by 8.66 kg), waist circumference (by 9.17 cm), and BMI (by 3.13 kg/m2) in patients with type 2 diabetes. Another meta-analysis (8 studies and 648 patients) found that very low-carbohydrate ketogenic diets decrease weight at 3 months (by 2.91 kg) and 6 months (by 2.84 kg) in people with this condition. In overweight patients with type 2 diabetes, ketogenic diets significantly decrease body weight and waist circumference according to a meta-analysis of 8 studies. A meta-analysis of 14 studies found that ketogenic diets lower weight in diabetic patients regardless of diabetic status [R, R, R, R].

Ketogenic diets also lower body fat percentage in athletes according to a meta-analysis of 8 studies [R].

In cancer patients, ketogenic diets reduce body weight (by 2.99-3.992 kg), fat mass (by 1.48 kg), and BMI (by 1.08 kg/m2) according to 3 meta-analyses (the largest one with 10 trials) [R, R, R].

3

Avoid Sugary Foods & Drinks

How to implement

To avoid sugary foods, eliminate or significantly reduce consumption of foods and beverages high in added sugars such as sodas, candies, baked goods, and sugary cereals from your diet. Instead, opt for natural sugar sources like fruits. Aim to do this daily for ongoing health benefits.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Sugary foods can spike blood sugar levels and lead to a cycle of cravings and overeating.

Visceral Fat

IMPACT 4 / 5 EVIDENCE 3 / 5

Consuming a lot of carbs and sugar-sweetened drinks is linked to high visceral fat levels. Likewise, eating pastry may increase visceral fat [R, R, R, R, R].

Diets low in carbs may help reduce visceral fat. Drinking less sugary beverages may also help [R, R, R, R, R].

Sugary foods are higher in calories. Extra calories that our bodies don't use get converted into fat [R].

PERSONALIZED TO YOUR GENES

People with your *MC4R* gene variant may have more visceral fat. They may process carbs less well [R]. Try limiting high-carb and sugary foods.

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
MC4R	**rs1350341**	AG	

Belly Fat

IMPACT 4 / 5 | EVIDENCE 3 / 5

Increased intake of dietary sugars is linked to an increase in body weight, which indirectly suggests a potential increase in waist circumference due to overall weight gain [R, R].

Consumption of SSBs is associated with an increase in waist circumference by **14%**, although the increase was not statistically significant in some studies. Soda drinks, a type of SSB, specifically showed a significant increase in waist circumference by **31%** [R].

Metabolic Syndrome

IMPACT 5 / 5 | EVIDENCE 3 / 5

A high glycemic dietary index has been associated with an increased risk of metabolic syndrome. In line with this, people who eat more carbs may be at increased risk of this condition [R, R].

Sugar-sweetened beverages may increase the risk of metabolic syndrome, type 2 diabetes, and excess weight [R, R, R, R].

Sugary foods can spike your blood sugar and insulin. **Over time, this can lead to insulin resistance and increase the risk of type 2 diabetes** [R, R, R].

People who eat more sugary foods also tend to have higher triglycerides [R, R].

4

High-Intensity Interval Training (HIIT)

How to implement

Engage in HIIT workouts for at least 30 minutes per session, 3 times a week. Each session should include short bursts of intense exercise, such as sprinting or fast cycling, for 30-60 seconds followed by a period of rest or lower-intensity exercise for 1-2 minutes. Adjust intensity and duration based on personal fitness level.

TYPICAL STARTING DOSE

30 minutes

How it helps

Tendency to Overeat

IMPACT 1 / 5 | EVIDENCE 1 / 5

A meta-analysis of 13 randomized controlled studies found that both high-intensity interval training (HIIT/SIT) and moderate-intensity continuous training (MICT) temporarily reduced appetite immediately after exercise. HIIT/SIT was slightly more effective in suppressing hunger 30-90 minutes post-exercise, but results varied in other appetite measures [R].

High-intensity interval exercise (HIIex) delayed lunch request compared to rest, but not moderate-intensity exercise (MICex). However, overall energy intake remained similar across conditions, resulting in a negative energy balance. HIIex likely affects eating behavior by delaying meal initiation [R].

However, in another study, 12 healthy males completed four trials in random order: moderate-intensity exercise (MIE) in normoxia, MIE in hypoxia, high-intensity interval exercise (HIIE) in normoxia, and HIIE in hypoxia. Hypoxia suppressed appetite and lowered ghrelin while HIIE raised PYY during exercise in hypoxic conditions. No differences in GLP-1 were observed [R].

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].

Visceral Fat

IMPACT 3 / 5 | EVIDENCE 3 / 5

High-intensity interval training is a time-efficient strategy to decrease fat mass deposits, including those of abdominal and visceral fat mass. HIIT may offer similar benefits to moderate-intensity continuous training [R, R].

Belly Fat

IMPACT 4 / 5

EVIDENCE 4 / 5

Numerous studies highlight the effectiveness of HIIT for reducing body fat, especially in women and overweight/obese individuals. HIIT outperformed MICT, with sprint interval training showing promise [R, R, R, R, R, R, R, R].

