ID: 0000000000

Genetics for people

Genetic Testing
Nutrigenetics

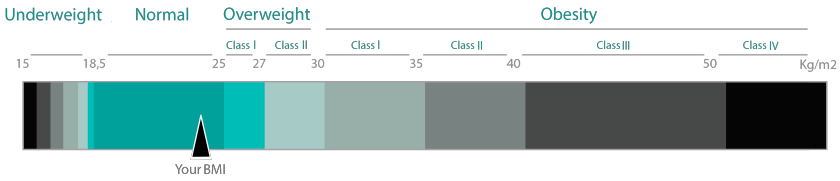
My Diet

Below we show you your anthropometric data. meaning, those derived from the measurement of your body, along with your Body Mass Index (BMI)*, all of which are necessary to correctly assess your nutritional status:

ANTHROPOMETRIC DATA

Gendre: Man
Age: 24
Weight: 58 kg
Height: 155 cm
BMI: 24.1 kg/m^2
Physical Activity: Mild

Body Mass Index (BMI) kg/m^2



0.25 **Currently, BMI is recommended and accepted for clinical use by various societies and national and international health organisations. Still, its limitations, such as in the case of athletes where muscle mass predominates or minors where BMI is adjusted based on percentiles. This is because it does not take into account several parameters such as age, sex or body fat percentage, among others.*

GENETIC PREDISPOSITION FOR:

GAIN WEIGHT

Evolution has favoured the emergence of genetic variants that increase fat accumulation to increase survival during scarcity. However, today's lifestyle predisposes these variants to overweight and obesity. These genetic factors comprise a set of genes related to the regulation of appetite and satiety and the detection of macronutrients: fats, carbohydrates, and proteins.

LOSE WEIGHT

Evolution, in turn, favoured those genetic variants that reduced energy expenditure during exercise while maintaining fat stores. Today, the effect of these variants involves less fat mobilisation, both in basal metabolism and in response to physical activity. In addition, a large number of physiological processes are involved in weight loss, such as the sensation of gluttony or sleep schedules, among others.

Nutrigenetics is a field of genomics that investigates the influence of certain genetic variants on the metabolism of nutrients, diet and diseases associated with it. **Why don't you get the same results when doing the same diet or sports routine as a family member or friend?** Nutrigenetics tries to answer this question by identifying the DNA changes that differentiate your response to the same dietary or sports plan. **We all share 99.9 % of genetic information, but that 0.1 % makes a difference and makes us unique.**

The susceptibility of each person to gain or lose weight, the effectiveness of sport for weight loss or the predisposition to suffer from a disease related to nutrition, such as type II diabetes, hyperlipidaemia or heart disease, is determined by the physiological profile of each person and his/her genetic predisposition. Below we show you your genetic predisposition for each of the categories analysed:

SUMMARY OF RESULTS:

PERSONALISED NUTRITION

BIOLOGICAL CLOCK

PHYSICAL ACTIVITY

HEALTH AND NUTRITION

1. PERSONALISED NUTRITION

Knowing your genetic profile will help you personalise your nutritional plans more precisely and acquire a healthier lifestyle. **This is because genetics influences the processes of assimilation and use of macronutrients: fats, carbohydrates and proteins.** Thus, when the sensors for these macronutrients do not behave properly, the brain essentially disconnects from the stomach and makes you think you are hungry when you are not. It also drives cravings and intake of low-nutrient foods that, once consumed, are easily converted to fat.

Here's a look at your genetic predisposition for fat, carbohydrate and protein metabolism, as well as your tendency to eat. The combination of these physiological characteristics will determine the ideal nutrient distribution for weight loss and weight maintenance, which you can see in the section YOUR DIET IN DETAIL:

Fat metabolism

Carbohydrates metabolism

Protein detection

Gluttony

Genes analyzed	
ACE	GNB3
ADRB2	MC4R
ADRB3	NPY
APOA2	PLIN1-1
APOA5	PLIN1-2
DRD2	PGC1A
FABP2	PPARA
FTO-1	PPARG
FTO-2	TAS1R2
FTO-3	TCF7L2
GLUT2	UCP2

1.1. FAT METABOLISM

The process by which fats are digested and assimilated for later use as a source of energy or heat is known as **fat metabolism**. This is a complex process that ranges from the consumption and detection of fats after being ingested followed by their transport and uptake in the intestine to the formation of adipose tissue or fatty tissue (**adipogenesis**) and finally their degradation into simpler compounds for use as a source of energy (**lipolysis and beta-oxidation**) or heat (**thermogenesis**). The alteration in some of these processes leads to the development of metabolic and cardiovascular disorders, such as obesity or diabetes.

