

24Genetics



Mike, this is your
nutrition report





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1. Introduction

In the following pages you will find your nutrigenetics report created from the analysis of your DNA. You will get detailed information about the relationship between your genes and your nutritional response.

Thanks to the sequencing of your DNA and its subsequent analysis, you will know the response predisposition of your body to nutrients such as fats, carbohydrates, vitamins and minerals, which is a great help when adapting your diet.

Nutrigenetics is just one part of the elements that influence your response to nutrition. Other factors such as allergies, intolerances, bioma and lifestyle habits also influence your response to food and these are not reflected in this report.

For a better visualization, in the first pages you can find an icons summary that graphically indicate the balance of your results, followed by your customized analysis.

We remind you that any changes you want to make in your diet should be guided by health professionals such as Nutritionists, Geneticists or Doctors.

Any doubts that you may have about your genetic test should be checked with a Genetic Diagnosis professional or Specialized Nutritionists.

The information provided in this report is valid only for research, information and educational uses. In no case is it valid for clinical or diagnostic use.

Thanks for trusting 24Genetics.

1.1. Frequently Asqued Questions

Is this test the same as food intolerance tests?

No, a genetic test has nothing to do with a test of food intolerance, nor with food allergies tests. They are different tests with totally different information. Genetic testing is infinitely more complex and expensive than the tests described above and the genetic information we get can not be found in any other way.

Should I make drastic changes because of this test results?

No, any changes you want to make in your health and nutrition management should be guided by health professionals such as nutritionists, geneticists or doctors. Any question you have about any genetic test should be checked with an experts in Genetic Diagnosis or Specialized Nutritionists.

Does it all depend on my genes?

No, our body responds to a lot of conditions. Our genes are certainly an important parameter. Lifestyle, sport, food, and many other circumstances influence our body. Knowing yourself well clearly help us to treat our body in the most appropriate way. And this is what this tests are about:



more knowledge.

Are all the analyzed genes listed in the sections?

We include only a sample of the genes we analyze, some of the sections are defined by the analysis of some more genes that we do not show in the report. Our algorithms combine all your genotypes from the analyzed markers.

What is this report based on?

This test is based on different genetic studies internationally consolidated and accepted by the scientific community. There are some scientific databases where studies, with a certain level of consensus, are published. Our genetic tests is done by applying these studies to your genotype. In each section you will see some of the studies on which it is based. There are sections where more studies are used than those listed.

The information provided in this report is valid only for research, information and educational uses. It is not valid for clinical or diagnostic use..



2. Summary

A healthier nutrition



Caption:

- Your analyzed genotype is favorable.
- Your analyzed genotype is a little favorable.
- Your analyzed genotype doesn't particularly affect you.
- Your analyzed genotype is a little unfavorable.
- Your analyzed genotype is unfavorable.

Vitamins and minerals



Caption:

- Your analyzed genotype is favorable.
- Your analyzed genotype is a little favorable.
- Your analyzed genotype doesn't particularly affect you.
- Your analyzed genotype is a little unfavorable.
- Your analyzed genotype is unfavorable.

Metabolic



Caption:

- Your analyzed genotype is favorable.
- Your analyzed genotype is a little favorable.
- Your analyzed genotype doesn't particularly affect you.
- Your analyzed genotype is a little unfavorable.
- Your analyzed genotype is unfavorable.

Your senses

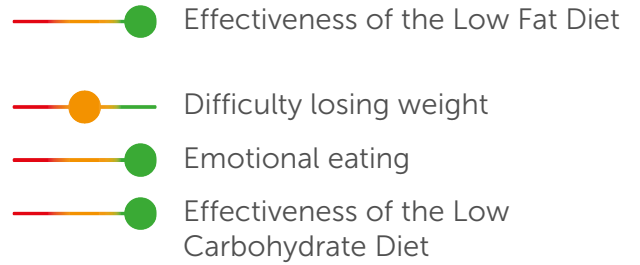
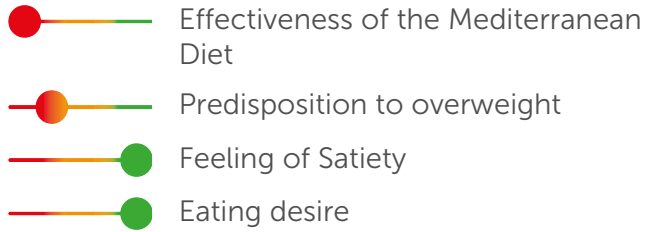




Caption:

- Your analyzed genotype is favorable.
- Your analyzed genotype is a little favorable.
- Your analyzed genotype doesn't particularly affect you.
- Your analyzed genotype is a little unfavorable.
- Your analyzed genotype is unfavorable.