When it comes to abdominal obesity in particular:

- HIIT is more effective than MICT in reducing waist circumference [R].
- It may reduce WC in people with obesity and metabolic syndrome [R, R, R].
- It may not be effective in people with musculoskeletal disorders [R].

Metabolic Rate

IMPACT 4 / 5

EVIDENCE 4 / 5

Most experts agree that getting 150-300 minutes of exercise per week can help you control your weight. For best results, try to push yourself a bit with **moderate or intense exercise** [R, R].

Both continuous and HIIT exercise may be similarly effective at speeding up metabolism, but HIIT may be more effective when combined with whole-body electromyostimulation. Adding exercise to a low-calorie diet may prevent the decrease in metabolic rate [R, R, R].

Exercise helps by increasing the amount of calories burnt during and a few hours after the workout [R, R].

Overweight

IMPACT 5 / 5

EVIDENCE 4 / 5

HIIT exercises can help with being overweight by burning a significant amount of calories in a short amount of time and improving your metabolic rate. Additionally, it boosts the body's ability to burn fat, even hours post-workout, contributing to weight loss and preventing obesity.

Numerous studies highlight the effectiveness of HIIT for reducing body fat, especially in women and overweight/obese individuals. HIIT outperformed MICT, with sprint interval training showing promise. Combining HIIT with fasting or a Low-Carb High-Fat (LCHF) diet yielded favorable results, improving body composition and VO2max. HIIT was beneficial for obese adolescents and individuals with Type 2 diabetes, enhancing weight, BMI, blood pressure, and metabolic markers [R, R, R, R, R, R, R, R, R].

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].

Metabolic Syndrome

IMPACT 4 / 5

EVIDENCE 4 / 5

Low levels of physical activity and prolonged sedentary behavior have been associated with an increased risk of metabolic syndrome. For instance, **high screen time may increase the risk by about 64%** [R, R, R, R].

HIIT may help prevent metabolic syndrome by reducing fasting glucose, systolic and diastolic blood pressure, and waist circumference while increasing HDL cholesterol. In people with metabolic syndrome, HIIT may improve BMI, waist circumference, blood pressure, fasting glucose, HDL cholesterol, and triglycerides. However, continuous high-intensity training may be more effective for blood pressure [R, R].

Please note: *Intense exercise may not be suitable for people with chronic health conditions. Talk to your doctor before starting a new exercise regimen* [R].

5

Fruits And Vegetables

How to implement

Increase your intake of fruits and vegetables to at least five servings per day, aiming for a variety of types and colors to ensure a broad range of nutrients. Each serving size should roughly be the amount you can fit in one hand. Try to incorporate at least one serving of fruits or vegetables into every meal and snack throughout the day.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Fruits and vegetables are less calorie-dense and high in fiber, contributing to fullness without excess calorie intake.

Visceral Fat

IMPACT 3 / 5 EVIDENCE 3 / 5

A higher intake of fruits and vegetables is negatively associated with visceral or liver fat content in middle-aged men and women [R].

Dietary intake of fruits and green vegetables is associated with beneficial gene expression in both visceral and subcutaneous adipose tissues, suggesting a protective role against adiposity [R].

Overweight

IMPACT 3 / 5 EVIDENCE 3 / 5

A meta-analysis of 17 studies and 563,277 participants found an inverse association between fruit and vegetable consumption and weight, waist circumference, and adiposity. Similarly, interventions aimed at increasing fruit and vegetable intake reduce the prevalence of obesity in children and adolescents according to a meta-analysis of 22 studies and 12,678 participants [R, R].

In overweight or obese people, increased fruit and vegetable intake may have large effects on body weight (-2.81 kg) according to a meta-analysis of 16 studies and 3,719 participants [R].

In line with this, 2 meta-analyses (the most recent one with 12 trials and 1,151 studies) associated the adoption of a vegetarian diet with a weight reduction of 2.02-4.6 kg. The reduction was higher in people following a vegan diet, consuming a vegetarian diet with energy restriction, and following these diets for over 1 year [R, R].

Fruits and vegetables are rich in fiber and water, which may help promote satiety, but low in calories.

Weight Regain

IMPACT 0 / 5 EVIDENCE 0 / 5

Fruits and vegetables are low in calories and high in fiber, vitamins, and minerals, which are essential for a healthy weight.

Metabolic Syndrome

IMPACT 3 / 5 EVIDENCE 3 / 5

Plant-based diets have been associated with a decreased risk of metabolic syndrome and improved metabolic risk factors. This may be because these diets are lower in energy, saturated fat, and red and processed meats while being higher in fruits, vegetables, and fiber [R].

In line with this, a high dietary intake of fruits and vegetables has been associated with lower odds of metabolic syndrome. **Fruits may be especially protective.** In people with this condition, increasing fruit and vegetable consumption may lower diastolic blood pressure [R, R, R, R].