Conclusion on your fat metabolism:

Mr. you may have an increased need to eat high-fat foods, particularly saturated fats, especially under stressful situations. This is because you have **altered the detection and transport of fats** .
About fat burning, you have a **less efficient profile for generating heat and burning fat at rest (thermogenesis)**.
Also, you have a genetic variant (in the PLIN1 gene) reported to be linked to **increased difficulty in losing weight through dieting**, especially if you are obese or overweight.

Here's the strategy to follow to offset your fat metabolic profile and achieve your goals:

Reduce excess weight to reach a healthy weight and try to maintain it. To achieve your goal in body weight management, try to be **more consistent in following your nutritional plan and practice physical exercise** with moderate to high intensity.

1.2. CARBOHYDRATE METABOLISM

Carbohydrates are the primary energy source for the body. They are classified as complex (starches, found in certain vegetables, pasta or cereals) and simple (sugars, found in desserts, processed foods or soft drinks). Ingested complex carbohydrates are converted into simple carbohydrates to obtain energy. The digestion and use of carbohydrates or sugars are called **carbohydrate metabolism**. As in fats, this process involves the detection, capture and transport of sugars, and an alteration in any of these processes can lead to the dysregulation of the sensation of appetite and satiety and a greater tendency to consume sweet foods and to snack between meals.

Conclusion on your carbohydrate metabolism:

in your case, **you do not have a significant alteration in carbohydrate metabolism**, but you do have a genetic variant that could slightly alter the tendency to consume sugars and sweets. This is because you have some genetic variants that may condition you to eat more carbohydrates.

The **Glycemic Index** is the value assigned to foods containing carbohydrates. It indicates how quickly their digestion can raise blood sugar (glucose) levels. Eating carbohydrates with a low Glycemic Index avoids sudden spikes in blood sugar and reduces the risk of cardiovascular disease. In your case, En tu caso, try to reduce **the consumption of foods with a high Glycemic Index**. To help guide you, here is a table with the Glycemic Index. It contains the most common foods and the recommended frequency of consumption to help you maintain balanced blood sugar levels (glycemia).

FOODS WITH HIGH GLYCAEMIC INDEX (very occasional consumption)	FOODS WITH INTERMEDIATE GLYCAEMIC INDEX (moderate consumption)	FOODS WITH LOW GLYCAEMIC INDEX (frequent consumption)
Foods derived from white or refined flours such as white bread, sweeteners (white or brown sugar, molasses, panela, honey, syrups), some cooked vegetables such as carrots or celery, beer, mayonnaise and ketchup, cereals and non-whole grains rice, mashed potato or baked potatoes and some fruits such as papaya, melon, watermelon or ripe banana.	Most fruits (pineapple, peaches, khakis, kiwi, lychee, grapes, banana, mango etc.) and natural juices (without added sugar), whole wheat flour, brown rice, muesli, couscous and sweet potatoes, potatoes or pumpkins.	This group includes fresh legumes, meat and fish, seafood, eggs, oil and margarine, red fruits (cranberries, strawberries, currants, blackberries etc.) and citrus fruits, dried fruits, dairy products, most vegetables, as well as dark chocolate, coffee, and tea.

1.3. PROTEIN DETECTION

The correct functioning of the amino acid sensors, the most fundamental part of proteins, **is essential for the hormonal regulation of the sensation of appetite and satiety**.