Your weight and you



Caption:

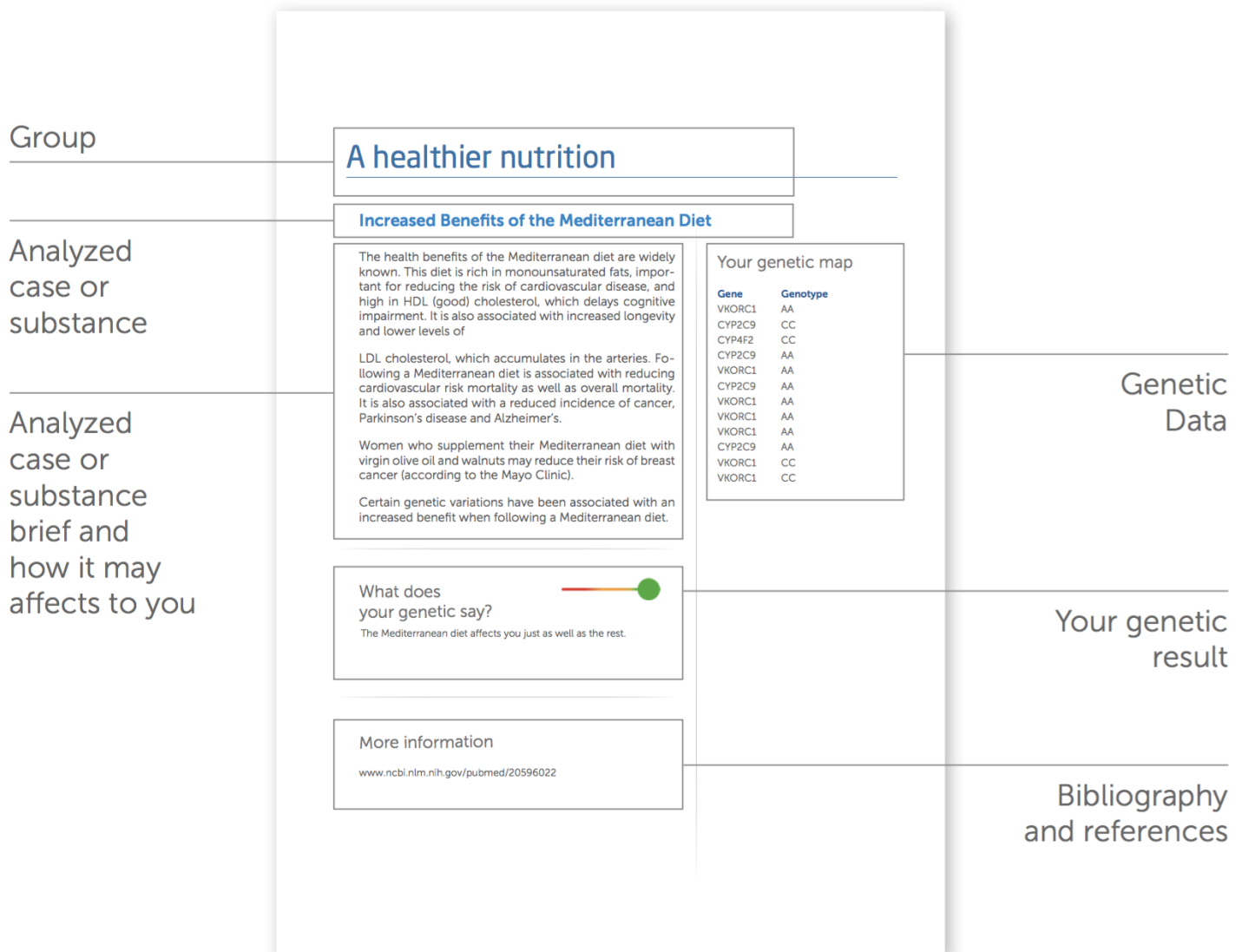
- Your analyzed genotype is favorable.
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- Your analyzed genotype is a little unfavorable.
- Your analyzed genotype is unfavorable.





3. Genetic Results

3.1. What information is included in the results?



3.2. Your genetic results



A healthier nutrition

Increased Benefits of the Mediterranean Diet

The health benefits of the Mediterranean diet are widely known. This diet is rich in monounsaturated fats, important for reducing the risk of cardiovascular disease, and high in HDL (good) cholesterol, which delays cognitive impairment. It is also associated with increased longevity and lower levels of LDL cholesterol, which accumulates in the arteries. Following a Mediterranean diet is associated with reducing cardiovascular risk mortality as well as overall mortality. It is also associated with a reduced incidence of cancer, Parkinson's disease and Alzheimer's.

Women who supplement their Mediterranean diet with virgin olive oil and walnuts may reduce their risk of breast cancer (according to the Mayo Clinic).

Certain genetic variations have been associated with an increased benefit when following a Mediterranean diet.

Your genetic map

Gene	Genotype
PPARG	CC

What does your genetic say?



The Mediterranean diet affects you just as well as the rest.