6 Regular Sleep Schedule

How to implement

Go to bed and wake up at the same time every day, even on weekends and holidays. This helps regulate your body's internal clock, leading to better sleep quality. Aim for 7-9 hours of sleep per night.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Maintaining a regular sleep schedule helps regulate hormones that control hunger and fullness, possibly decreasing the tendency to overeat.

Visceral Fat

IMPACT 3 / 5 EVIDENCE 3 / 5

Moreover, short sleep duration may be causally associated with increased visceral fat [R].

Studies have also shown that correcting sleep disorders such as obstructive sleep apnea (OSA) not only improves sleep quality but also leads to significant reductions in visceral fat [R].

Overweight

IMPACT 3 / 5 EVIDENCE 2 / 5

People with irregular sleep schedules may be at increased risk of being overweight or obese. This may be because irregular sleep patterns are associated with greater calorie and fat intake [R, R, R, R, R].

Consistent sleep patterns can aid in regulating hormones that control hunger and satiety.

Weight Regain

IMPACT 0 / 5 EVIDENCE 0 / 5

A consistent sleep schedule can regulate hormones that control hunger and appetite, which may help to prevent overeating and subsequent weight regain.

7 Cinnamon

How to implement

Take a 500 mg cinnamon supplement once daily, ideally with a meal to aid absorption. This can be in the form of a capsule or tablet. Continue this regimen as long as it aligns with your health goals and under the guidance of a

TYPICAL STARTING DOSE

healthcare provider.

500 mg

How it helps

Tendency to Overeat

IMPACT 1 / 5 | EVIDENCE 2 / 5

Cinnamon aids in controlling appetite by slowing down the process of food moving from the stomach to the intestine, making you feel fuller for longer. It also helps regulate blood sugar levels, which can reduce cravings and overeating.

In an open randomized crossover clinical trial with 21 healthy volunteers, a single intake of cinnamon infusion (2 g, Cinnamomum sp.) **did not affect energy metabolism** (energy expenditure, diet-induced thermogenesis, respiratory quotient, substrate oxidation) **but reduced feeling of satiety and increased energy intake** in the first meal after treatment [R].

On the contrary, another RCT with 27 people found that milk rice meal supplemented with either cinnamon (4 g), acetic acid (28 mmol), or the combination of cinnamon + acetic acid found that the combination reduced 2-hour postprandial blood glucose and **increased the satiety score at 15 and 30 minutes** [R].

Another RCT with 15 healthy subjects found that cinnamon (1 and 3 g) r**educed postprandial serum insulin and increased glucagon-like peptide 1 (GLP-1)** without affecting blood glucose, glucose-dependent insulinotropic polypeptide (GIP), ghrelin, **satiety**, or gastric emptying rate [R].

Visceral Fat

IMPACT 2 / 5 | EVIDENCE 2 / 5

Cinnamon helps control insulin levels and decreases blood sugar, which can assist with managing visceral fat. It also has a potential impact on fat metabolism, aiding in weight loss and belly fat reduction.

In a meta-analysis of 35 trials on metabolic diseases, ≤1.5 g/day of cinnamon lowered cholesterol, triglycerides, LDL, glucose, insulin, waist size, and improved HDL, systolic and diastolic blood pressure [R].
A systematic review and meta-analysis of 12 trials (786 subjects) found cinnamon supplementation aids weight loss, reducing body weight, BMI, waist circumference, and fat mass. There are more significant effects in younger subjects and those with a BMI ≥30 kg/m2. Effective at ≥2 g/day for ≥12 weeks [R].
However, a systematic review and meta-analysis of 18 clinical trials with patients with type 2 diabetes (T2DM) found that supplementation with cinnamon reduced FBS **but not** HbA1C, body weight, body mass index, and waist circumference, insulin or insulin resistance [R].
Similarly, in another systematic review and meta-analysis of 9 clinical trials with T2D people, cinnamon reduced systolic blood pressure and diastolic blood pressure **without affecting** body weight, body mass index, or **waist circumference** [R].

Overweight

IMPACT 2 / 5 | EVIDENCE 2 / 5

Cinnamon has been shown to modestly reduce BMI, body weight, and waist-hip ratio in various studies. Effects are more notable in individuals under 50 years and with higher initial BMI. Higher doses (≥2 g/day) and longer use (≥12 weeks) enhance these benefits. However, its impact on waist circumference and body fat mass is less clear. In those with PCOS or type 2 diabetes, cinnamon improves metabolic markers without significantly changing weight or BMI [R, R, R, R, R, R].

Weight Regain

IMPACT 2 / 5 | EVIDENCE 2 / 5

Cinnamon can help control blood sugar, which affects how hungry or energetic you feel and helps you drop weight. It also may slow down the breakdown of carbs in the digestive tract, which can suppress your appetite and prevent weight regain.