Conclusion on your protein detection:

You **present a genetic alteration in the detection threshold of proteins**, which affects the hormonal regulation of appetite and predisposes you to higher food intake and sedentary lifestyles. To reduce the sensation of appetite, we recommend **increasing the percentage of proteins in your diet**, the intake of foods such as soybeans, lentils, chickpeas, liver, prosciutto, sausage loin, tuna, cod, prawns or egg white in an appropriate amount being recommended.

1.4. GLUTTONY

The dopaminergic system is involved in numerous cellular activities including behaviour, synthesis and release of hormones and controls motor function, endocrine function, the retinal system, the reward system, and cognition. Chemically, dopamine stimulates hormones related to happiness, pleasure, libido, appetite and body metabolism in addition to the stimulation of other processes such as memorization. An alteration in the dopaminergic system is related to a greater susceptibility to suffering some type of eating disorder (ED) such as impulsivity for food or a tendency to eat in the face of negative emotions.

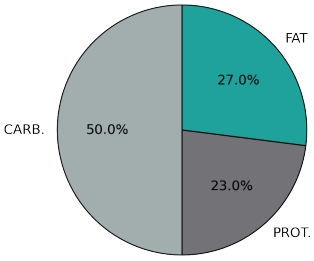
Conclusion on your gluttony predisposition:

In your case, you do not present a greater susceptibility to suffering some type of eating disorder (ED) such as impulsivity for food or a tendency to eat in the face of negative emotions, genetically mediated by the dopaminergic system. **Take advantage of this benefit to avoid eating for the sake of eating, responding by eating to emotional stimuli, or snacking between meals**. Despite not having a genetic predisposition, if you suspect that you may have some type of eating disorder, it is recommended that you talk to a specialist.

YOUR DIET IN DETAIL

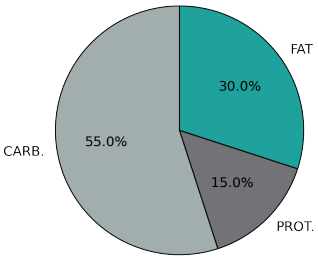
Below we show you the **distribution of macronutrients (proteins, carbohydrates and fats) that best suit your genetic and physiological profile**. You have two distributions: the stricter one focused on weight loss and the other on weight maintenance. Hence, you can always follow it and maintain a balanced weight. In addition, on the next page, you will find a table with examples of foods rich in the different types of macronutrients to guide you.

ACCORDING TO YOUR GENETIC PROFILE



Macronutrient distribution adjusted by your genetic profile.

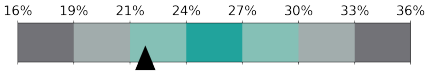
ACCORDING TO THE GENERAL RECOMMENDATION



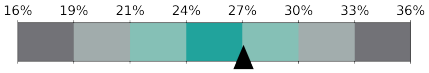
Macronutrient distribution recommended by the World Health Organisation (WHO).

DISTRIBUTION OF YOUR CARBOHYDRATES:

SIMPLE CARBOHYDRATES

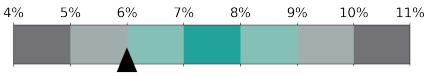


COMPLEX CARBOHYDRATES

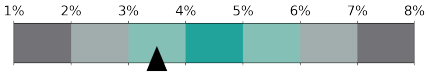


DISTRIBUTION OF YOUR FATS:

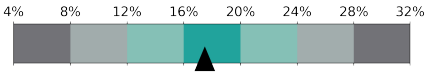
SATURATED FATS



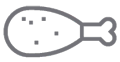
POLYUNSATURATED FATS



MONOUNSATURATED FATS



PROTEIN



Present in white fish (sea bream, sea bass, hake, sole etc.), blue-fish (tuna, emperor, salmon, mackerel, herring, trout etc.), red meat rich in amino acids (lamb chop, pork cutlet, rabbit, sirloin of beef, lamb or pork, horse or deer meat, cooked ham, minced meat etc.), low-fat white meat (turkey, chicken or duck breast), low-fat seafood (lobster, crabs etc.), eggs, dairy products and ve-getables.

CARBOHYDRATES

Simple

Present in refined sugars, brown sugar, molasses, honey, fructo-se (present in fruits) and lactose (present in dairy products). In addition, all processed products usually contain a large amount of sugars.