More information:

<http://circgenetics.ahajournals.org/content/8/1/91.long>



A healthier nutrition

Omega 6 and Omega 3 Levels

Polyunsaturated fats (healthy fats) are mainly omega-3 and omega-6 fatty acids. Omega-3s are a key family of polyunsaturated fats (EPA / DHA / ALA) beneficial to brain and cardiovascular health: they lower blood pressure and heart rate, improve blood vessel function, reduce triglycerides and inflammation, and are good for eyesight and skin. Along with omega-3 fats, omega-6 fatty acids play a crucial role in brain function and normal growth and development. Omega-6s help stimulate hair and skin growth, maintain bone health, regulate metabolism, and maintain the reproductive system.

A healthy diet should provide the same ratio of omega-6 to omega-3, but in the current diet the amount of omega-6 fatty acids predominates.

In large-scale studies it has been observed that certain variants of the FADS gene cause carriers to have decreased omega-6 and omega-3 levels.

Your genetic map

Gene	Genotype
FADS1	CC

What does your genetic say?



You present a genotype associated with lower processing of essential fatty acids, omega-6 (ARA) and omega-3 (EPA), and therefore, will present decreased levels in blood. It is recommended to control omega-6 intake and increase omega-3-rich foods.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4123862/>



A healthier nutrition

Excessive fat consumption

Fat is a great source of energy and essential fatty acids and also facilitates the absorption of fat-soluble vitamins.

However, excessive consumption can lead to cardiovascular disease, overweight and obesity.

Several recent studies in the US and Europe indicate that the percentage of calories derived from saturated fat is above the acceptable limit, whereas the opposite is true with monounsaturated and polyunsaturated fats.

Certain genetic variations predispose carriers to ingest more fats by increasing their appetite for foods rich in them.

Your genetic map

Gene	Genotype
SLC46A3	CC

What does your genetic say? 

You do not have a greater appetite for foods rich in fats. This genotype does not affect you negatively.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3522587/>



A healthier nutrition

Low vegetables consumption

Fruits and vegetables are the main source of vitamins and minerals in the diet. Its consumption reduces cardiovascular diseases, some cancers and helps us to maintain a healthy weight.

According to the Harvard Public Health School, the recommended daily allowance of fruits and vegetables is 50% of the total intake in a healthy diet. Many people consume less than this amount.

Three genetic variations in the TAS2R38 gene have been studied that predispose to a lower consumption of vegetables.

Your genetic map

Gene	Genotype
TAS2R38	CG
TAS2R38	AG
TAS2R38	TC

What does your genetic say?



Women with this haplotype are predisposed to consume less vegetables because of a greater sensitivity to bitter taste. There are no data that affirm the same in men. Both women and men with this haplotype consume more sweet foods.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4235829/>



A healthier nutrition

Excessive intake of carbohydrates

Carbohydrates are the main source of energy for the brain and to maintain body weight. In several large-scale studies it has been observed that people with certain genetic variations have a greater appetite for carbohydrates, which can lead to excessive consumption.

The recommended carbohydrate intake is 45-65% of total daily calories. Starches and sugars are the main types of carbohydrates. Cereals and vegetables are sources of starches. Natural sugars are found in fruits and natural juices, while added sugars are present in soft drinks, bottled juices, desserts and sweets. Excessive craving for carbohydrates is unhealthy, so we recommend that your diet contain a balanced combination of carbohydrates, proteins and fats, an adequate amount of fiber and limited added sugars.

Your genetic map

Gene	Genotype
LOC10537049	GG
FGF21	AG
FGF21	AG

What does your genetic say?



You have a genotype associated with a greater appetite for carbohydrates. It is recommended to monitor and follow a balanced diet in terms of the proportion of macronutrients and control the recommended intake of carbohydrates.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3652928/>



Vitamins and minerals

Vitamin B2

Vitamin B2 (riboflavin) is a central component of two molecules that serve as cofactor of various enzymes involved in energy production, carbohydrate, fat and protein metabolism, iron absorption and normal cellular functioning.

Recent research shows that riboflavin plays an important role in cancer prevention and relieves migraine. Deficiency of this vitamin may cause weakness, sore throat, swelling of the tongue, cracking of the skin, hair loss, dermatitis and anemia. It can also affect vision (including blurred vision), burning, itching, eye pain or light-sensitive sight and fatigue. Excess riboflavin is excreted in the urine, so there is no risk of overdose.

Certain genetic variants in the MTHFR gene predispose to high levels of homocysteine, a substance related to cardiovascular disease if it is at high levels, which can be corrected by vitamin B2.

Your genetic map

Gene	Genotype
MTHFR	GG

What does your genetic say?



You are predisposed to have normal levels of vitamin B2 and homocysteine.

More information:

<http://circ.ahajournals.org/content/113/1/74.long>



Vitamins and minerals

Vitamin B6

Vitamin B6 (pyridoxine) is involved in numerous essential processes, such as protein metabolism, proper functioning of the neurological system, production of hemoglobin, and maintenance of normal levels of homocysteine. Even slight imbalances in vitamin B6 levels can lead to various symptoms: nerve inflammation, irritability, depression, dermatitis, cracked and sore lips, swollen mouth and tongue, and confusion. Vitamin B6 is found naturally in many foods like peas, whole grains, meat, eggs and fish. Most people get enough vitamin B6 when following a balanced diet and deficiency of this vitamin is uncommon.