Obesity and Weight Management: Cinnamon has been shown to modestly reduce BMI, body weight, and waist-hip ratio in various studies. Effects are more notable in individuals under 50 years and with higher initial BMI. Higher doses (≥2 g/day) and longer use (≥12 weeks) enhance these benefits. However, its impact on waist circumference and body fat mass is less clear.

PCOS and Type 2 Diabetes: In PCOS, cinnamon improves metabolic markers without significant changes in weight or BMI. In type 2 diabetes, it reduces fasting blood sugar, but effects on HbA1C, body weight, BMI, and waist circumference are limited.

Cinnamon shows potential in lowering body weight and BMI, especially in specific groups like PCOS patients, but its effectiveness varies and does not significantly influence overall body composition in type 2 diabetes.

References: [R ,R, R, R, R, R]

Metabolic Syndrome

IMPACT 3 / 5 EVIDENCE 3 / 5

Supplementation with cinnamon **may lower total cholesterol, LDL cholesterol, and triglycerides while raising HDL cholesterol in people with metabolic syndrome** [R].

Cassia cinnamon (120-6,000 mg/day for 4-18 weeks) may improve blood sugar control in the general population [R, R, R, R].

It may help by [R, R, R]:

- Preventing oxidative stress
- Reducing insulin resistance

However, health experts say there's not enough evidence to recommend cinnamon supplementation for diabetes [R].

Cinnamon (up to 6 g/day for up to 5 weeks) may help lower triglycerides. It may be especially helpful in people with high blood sugar [R, R].

Cinnamon may help the body clear triglycerides. It may also reduce their production by supporting healthy blood sugar levels [R, R].

Please note: *Cassia cinnamon is high in coumarin. This substance may harm the liver in large amounts. Consult your doctor before supplementing with high doses of Cassia cinnamon* [R, R, R].

8 Yoga

How to implement

Practice yoga for at least 20 to 30 minutes a day, most days of the week. Choose a style that matches your fitness level and goals, and consider attending a class or using online resources to guide your practice.

TYPICAL STARTING DOSE
30 minutes

How it helps

Tendency to Overeat

IMPACT 2 / 5 EVIDENCE 1 / 5

Yoga, especially Hatha, may reduce emotional eating [R, R].

Yoga can increase body awareness and mindfulness, which may discourage overeating by favoring recognition of physical hunger and fullness cues.

Visceral Fat

IMPACT 1 / 5 EVIDENCE 1 / 5

In a non-placebo-controlled trial of 16 healthy postmenopausal women, practicing yoga for 16 weeks decreased visceral fat area [R].

Overweight

IMPACT 2 / 5 EVIDENCE 3 / 5

Yoga (1-7 days/week for at least 2 weeks) may help you lose weight by [R, R]:

- Increasing energy use
- Reducing stress
- Reducing impulsive eating

However, the studies are small and of moderate quality [R, R].

Metabolic Syndrome

IMPACT 4 / 5 EVIDENCE 3 / 5

Yoga may reduce risk factors for metabolic syndrome **as effectively as effective as exercise.** By reducing stress and increasing energy expenditure, yoga may help lower [R]:

- Blood sugar [R, R, R]
- Total and LDL cholesterol[R, R, R]
- Blood pressure [R]
- Weight [R, R]
- Triglycerides [R, R, R, R, R, R]

In people with this condition, **yoga may reduce waist circumference and systolic blood pressure** [R].

9 Eat Fiber-Rich Foods

How to implement

Incorporate foods high in fiber, such as fruits, vegetables, whole grains, and legumes, into your daily meals. Aim for a total dietary fiber intake of 25 to 30 grams per day, spread out over all meals.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Fiber increases satiety and delays gastric emptying, which can help control appetite and reduce overeating.

Visceral Fat

IMPACT 3 / 5 EVIDENCE 2 / 5

Fiber intake is linked to lower levels of visceral fat [R].

In line with this, eating whole-grain wheat bread (2.5 slices/day for 12 weeks) may help reduce visceral fat in people who are overweight or obese [R].

Other forms of fiber that may help reduce visceral fat include:

- Barley that contains β-glucan (4.4 g/day for 12 weeks) [R]
- Resistant maltodextrin (15 g/day for 12 weeks) [R]

Increased fiber intake may help lower calorie intake and maintain a healthy weight. It may also decrease fat production [R, R].

PERSONALIZED TO YOUR GENES

People with your *FTO* gene variant may have more visceral fat. Getting more fiber may reduce the impact of this variant on body fat [R, R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
FTO	**rs3751812**	TG	●●●○○

Belly Fat

IMPACT ●●●○○ 3 / 5 | EVIDENCE ●●●○○ 3 / 5

Fiber makes you feel more full and thus eat less. **In fact, getting 14 g more fiber per day is linked to a 10% lower calorie intake** [R].

Meta-analyses on dietary fiber and waist circumference have observed the following:

- A **10-g/day increase in total fiber intake** is linked to a decrease of **0.08 cm/year** in waist circumference [R].
- **A 10-g/day increase in cereal fiber intake** is linked to a reduction of **0.10 cm/year** in waist circumference [R].
- Isolated soluble fiber supplementation in overweight and obese individuals results in a significant reduction in waist circumference [R, R].
- Viscous fiber supplementation may not help reduce WC [R].