Complex

Present in whole grain bread (whole grains), pasta, legumes, starchy vegetables (potatoes or peas) and high fibre foods (who-le grain cereals such as oatmeal, brown rice or quinoa).

FATS

Saturated

Present in foods deriving from animal fats (fatty meats, butter, buttercreams), coconut oil, palm oil, chocolate and pastries and bakery products.

Polyunsaturated

Present in bluefish (sardine, salmon, anchovy, mackerel, trout etc.), seed oil (sunflower, corn, peanut etc.) and nuts.

Monounsaturated

Present in nuts (hazelnuts, almonds, peanuts, walnuts), olives, avocado, olive, rapeseed and soybean oil.

YOUR DIET IN DETAIL

Micronutrients are essential elements for people, required in small amounts throughout life to perform a range of metabolic and physiological functions in order to stay healthy. Vitamins and minerals are considered micronutrients, and daily requirements for micronutrients are in amounts generally less than 100 milligrams, while macronutrients are required in grams.

Vitamins:

	General recommendation		Your recommendation	
B12 Vitamin	**2-2,4** *µg/day*	↑	**2,6-3** *µg/day*	Only present in foods of animal origin (meat, fish, eggs and dairy products).
B9 Vitamin Folic Acid	**320-400** *µg/day*	↑	**600-800** *µg/day*	60 % is found in vegetables, mainly green leafy vegetables and dried fruits, while the remaining 40 % is found in meat and dairy products.
C Vitamin	**75-90** *mg/day*	=	**75-90** *mg/day*	Present in citrus fruits, fruits such as strawberries or currants and kiwi and in vegetables of intense color.
E Vitamin	**12-15** *mg/day*	=	**12-15** *mg/day*	Mainly present in foods of plant origin, vegetable oils, dried fruits and whole grains. To a lesser extent, it is found in leafy green vegetables.

Minerals:

	General recommendation		Your recommendation	
Magnesium	**350-420** *mg/day*	↑	**430-470** *mg/day*	Present in dried fruits, whole grains and dark chocolate.
Sodium	**2-2,3** *mg/day*	=	**2-2,3** *mg/day*	It is found in common salt.
Zinc	**9,4-11** *mg/day*	=	**9,4-11** *mg/day*	Present in beef, chicken, oysters and crab.

2. BIOLOGICAL CLOCK

The **circadian rhythm** regulates changes in physical and mental characteristics based on our environment and environmental changes. An example of this is the synchronization of sleep in the absence of light.

The **biological clock** of each organism is in charge of controlling most of the circadian rhythms, and they influence activities as essential as the regulation of sleep or the timing of meals. There are several genes that are related to the correct functioning of our biological clock, and that determine its activity. On a nutritional level, a disturbance of the biological clock directly affects the metabolism of fats and therefore favours their accumulation. To avoid this, you need to have a regular schedule for eating and sleeping.

Genes analyzed
PLIN1
CLOCK

Conclusion about your circadian rhythm and biological clock:

Genetically, **you are a nocturnal person**. Nocturnal people tend to sleep worse and rest fewer hours than people with daytime habits. This directly influences the amount of fat accumulated in the body because one of the times when the body burns more fat is during night rest. **Try to have regular hours, go to bed early, and sleep a minimum of 8 hours to increase the effectiveness of your weight loss diet and reduce the risk of obesity and overweight**.

On the other hand, **you have a genetic predisposition to have an alteration in the local circadian rhythm of the fatty adipose tissue**, affecting the metabolism of fats. In your case, **you should try to eat meals regularly at the same time and, if possible, at early hours. This will increase the effectiveness of the diet for weight loss**.

3. PHYSICAL ACTIVITY

Genetics are involved in the effectiveness of weight loss or weight maintenance through physical activity. Some people find it easier to obtain energy by burning fat during physical activity, while others have more difficulty. This is influenced by the genetic profile of each individual.
Regular physical exercise is essential to maintain a healthy body condition and weight.