The genetic marker rs4654748 of the NBPF3 gene has been associated in numerous studies with reduced levels of vitamin B6, possibly due to a greater degradation of the vitamin in the blood. Studies show an association between vitamin levels and different genotypes, however, this does not mean that your levels are not adequate.

Your genetic map

Gene	Genotype
NBPF3	TC

What does your genetic say?



You have the variant of the NBPF3 gene associated with lower levels of B6, so you are more likely to have decreased blood levels. We recommend that you increase the consumption of foods rich in this vitamin.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2667971/>



Vitamins and minerals

Vitamin B12

Vitamin B12 (cobalamin) plays an important role in the functioning of the brain, nervous system, digestive system, is an essential component for the synthesis and regulation of DNA and for the metabolism of fatty acids and amino acids. It is produced by bacteria and is found naturally in foods of animal origin: meat, fish, eggs and dairy. A healthy diet provides enough vitamin B12, although vegetarians, vegans, the elderly or those with vitamin B12 absorption difficulties may have deficiencies. Symptoms of vitamin B12 deficiency include fatigue, weakness, swelling or numbness and tingling in the hands and feet, inflammation of the stomach and involvement of the nervous system.

Numerous genetic studies have identified a marker in the FUT2 gene that is associated with low levels of vitamin B12 in blood, however, this does not mean that your levels are not adequate. This effect could be due to a reduced absorption of the vitamin in the intestine.

Your genetic map

Gene	Genotype
FUT2	AG

What does your genetic say?



You are predisposed to have low levels of vitamin B12. It is important that you take foods rich in vitamin B12, especially if you are older than 50 years.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2773275/>



Vitamins and minerals

Vitamin C

Vitamin C (ascorbic acid) is a water-soluble compound, critical for many vital processes: it is essential for the functioning of the immune system, the production of red blood cells, the maintenance of connective tissue and blood vessels, bones, teeth and gums. It is a potent antioxidant and participates in the absorption of iron. Some foods rich in vitamin C are lemons, oranges, red pepper, watermelon, strawberries and citrus juices. While a severe deficiency causes scurvy, variations in vitamin C levels have been associated with a wide variety of complex chronic diseases, such as arteriosclerosis, type 2 diabetes or cancer. High levels of vitamin C have been associated with increased vitality, longevity, and reduced risk of death from cardiovascular disease or cancer.

Vitamin C is transported across the cell membrane via transport proteins, one of which is SLC23A1. A recent study of about 15,000 people has found that the T allele variant in SLC23A1 is associated with low circulating vitamin C levels.

Your genetic map

Gene	Genotype
SLC23A1	CC

What does your genetic say? 

Your genotype is associated with normal levels of vitamin C.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605792/>



Vitamins and minerals

Vitamin E

Vitamin E is a fat-soluble micro-nutrient formed by a group of eight molecules, with α -tocopherol being the most abundant. It acts as an antioxidant helping cells to protect themselves from damage caused by free radicals. It is essential for the functioning of the immune system, beneficial for cardiovascular health, prevents cataracts, age-related macular degeneration and fatty liver. It is also essential for the skin because of its anti-inflammatory and photo-protective properties. Imbalances in vitamin E levels are relatively common and are caused by diets that do not include enough healthy fats, malabsorption disorders and / or genetic variations. The synthetic varieties of vitamin E found in fortified foods and supplements are biologically less active.

A genetic research has found an intergenic marker, near the APOA5 gene, associated with increased levels of vitamin E.

Your genetic map

Gene	Genotype
near APOA5	CC

What does your genetic say?

Your genotype is not associated with increased levels of α -tocopherol and therefore you should optimize your intake of vitamin E by increasing the consumption of foods rich in it. Keep in mind that many adults do not normally eat adequate amounts of vitamin E daily.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2668002/>



Vitamins and minerals

Vitamin K

Vitamin K is a group of fat-soluble vitamins essential for promoting proper blood clotting and bone health. Numerous investigations indicate that an optimal intake of vitamin K contributes to a greater longevity. Vitamin K plays a protective role against various modern diseases such as arteriosclerosis, osteoporosis, diabetes and some types of cancer. Low levels of vitamin K increase the risk of bleeding, calcification of blood vessels and bone fracture. Vitamin K is often used to treat varicose veins, bruises, scars, burns, as they accelerate healing. Dietary sources richest in vitamin K include vegetable oils and green leafy vegetables.

Genetic variations have been reported that contribute to imbalances in vitamin K levels; in fact, some variants have been associated with increased levels while others have contributed to lower levels.

Your genetic map

Gene	Genotype
VKORC1	GG
VKORC1	CC

What does your genetic say?