The following dietary and supplemental sources of fiber may support weight loss:

- Resistant starch: 10-40 g/day for 4-12 weeks [R, R, R]
- Psyllium: 6-16 g/day for 6-24 weeks [R]
- Flaxseed: at least 30 g/day for 12 weeks [R]
- Indigestible dextrin: 34 g/day for 12 weeks [R]

Overweight

IMPACT ●●●●○ 4 / 5 | EVIDENCE ●●●○○ 3 / 5

Fiber makes you feel more full and thus eat less. **In fact, getting 14 g more fiber per day is linked to a 10% lower calorie intake** [R].

Supplementing with fiber may support weight loss. Sources of fiber include:

- Resistant starch: 10-40 g/day for 4-12 weeks [R, R, R]
- Psyllium: 6-16 g/day for 6-24 weeks [R]
- Flaxseed: at least 30 g/day for 12 weeks [R]
- Indigestible dextrin: 34 g/day for 12 weeks [R]

Some fiber-rich diets that may help you control weight include:

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

PERSONALIZED TO YOUR GENES

People with your *TCF7L2* gene variant may lose more weight on a high-fiber diet [R].
People with your *FTO* gene variant are less likely to be obese if they get more fiber [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
TCF7L2	**rs7903146**	CC	●●●○○
FTO	**rs3751812**	TG	●●●○○

Weight Regain

IMPACT 0 / 5 | EVIDENCE 0 / 5

Fiber assists in weight management by increasing satiety and reducing overall calorie absorption.

Metabolic Syndrome

IMPACT 3 / 5 | EVIDENCE 3 / 5

People with a high dietary intake of fiber may be at decreased risk of metabolic syndrome [R, R].

Getting enough fiber in your diet has many beneficial effects. Lowering blood pressure is one of them [R, R].

Dietary fiber may help reduce blood sugar levels. **People who eat more fiber may be at a lower risk of diabetes.** This is because **fiber delays the absorption of sugar**, which prevents blood sugar spikes. It may even boost your response to insulin [R, R, R].

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].

Adding fiber-rich foods to the diet may reduce triglycerides. However, not all studies showed this effect [R, R, R, R].

Fiber makes you feel more full and thus eat less. **In fact, getting 14 g more fiber per day is linked to a 10% lower calorie intake** [R].

10

Eat More Protein and Less Carbs

How to implement

Include a source of lean protein such as chicken, fish, beans, or tofu in each meal, aiming for 20-30 grams per serving, while reducing carbohydrate-rich foods like bread, pasta, and sweets, aiming to make proteins about 30-40% of your daily caloric intake. Replace at least one carbohydrate-heavy meal or snack with a high-protein option daily.

How it helps

Tendency to Overeat

IMPACT 0 / 5 | EVIDENCE 0 / 5

Protein has a higher satiety index than carbs, helping reduce the urge to overeat by keeping you full longer.

Visceral Fat

IMPACT 2 / 5 | EVIDENCE 2 / 5

A study found that a low carbohydrate, high protein diet (for 4 weeks) led to a reduction in visceral fat compared to a high carbohydrate diet. This effect was particularly noticeable in obese people with type 2 diabetes [R].

A study comparing low carbohydrate to high carbohydrate diets (for 3 months) in diabetic people found that the low carbohydrate group had improved insulin sensitivity and a larger decrease in visceral fat. This suggests that reducing carbohydrate intake can have specific benefits for those with metabolic issues [R].

Belly Fat

IMPACT 3 / 5 | EVIDENCE 3 / 5

Most weight loss experts recommend following a diet that's higher in protein and lower in carbs or fat [R, R].

This is because protein [R, R]:

- Boosts your metabolism
- Makes you feel more full
- Helps control your appetite

On the other hand, simple carbs spike your insulin, which is linked to a higher risk of obesity [R].

However, high-protein low-carb diets have shown less convincing results when it comes to belly fat in particular. They may modestly reduce waist circumference and may not be more effective than other diets [R, R, R].

Metabolic Rate

IMPACT 3 / 5 | EVIDENCE 4 / 5

Most weight loss experts recommend following a diet that's high in protein but lower in carbs or fat [R, R].

Research suggests that getting more calories from protein (as opposed to either carbohydrates or fat) may support weight loss, metabolism, and satiety. High-protein diets appeared to increase fat burning and weight loss and reduce appetite in a handful of human studies [R, R, R, R].

Some low-carb diets that may help you lose weight include:

- **Keto diet**: low-carb and high-fat diet [R, R, R]
- **Atkins diet**: low-carb diet [R, R, R, R, R]
- **Paleo diet**: hunter-gatherer diet (limited carbs, dairy products, and legumes) [R, R, R]
- **Zone diet**: meals consist of 40% complex carbs, 30% protein, and 30% fat [R]

Note: *In the long run, high-protein diets may contribute to heart disease, calcium loss, constipation, and other health problems. If you have problems with kidneys or bones, consult your doctor or dietitian before adopting a high-protein diet* [R, R].