Genes analyzed						
ADRB2	APOA5	FABP2	FTO-3	PGC1A	MC4R	PLIN1-2
ADRB3	CLOCK	FTO-1	GLUT2	PPARA	NPY	TCF7L2
APOA2	DRD2	FTO-2	GNB3	PPARG	PLIN1-1	TNFA

Conclusion on your sports profile:

Mr. you do not present any alteration of the mobilization of fats in response to physical exercise. Therefore, in your case, **practising regular physical exercise is beneficial to achieve your goals in body weight management**.

Here is your recommended physical activity to lose weight and keep it off based on your nutritional and athletic profile:

3 to 4 times per week 1 hour of aerobic exercise

Muscle consumes more energy than fat for normal functioning; the more muscle, the greater the fat burned at rest. In your case, due to your genetics, you have an impairment with heat generation and consequently with fat burning at rest (thermogenesis). Still, your aerobic exercise-mediated fat mobilisation to burn fat for energy is not affected. Therefore, to promote faster and more effective fat loss, we recommend 3 to 4 daily sessions of 1h of aerobic exercise (cardio).
In the case of maintenance, do 2 to 3 sessions combining aerobic (cardio) and anaerobic (muscle training) exercise to promote fat burning during physical activity and rest. Below is our sporting recommendation for you. Remember that this is not only influenced by your genetic predisposition in relation to sport, but there are also other genes related to fat burning that can affect this recommendation.

0.25 **NOTE:** The recommendation provided is intended for adults. However, children and adolescents are recommended to spend at least 1 hour per day in light to high-intensity physical activity. If physical exercise is new to you, we recommend starting with light-intensity exercise and gradually increasing the intensity.

MILD INTENSITY

Grade 1

Light walking, stretching routine, a yoga or swimming class for beginners, housework (cleaning the house, cleaning the car, yard work, gardening)

Grade 2

Walking 5.6 km/h, biking at 16 km/h, rowing machines 50 W, Tai Chi, water aerobics, golf, badminton

MODERATE INTENSITY

Grade 1

100W exercise bike, weight circuit, jogging, hitting the punching bag, hiking, light walking uphill 5.6Km/h

Grado 2

150W exercise bike, road or mountain biking, 150W exercise rowing machine, aerobics, brisk walk at 8 km/h, running, hockey, individual tennis, mountain climbing, freestyle swimming

HIGH INTENSITY

Grade 1

Running 9.6-12 km/h, cycling 22-26 km/h, butterfly, spinning, skating, soccer, rope jumping, climbing, boxing, judo

Grade 2

Cross country running, triathlon, cycling ≥ 32 km/h, 200W rowing machines, squash, kickboxing, CrossFit

NOTE: These exercises are for guidance only. The intensity of each activity varies depending on each person's fitness level. In addition, you can check your heart rate while doing the exercise using an activity tracker or smart wristband.

4. HEALTH AND NUTRITION

Obesity, diabetes and metabolic syndrome are chronic, multifactorial and interrelated diseases. Among the risk factors associated with these pathologies and other associated diseases are a sedentary lifestyle, inadequate diet, age and unfavourable genetics. Despite this, numerous scientific studies have shown that incorporating healthy lifestyle habits, such as regular physical activity and a healthy diet, can significantly reduce the risk of developing these diseases. It is essential to pay attention to these factors. These complications can lead to cardiovascular disorders, which are the leading cause of death worldwide. **Prevention is the most effective strategy to reduce the problems of these disorders.**

Throughout these pages, you will find your health status in relation to these pathologies based on your genetic predisposition, your Body Mass Index (BMI), your physical activity and your age:

Hyperlipidaemia

Cardiovascular diseases

Oxidative stress and inflammation

Genes analyzed	
ADRB2	GSTM1
ADRB3	GSTP1
APOA2	GSTP1
APOA5	MC4R
CAT	MNSOD
CLOCK	PLIN1-1
CYP1A2-1	PLIN1-2
CYP1A2-2	PPARG
FABP2	TCF7L2
GLUT2	TNFA

4.1. HYPERLIPIDAEMIA

Hyperlipidaemia is a **disorder that causes high levels of fats (or lipids) in the blood**. These fats include cholesterol and triglycerides, which are essential for the proper functioning of the body at normal levels but can cause cardiovascular diseases at high levels. The main cause of hyperlipidaemia is a diet rich in cholesterol and fats, but it is favoured by other risk factors such as being overweight or obese, lack of exercise, genetics as well as other diseases such as diabetes or hypothyroidism.