Your genotype is associated with normal levels of vitamin K.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2761647/>



Vitamins and minerals

Vitamin B9

Vitamin B9 (folic acid) is essential for vital processes like DNA synthesis, cell maintenance and repair, protein metabolism and normal brain development and functioning. It can lower levels of homocysteine in the blood, a substance related to cardiovascular disease if it is at high levels. It is very important in pregnant women and those who try to conceive because it prevents defects in the neural tube and cardiovascular malformations in the fetus. Vitamin B9 is found in many foods like green leafy vegetables, peas, lentils, fruits and cereals. Vitamin B9 deficiencies are associated with anemia, elevated levels of homocysteine, complications during pregnancy, increased risk of cardiovascular disease, increased risk of cancer, and cognitive dysfunction in old age.

Certain genotypes may predispose to low levels of Vitamin B9.

Your genetic map

Gene	Genotype
MTRR	AG
MTHFR	TG
MTHFR	GG

What does your genetic say?



You have a high risk of high levels of homocysteine and low levels of vitamin B9, so you should monitor folic acid levels by increasing the consumption of foods rich in it or taking supplements to lower homocysteine levels.

More information:

[http://www.atherosclerosis-journal.com/article/S0021-9150\(00\)00739-5/fulltext](http://www.atherosclerosis-journal.com/article/S0021-9150(00)00739-5/fulltext)



Vitamins and minerals

Vitamin D

Vitamin D is a fat-soluble vitamin important for the absorption and utilization of calcium, to maintain good bone and muscle health, for the normal functioning of the immune, endocrine and cardiovascular system. It is synthesized on the skin after exposure to sunlight: it is metabolized to its active form, which regulates hundreds of genes thanks to binding to the vitamin D receptor. There is an increase in cases of vitamin D deficiency in developed countries due mainly to photo-protection measures, as well as environmental conditions (contamination, geographical location), dark skin color, being over 50 years, family history of osteoporosis, overweight and personal genetics. Exposure to sunlight is a determining factor in a person's vitamin D levels, because there are few dietary sources of vitamin D, which include fatty fish, fish liver oil and milk or fortified cereals.

Numerous studies have identified genetic variations in many genes that contribute to vitamin D deficiency.

Your genetic map

Gene	Genotype
GC	AA
CYP2R1	AG
VDR	CC
VDR	AC
VDR	AA

What does your genetic say?



You are predisposed to have low levels of vitamin D, but the binding and transport of this vitamin are normal, so we recommend that you increase the consumption of foods rich in vitamin D to achieve optimal levels.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3939005/>



Vitamins and minerals

Calcium

Calcium is the most abundant mineral in the human body and the main component of bones and teeth. It plays a central role in the functioning of the nervous system and muscles, controls the blood vessels and the secretion of insulin. It is important to have enough calcium because a long-term deficiency can lead to loss of bone mass and osteoporosis. Calcium levels are tightly regulated and requirements increase with age: from 50 years on in women and 70 on men. The benefits of an adequate daily intake of calcium are: reducing the risk of osteoporosis, regulating blood pressure and reducing the risk of some types of cancer. The human body does not produce calcium so you have to ingest it through food. Too high blood levels (hypercalcemia) are not healthy either because they can weaken bones and cause problems in the kidneys, heart and brain.

There are genotypes that predispose us to low blood calcium levels.

Your genetic map

Gene	Genotype
CASR	TG
CASR	AA

What does your genetic say?

Your genotype indicates that you are predisposed to have normal blood calcium levels.

More information:

<https://www.ncbi.nlm.nih.gov/pubmed/15531522>



Vitamins and minerals

Iron

Iron is an essential mineral for many functions of our body. It is part of many proteins, including oxygen carriers, hemoglobin (in red blood cells) and myoglobin (in muscle cells). It is also an essential component of antioxidant enzymes. The absorption, transport and storage of iron is closely regulated, because it is an essential and potentially toxic element.

Iron deficiency is the most common nutritional deficiency in the world. Symptoms include fatigue, rapid heartbeat, and palpitations. Children and women of childbearing age, vegetarians and vegans, are people at high risk of iron deficiency. Although it is an essential mineral, too much iron can be harmful to the body.

Some genetic variations increase the absorption of the iron giving rise to an excess of this mineral, in spite of ingesting normal amounts. At least one in 10 people has a genetic variation of this type. Excess iron can lead to fatigue, anorexia, dizziness, nausea, vomiting, headache, weight loss and shortness of breath.

Your genetic map

Gene	Genotype
TMPRSS6	AA
TMPRSS6	AG
TF	AG
ABO	TC

What does your genetic say?