Overweight

IMPACT 5 / 5 | EVIDENCE 4 / 5

Most weight loss experts recommend following a diet that's high in protein but lower in carbs or fat [R, R].

This is because protein [R, R]:

- Boosts your metabolism
- Makes you feel more full
- Helps control your appetite

In contrast, carbs and fats make you crave junk food by activating the reward areas of your brain [R, R].

Simple carbs can also spike your insulin, which is linked to a higher risk of obesity [R].

Some low-carb diets that may help you lose weight include:

- **Keto diet**: low-carb and high-fat diet [R, R, R]
- **Atkins diet**: low-carb diet [R, R, R, R, R]
- **Paleo diet**: hunter-gatherer diet (limited carbs, dairy products, and legumes) [R, R, R]
- **Zone diet**: meals consist of 40% complex carbs, 30% protein, and 30% fat [R]

Sticking to a low-fat diet for 2-12 months may also support weight loss [R, R, R, R, R]. However, a **low-carb diet may be more effective** [R, R, R, R, R].

Note: *In the long run, high-protein diets may contribute to heart disease, calcium loss, constipation, and other health problems. If you have problems with kidneys or bones, consult your doctor or dietitian before adopting a high-protein diet* [R, R].

PERSONALIZED TO YOUR GENES

People with your *FTO* gene variant may lose more weight on a high-protein diet [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
FTO	**rs1558902**	AT	●●●○○

Weight Regain

IMPACT 0 / 5 EVIDENCE 0 / 5

Eating more protein can increase metabolism and reduce appetite, while keeping carbs moderate helps prevent spikes in blood sugar that can lead to weight gain.

Metabolic Syndrome

IMPACT 3 / 5 EVIDENCE 3 / 5

Low-carb, high-protein diets may improve metabolic syndrome factors such as excess weight and waist circumference, insulin resistance, high cholesterol, or high triglycerides [R, R].

Most weight loss experts recommend following a diet that's high in protein but lower in carbs or fat. However, a **low-carb diet may be more effective** [R, R].

Note: *In the long run, high-protein diets may contribute to heart disease, calcium loss, constipation, and other health problems. If you have problems with kidneys or bones, consult your doctor or dietitian before adopting a high-protein diet* [R, R].

11

Limit Calorie Intake

How to implement

Consume fewer calories than your body needs for maintenance. Calculate your daily caloric needs using an online calculator based on your sex, age, weight, height, and activity level, then reduce that number by 500-1000 calories per day to safely lose 1-2 pounds per week. Adjust the caloric intake as needed based on your progress.

How it helps

Tendency to Overeat

IMPACT 0 / 5

EVIDENCE 0 / 5

Limiting calorie intake is crucial in managing the tendency to overeat and maintaining a healthy weight.

Visceral Fat

IMPACT 2 / 5

EVIDENCE 1 / 5

A study on intermittent versus daily calorie restriction demonstrated that both methods effectively reduced visceral fat as estimated by waist circumference reduction. While daily calorie restriction reduced waist circumference by about 6.5%, intermittent calorie restriction achieved similar reductions in the short term and slightly better results in moderate-term trials [R].

Belly Fat

IMPACT 4 / 5

EVIDENCE 5 / 5

To promote weight loss, experts recommend lowering your calorie intake by 30% of your daily requirement [R, R].

Eating fewer calories and intermittent fasting may support short-term weight loss equally. On the other hand, people who eat fewer calories may maintain their weight loss better in the long run [R, R, R, R, R, R].

Combining time-restricted eating with caloric restriction results in significantly greater reductions in waist circumference: **2.36 cm** vs 1.27 cm [R].

A good way to limit calorie intake is to eat more low-calorie foods. These include soups and foods rich in protein and fiber. You can also try eating a low-calorie snack before a meal [R, R, R].

Overweight

IMPACT 5 / 5

EVIDENCE 5 / 5

To promote weight loss, experts recommend lowering your calorie intake by 30% of your daily requirement [R, R].

Eating fewer calories and intermittent fasting may support short-term weight loss equally. On the other hand, people who eat fewer calories may maintain their weight loss better in the long run [R, R, R, R, R, R].

Types of intermittent fasting that may be especially helpful for weight loss include:

- **Alternate-day fasting**: fasting every other day [R]
- **Time-restricted eating**: eating within a certain time frame each day [R, R, R, R, R]

A good way to limit calorie intake is to eat more low-calorie foods. These include soups and foods rich in protein and fiber. You can also try eating a low-calorie snack before a meal [R, R, R].

These methods can help make you feel more full and thus eat less [R, R, R].

Please note: *Limiting calorie intake too much or fasting for too long can cause malnutrition, anemia, eating disorders, and other health problems. Children, pregnant women, and people with certain chronic conditions or substance abuse disorders shouldn't do intermittent fasting. Talk to your doctor before implementing any drastic calorie restriction* [R].

PERSONALIZED TO YOUR GENES

People with your *UCP3* gene variant may lose more weight on a low-calorie diet [R].
People with your *VEGFA* gene variant may lose more weight by eating fewer calories [R].

YOUR GENETIC VARIANTS

GENE	SNP	GENOTYPE	EVIDENCE
UCP3	**rs1800849**	GG	●●●○○

GENE	SNP	GENOTYPE	EVIDENCE
VEGFA	**rs1358980**	CC	●●●○○

Weight Regain

IMPACT 0 / 5 | EVIDENCE 0 / 5

Keeping calorie intake in check is crucial for avoiding weight regain and maintaining a healthy weight.

Metabolic Syndrome

IMPACT 5 / 5 | EVIDENCE 3 / 5

People who eat a high-calorie diet may be at increased risk of metabolic syndrome [R].

In line with this, different fasting modalities **may improve metabolic syndrome parameters such as body weight, BMI, body fat percentage, fasting insulin, and insulin resistance** in people with metabolic syndrome. Fasting during Ramadan may also help people with metabolic syndrome [R, R, R].

12

Paleo Diet

How to implement

Adopt a diet that includes lean meats, fish, fruits, vegetables, nuts, and seeds, resembling the diet of our hunter-gatherer ancestors. Exclude all dairy products, legumes, grains, added sugar, and processed foods. This should be a consistent dietary approach, not a short-term diet, to observe its benefits on health and well-being.

How it helps

Tendency to Overeat

IMPACT 1 / 5 | EVIDENCE 1 / 5

In a non-placebo-controlled trial of 13 patients with type 2 diabetes, eating a Paleo diet for 2 consecutive 3-month periods was found more satiating per calorie than eating a diabetes diet. This diet also increased satiety and the levels of satiety hormones in a non-placebo-controlled trial of 69 participants with metabolic syndrome [R, R].

The Paleo diet can help curb overeating by keeping you satiated with its high protein and fiber content.

Visceral Fat

IMPACT 1 / 5 | EVIDENCE 1 / 5

In a non-placebo-controlled trial of 69 participants with metabolic syndrome, eating a Paleo diet for 10 weeks reduced visceral fat [R].

The Paleo diet encourages a reduced intake of processed foods and sugars, which can contribute to lowering visceral fat.

Overweight

IMPACT 3 / 5 EVIDENCE 3 / 5

Numerous studies and meta-analyses confirm that adopting a Paleo diet leads to substantial improvements in body weight, BMI, and waist circumference. On average, individuals following a Paleo diet experience a weight loss of around 3.52 kg, reduced BMI, and decreased waist circumference. These effects are even more pronounced in the short term [R, R, R, R, R, R, R].

The Paleo diet may help by focusing on whole, unprocessed foods that promote satiety, thus reducing calorie intake. It also stabilizes blood sugar, helping to avoid energy spikes and crashes that can stimulate overeating.

Metabolic Syndrome

IMPACT 3 / 5 EVIDENCE 3 / 5

Adopting a Paleo diet may reduce waist circumference, triglycerides, systolic and diastolic blood pressure, and fasting glucose while raising HDL cholesterol in people with metabolic syndrome [R].

The Paleo diet (for 4-24 weeks) may lower total cholesterol, LDL cholesterol, and triglycerides, while increasing HDL cholesterol [R, R].

A meta-analysis of 67 trials comparing 13 different dietary approaches concluded that the Paleolithic diet is the second most effective one (after DASH) for lowering blood pressure [R].

13 Whole-Food Plant-Based Diet

How to implement

To implement a plant-based diet, fill your meals with fruits, vegetables, legumes, seeds, and whole grains. Aim for at least 5 servings of fruits and vegetables per day, include legumes in your meals several times a week, and choose whole grains over refined grains. Adjust your diet gradually over a few weeks to avoid digestive discomfort.

How it helps

Tendency to Overeat

IMPACT 1 / 5 EVIDENCE 1 / 5

A vegan diet, inherently rich in high-fiber fruits, vegetables, and whole grains, can enhance satiety, helping control your hunger and reduce overeating. Additionally, the typically lower caloric density of such foods allows for larger portions, promoting feelings of fullness without excess calorie intake.

In a non-placebo-controlled trial of 60 men, eating a vegan snack increased satiety (by 9-25%) and postprandial levels of GLP-1, amylin, and PYY [R].

Visceral Fat

IMPACT 1 / 5 EVIDENCE 1 / 5

A vegan diet, which is rich in fiber from plant-based foods, can help reduce visceral fat by improving gut health and boosting metabolism. Additionally, such diets are often lower in calories, which can assist in weight loss and consequently reduce the amount of visceral fat.