You are predisposed to have low levels of iron due to deficiencies in its transport, storage and release, so you must monitor your levels and adjust your intake (food or supplementation) to reach the appropriate levels.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4003547/>



Metabolic

Cholesterol LDL

Low-density lipoprotein (LDL) is the type of cholesterol that can be dangerous if there are high levels. LDL cholesterol can form plaques and build up in the walls of the arteries, which can narrow and make these arteries less flexible, increasing the risk of cardiovascular disease (heart attack, atherosclerosis, angina). Optimal levels of LDL cholesterol are less than 100 mg / dL. Near the optimum levels would be the range 100-129 mg / dL and medium-high levels of 130 to 159 mg / dL. Levels higher than 160 mg / dL are high and above 190 mg / dL are very high.

Genetic results indicate the likelihood of having high LDL levels. If your risk is low, you have a probability less than the average population. However, you may have problems with LDL levels as a result of your diet and other factors. Processed foods rich in trans fat contribute to increased LDL levels. Genetic variants in various genes have been linked to LDL cholesterol levels.

Your genetic map

Gene	Genotype
ABCG8	TT
APOB	CC
CELSR2	GG
HMGCR	CC
HNF1A-AS1	CC
TIMD4	CG
LDLR	TG
LOC10272496	TC
SUGP1	TC
PCSK9	TT

What does your genetic say?



Your genetic profile indicates that you share the genotype with people whose LDL levels are close to optimal.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2881676/#SM>



Metabolic

HDL cholesterol

High-density lipoprotein (HDL) is also known as good cholesterol, because high levels of HDL cholesterol appear to protect against heart disease, while low levels (below 40 mg / dL) increase the risk of coronary heart disease.

The main mechanism by which this occurs is the role of HDL by transporting excess cholesterol from the arteries to the liver. In men, typical levels of HDL are 40-50 mg / dL.

In women, the female hormones cause HDL levels of 50-60 mg / dL, however, after menopause there is a tendency to decrease these levels. Foods that contain trans fats can lower HDL levels, which is not healthy.

Variants in various genes have been associated with blood levels of HDL, which contribute cumulatively.

Your genetic map

Gene	Genotype
ABCA1	TT
RAB11B	TC
CETP	CC
FADS1	CC
GALNT2	AG
HNF4A	CC
KCTD10	CC
NUTF2	GG
LIPC	TT
LIPG	TT
LPL	AA
TTC39B	TT
ZPR1	CC
CETP	CC

What does your genetic say?



You have a higher propensity to have low HDL levels (less than 40 mg / dL). You should control your blood HDL levels.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2881676/>



Metabolic

Triglycerides

Triglycerides are chemically fats that build up in your body.

People with elevated triglycerides have an increased risk of cardiovascular disease and type 2 diabetes.

Having high triglyceride levels is often associated with conditions such as lack of exercise, excessive alcohol consumption, smoking, excessive consumption of refined carbohydrates and overweight. Normal levels are below 150 mg / dL, the mid-high range is between 150 and 199 mg / dL, above 200 mg / dL are considered high levels and more than 500 mg / dL are very high.

Scientific studies have shown that variants in various genes that affect lipoprotein metabolism are associated with triglyceride levels.

Your genetic map

Gene	Genotype
DOCK7	AA
APOB	AG
FADS1	CC
LPL	AA
BAZ1B	AA
CILP2	TC
TRIB1	AA
XKR6	AA
ZPR1	CC

What does your genetic say?

You are more likely to have elevated triglycerides (above 150 mg / dL). You should monitor your blood triglyceride levels.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2881676/>



Your senses

Bitter taste

Our taste perception plays a fundamental role in our preferences and eating habits, creating aversion or impulse towards certain foods and drinks. An adverse response to the bitter taste is instinctive and leads us to reject it. The perception of bitter taste is due to genetic variations in various receptors: when we ingest food, molecules such as phenylthiocarbamide interact with saliva and bind to taste receptors in the mouth, giving the sensation of bitter taste.

People with certain genetic variants are sensitive to the bitter taste of beneficial vegetables (such as broccoli, Brussels sprouts, cabbage, cabbage) or drinks (such as coffee and black beer). There is evidence that genes responsible for taste play an important role in human health. A new study has found that people who are more sensitive to bitter taste naturally are also more likely to add salt to food, often exceeding the recommended amount. In addition, these people are more likely to avoid healthy foods like green leafy vegetables and broccoli.

Your genetic map

Gene	Genotype
TAS2R38	CG
TAS2R38	AG
TAS2R38	TC
TAS2R16	TC

What does your genetic say?



Your genotype is not associated with a greater sensitivity to bitter taste, so you will not have problems when eating vegetables and other foods with this flavor.

More information:

<http://ajcn.nutrition.org/content/81/5/1005.long>



Your senses

Pecking

Pecking can be a healthy or unhealthy behavior. Balanced foods containing unsaturated fats, proteins, fiber, and low-glycemic carbohydrates in small portions can help quench hunger and reduce total calorie intake, while junk food can have negative health effects.

Genetic markers associated with pecking include leptin receptor variants, an essential hormone in the regulation of food intake. Some people feel hungry more often than others, which leads them to eat impulsively and to an increased risk of being overweight.

Variations in the LEPR (leptin receptor) and FTO gene have been associated with a greater impulse to eat between hours.

This association has not been studied in men. This section is only valid for women.

Your genetic map

Gene	Genotype
LEPR	AG
FTO	TT

What does your genetic say?



You do not have a special predisposition to eat between hours.

More information:

<https://www.ncbi.nlm.nih.gov/pubmed/17192493>



Your senses

Sweet

Sweet taste detection is mediated by taste receptors for this taste.

Culinary culture, habits and your age influence your food preferences, and your genetics also play an important role in this regard.

Genetic variants in various genes predispose to a greater preference for sweet taste.

Intake of healthy foods with a sweet taste (present naturally) can help satisfy this desire without necessarily increasing daily calories. However, excessive craving for processed sweet foods can harm our health and increase our daily calorie intake.

Your genetic map

Gene	Genotype
TAS2R38	CG
TAS2R38	AG
TAS2R38	TC
FGF21	AG

What does your genetic say?

You have a preference for carbohydrates but not too much. Avoid processed sweet foods to take care of your weight and your health.

More information:

<http://ajcn.nutrition.org/content/81/5/1005.long>



Your senses

Caffeine

The enzyme cytochrome P4501A2 is primarily responsible for metabolizing caffeine. People depending on their genotype may be rapid metabolizers, or they may metabolize caffeine more slowly.

People with normal metabolism take about 45 minutes to absorb 99% of caffeine. In humans, the half-life of caffeine is between 4 and 6 hours, which explains why the effect of drinking coffee lasts that long.

However, genetic variations that modify the metabolism of caffeine may create hypersensitivity to this substance. These people react to very small amounts of caffeine, even at amounts below 100 mg, and may experience symptoms of overdose such as insomnia, nervousness and increased heart rate. These people may take more than twice as much time to metabolize caffeine.

Your genetic map

Gene	Genotype
CYP1A2	CC

What does your genetic say?



Your genotype is associated with a slow metabolism of caffeine, so you may have overdose symptoms. Limit consumption of soft drinks with caffeine, coffee, black tea, etc. and choose low caffeine drinks.

More information:

<http://www.geneticsmr.com/articles/6221>



Your weight and you

Predisposition to overweight

Obesity is caused by environmental factors and genetic factors. Approximately 40 to 70% of the predisposition to obesity is inherited. When someone reaches a body mass index (BMI) of 30 to 35 (obesity) or above 40 (morbid obesity), genetic factors with a strong effect are most likely involved. Your genetic predisposition to obesity is determined by your genotype in variants of the FTO and MC4R genes, which are associated with a higher BMI. The MC4R gene is expressed at the center of brain starvation and is involved in the regulation of energy balance. The FTO gene is important in controlling eating habits and energy balance.

On the other hand, adiponectin is a hormone produced by adipose cells. In the body causes the liver and muscles to consume energy from fat. High levels of adiponectin are beneficial for weight loss. If you have low levels, losing weight can be a good way to increase your adiponectin levels. A variant of the adiponectin gene (ADIPOQ) is associated with its levels.

Your genetic map

Gene	Genotype
FTO	TT
MC4R	TC
ADIPOQ	GG
ADRB2	GC
FTO	TT

What does your genetic say?

You are more likely than the rest of the population to have a high BMI (body mass index), which does not mean that you are obese. However, because lifestyle has a considerable impact on weight, you can reduce your risk by leading a proper diet, exercising and reducing your stress.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2695662/>



Your weight and you

Eating desire

Although there is no objective method to quantify the desire to eat or taste for a particular type of food, behavioral scientists have devised techniques to measure individual motivation to consume food and compare it among different people. This measure, called food reinforcement value, describes how much effort a person is willing to make to get a particular food. This value can be determined through a series of laboratory tests. In each, the individual who is being tested is asked to complete a task in exchange for a small portion of their favorite food. The homework on the initial test is easy, so the food is not hard to get. As the test continues, the tasks are becoming more complicated and, in a moment, the participant feels that the effort to get the food is not worth it and decides to leave it.

Using these techniques, a study has identified a genetic component associated with the desire to eat.

Your genetic map

Gene	Genotype
ANKK1/DRD2	GG

What does your genetic say? 

Its genotype is associated with normal values of food reinforcement.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2213752/>



Your weight and you

Feeling of Satiety

Satiety refers to the physical sensation of feeling full when eating. When satiety is normal, the brain receives a signal that it has been eaten enough, thus reducing hunger.

People with genetic variations in some genes like FTO are more likely to eat more without feeling full and satisfied.

The FTO gene is an important factor that predisposes you to having a healthy or unhealthy weight. There is also a correlation between low satiety and weight gain. People with low levels of satiety tend to eat more and consume foods rich in sugar and fat. To improve satiety, you can increase the amount of dietary fiber and eat balanced and healthy foods throughout the day. Examples of high fiber foods include whole wheat bread, oats, barley, lentils, black beans, artichokes, raspberries and peas.