In a non-placebo-controlled trial of 168 healthy volunteers, eating a vegan diet for 16 weeks caused a smaller decrease of *Bacteroides fragilis*, which was associated with a greater loss of body weight, fat mass, visceral fat, and a greater increase in insulin sensitivity [R].

An uncooked vegan diet also altered the gut microbiome in a non-placebo-controlled trial of 18 healthy volunteers [R].

In a non-placebo-controlled trial of 43 rheumatoid arthritis patients, eating an uncooked vegan diet rich in lactobacilli for 1-month improved disease activity and changed the fecal microbiota [R].

Belly Fat

IMPACT 3 / 5 EVIDENCE 4 / 5

Following a plant-based diet (for 1-24 months) may support weight loss. The fiber in a plant-based diet may help reduce weight and waist circumference by [R, R, R]:

- Improving the body's response to insulin
- Reducing appetite

It may offer greater benefits when combined with calorie restriction [R, R].

In one meta-analysis, plant-based diets significantly reduced waist circumference by **4.3%** in individuals with type 2 diabetes compared to regular meat-eating diets [R].

Other meta-analyses showed a WC reduction of about 2.2 cm on plant-based diets [R].

Overweight

IMPACT 3 / 5 EVIDENCE 3 / 5

Following a vegetarian diet (for 1-24 months) may support weight loss. The fiber in a vegetarian diet may help by [R, R]:

- Improving the body's response to insulin
- Reducing appetite

Plant-based diets may offer greater benefits when combined with calorie restriction [R, R].

This type of diet may also support weight loss in people with type 2 diabetes [R].

Weight Regain

IMPACT 0 / 5 EVIDENCE 0 / 5

A plant-based diet often leads to a lower calorie intake and can include many foods that promote satiety.

Metabolic Syndrome

IMPACT 3 / 5 EVIDENCE 3 / 5

Plant-based diets have been associated with a decreased risk of metabolic syndrome and improved metabolic risk factors. This may be because these diets are lower in energy, saturated fat, and red and processed meats while being higher in fruits, vegetables, and fiber [R].

However, a meta-analysis found no protective effects of the vegetarian diet on the development of metabolic syndrome. This diet was, however, associated with lower systolic blood pressure, diastolic blood pressure, and fasting glucose, and higher HDL cholesterol [R].

In line with this, a high dietary intake of fruits and vegetables has been associated with lower odds of metabolic syndrome. **Fruits may be especially protective.** In people with this condition, increasing fruit and vegetable consumption may lower diastolic blood pressure [R, R, R, R].

In contrast, a high intake of red and processed meat has been associated with an increased risk of metabolic syndrome [R, R].

14 Apple Cider Vinegar

How to implement

Incorporate 1-2 tablespoons of apple cider vinegar into your diet daily by diluting it in a large glass of water. Consume this mixture before meals to potentially benefit from its effects.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Apple cider vinegar may help control overeating by increasing feelings of fullness after meals, reducing your calorie intake. It contains acetic acid that slows down stomach emptying, making you feel satiated for longer.

Visceral Fat

IMPACT 1 / 5 EVIDENCE 1 / 5

Apple Cider Vinegar may help in reducing visceral fat by promoting satiety, reducing blood sugar, and lowering insulin levels. Hence, its regular consumption can aid in weight loss and fat reduction.

In a placebo-controlled trial of 155 obese participants, consuming 500 mL/day of a beverage with 15-30 mL vinegar for 12 weeks reduced visceral fat [R].

Overweight

IMPACT 2 / 5 EVIDENCE 2 / 5

Apple vinegar (15-30 mL/day, in salads or diluted in water, for 12 weeks) may reduce body weight and fat by [R, R, R]:

- Decreasing appetite
- Reducing fat production

15 Chia Seeds

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.

How it helps

Tendency to Overeat

IMPACT 0 / 5 EVIDENCE 0 / 5

Chia seeds are high in fiber, promoting a sense of fullness, which could potentially curb overeating. Also, they expand when exposed to water in your stomach, further reducing hunger and assisting in weight management.

Visceral Fat

IMPACT 1 / 5

EVIDENCE 1 / 5

Chia seeds are high in fiber and protein, which can help reduce visceral fat by making you feel full and reducing calorie intake. Additionally, they are a good source of omega-3 fatty acids that can further assist in reducing this fat by increasing metabolism and promoting fat burn.

Overweight

IMPACT 1 / 5

EVIDENCE 1 / 5

Chia seeds may promote weight in overweight subjects and type 2 diabetes patients. However, the evidence is mixed and some studies only found benefits in some metabolic parameters other than weight [R, R, R, R, R].

Chia seeds are high in fiber, which aids in controlling hunger and promoting a feeling of fullness, which can help reduce calorie intake. They also balance your blood sugar levels, helping in preventing overeating.

Metabolic Syndrome

IMPACT 1 / 5

EVIDENCE 1 / 5

Supplementation with chia seeds may lower postprandial glucose and diastolic blood pressure in all sorts of populations, including people with metabolic syndrome [R].

Chia seeds may also improve fasting glucose [R, R, R].