Your genetic map

Gene	Genotype
FTO	TT

What does your genetic say? 

Your genotype indicates that your feeling of satiety is normal.

More information:

<http://ajcn.nutrition.org/content/90/5/1426.long>



Your weight and you

Emotional eating

Emotional intake, or loss of control over intake, describes the tendency to eat more than normal in response to stimuli such as the taste of food or situations that trigger overeating, such as emotional stress, emotional states negative (anger, anxiety) or certain social situations.

Some studies indicate that certain genetic variation in the TAS2R36 gene, responsible for the detection of bitter taste, makes some people more likely to eat compulsively under certain moods.

It seems that this mechanism is mediated by the endocannabinoid system of our body, which regulates the energy metabolism influencing the appetite.

Your genetic map

Gene	Genotype
TAS2R38	AG

What does your genetic say?



Your genotype is not associated with increased intake for emotional reasons.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4179166/>



Your weight and you

Difficulty losing weight

Not all people lose weight at the same speed. Some lose light weight a week to start a low calorie diet, while others try to follow all types of diets without having great results.

There are studies that indicate that genetics is, in part, responsible for the difficulty of losing weight. Some studies have found that carriers of certain genetic variations have more difficulty losing weight and improving their metabolic status. People with genetic variants associated with obesity, sensitivity to fat, type 2 diabetes and emotional intake do not lose weight as easily as other people despite following the same diet and performing the same exercise. It is important to remember that genetics plays a role in weight loss and maintenance. Some diseases and medication can also prevent weight loss. The most common are hypothyroidism, hormonal changes in women, chronic stress and depression.

Your genetic map

Gene	Genotype
TCF7L2	CC
PPARG	CC
PPM1K	TT
MTNR1B	CG
CLOCK	AA

What does your genetic say? 

Your difficulty in losing weight is intermediate. Follow a diet that is right for you and exercise to reduce your weight.

More information:

<http://ajcn.nutrition.org/content/91/2/472>



Your weight and you

Effectiveness of the Mediterranean Diet

The benefits of the Mediterranean diet for health are well known. Numerous studies have associated the follow-up of a Mediterranean diet with a low risk of obesity. In a study of more than 11,000 participants, it has been observed that people who most followed this diet lost more weight and reduced their waist more than the rest. The Mediterranean diet is rich in vegetables, fish, fruit, legumes, nuts and olive oil, while meat and dairy products are minor components. Taking into account the interaction between diet and personal genetic predisposition to obesity we can know how effective this diet is for each person.

Genetic variations in various genes have been associated with greater weight loss by following a Mediterranean diet, ie, people with certain genetic variations in genes like PPARG, among others, the Mediterranean diet helps them to lose fat.

Your genetic map

Gene	Genotype
PPARG	CC
TCF7L2	CC

What does your genetic say?



Your genotype does not benefit especially from this type of diet to lose weight.

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3951915/>



Your weight and you

Effectiveness of the Low Fat Diet

According to the World Health Organization, in a balanced and healthy diet it is recommended to reduce total fat consumption to less than 30% of daily calorie intake. In addition, it is advisable to reduce the consumption of saturated fats to less than 10% of daily caloric intake and replace those fats with unsaturated fats (mono and polyunsaturated).

A low-fat diet restricts fat intake to 20% while increasing protein intake from 20-25% to 40%, and decreases the proportion of carbohydrates (whose general recommendation is 55-60%).

Numerous large-scale studies on weight loss have found that people with variations in genes associated with fat sensitivity (such as FTO, PPARG, PPM1K) respond best to a low-fat diet.

Your genetic map

Gene	Genotype
FTO	TT
FTO	CC
PPM1K	TT
NEAR IRS1	TC
QPCTL	TC

What does your genetic say?

Your genotype indicates that you have a greater genetic predisposition to lose weight and stay at a healthy weight if you follow a low-fat diet. For this we recommend reducing the fat intake to 20% and increasing the proportion of proteins and carbohydrates. It is important to include healthy fats (mono and polyunsaturated).

More information:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4959911/>



Your weight and you

Effectiveness of the Low Carbohydrate Diet

Carbohydrates are the main source of energy in a diet, accounting for between 45% and 55% of the daily intake. They are the macronutrients from which we get the energy our body needs. Simple carbohydrates give us immediate energy while the complexes ensure an energy supply throughout the day. Simple carbohydrates are found mostly in fruits; the complexes, in vegetables, cereals and legumes. Do not forget that they are a source of fiber, an essential component in our diet and very important for intestinal health. Slimming diets typically reduce the amount of carbohydrate and increase protein, but not all people respond equally to this reduction.

It has been observed that a polymorphism in the FTO gene, linked to obesity, is related to a better response to low carbohydrate diets.

Your genetic map

Gene	Genotype
FTO	TT

What does your genetic say?

Your genotype is associated with greater weight loss if you follow a low carbohydrate diet.

More information:

<http://ajcn.nutrition.org/content/90/5/1418.long>



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