These are your results about your health status in relation to hyperlipidaemia:

Only taking into account your genetic predisposition:

Taking into account your weight, level of physical activity, age and genetics:

Mr. You have some genetic variants that slightly increase your chance of developing hyperlipidaemia. On the other hand, in relation to your BMI, it is not associated with an increased risk of blood fat levels.

To prevent hyperlipidaemia, try to keep your blood fat levels in line with the values in the table below:

DESIRABLE LEVELS OF FATS IN THE BLOOD	
Total cholesterol	<200 mg/dL
HDL cholesterol	>40 mg/dL in men and >50 mg/dL in women
LDL cholesterol	<100 - 130 mg/dL; for people with diabetes or heart problems, they should be <100 mg/dL
Triglycerides	<150 mg/dL

You can find more information about hyperlipidaemia at the following **link**.

4.2. CARDIOVASCULAR DISEASES

Cardiovascular disease is a broad term that covers problems with the heart and blood vessels. In many cases, these problems are due to atherosclerosis or accumulation of cholesterol in the walls of the blood vessels. The most commonly seen types of cardiovascular diseases include but are not limited to coronary heart disease (narrowing of the arteries) or myocardial infarction, heart failure (difficulty in pumping enough oxygenated blood to the body), arrhythmias (problems with the rate or rhythm of the heart), and hypertension (high blood pressure).

These are your results about your health status in relation to cardiovascular diseases:

Only taking into account your genetic predisposition:

Taking into account your weight, level of physical activity, age and genetics:

Mr. You have no genetic variants associated with an increased risk of developing cardiovascular disorders. On the other hand, having a BMI within healthy values reduces the chances of developing any cardiovascular disease.

CAFFEINE AND HEALTH STATUS

Caffeine is related to health status. It has been determined that the probability of suffering a myocardial infarction from drinking high doses of coffee increases considerably in slow metabolisers. However, in fast metabolisers, the trend is the opposite. Drinking one to three cups of coffee a day reduces their risk and has a protective effect.

Mr. in your case, you have a **slow metabolism of caffeine**, so you have an increased risk of cardiovascular disease due to excessive caffeine consumption. We, therefore, recommend limiting your caffeine intake to about 200mg per day, which is equivalent to about 2 cups of coffee per day.

You can find more information about cardiovascular diseases at the following **link**.

4.3. OXIDATIVE STRESS AND INFLAMMATION

Oxidative stress occurs when there is an imbalance between free radicals in the body and the antioxidants available to fight them. This process triggers an inflammatory response and **can cause associated health problems, such as cardiovascular problems, premature ageing etc.** Oxidative stress is enhanced by a wide variety of environmental agents such as diet, physical exercise, unhealthy habits such as smoking and alcohol, and it also has an important genetic component.

To counteract the harmful effects of an imbalance in free radicals, it is advisable to achieve a healthy weight and reduce total fat intake, increasing the consumption of unsaturated fats at the cost of reducing saturated fats. It is also advisable to increase the consumption of vitamins and fibre present in fruits and vegetables with antioxidant capacity.

These are your results about your health status in relation to oxidative stress:

Only taking into account your genetic predisposition:

Taking into account your weight, level of physical activity, age and genetics:

The genetic variants that predispose you to have efficient systems for regulating oxidative stress, and by extension, inflammation. So the enzyme systems that regulate free radical levels work efficiently. However, it is essential to maintain a varied and balanced diet that keeps free radicals in balance. Some recommendations that you can incorporate into your daily diet for this purpose are:

- **Eating five to nine servings of fruit and vegetables daily**, either raw or steamed. These foods are rich in vitamin C, E and coenzyme Q10, which will help regulate the increase in free radicals.
- Eating foods rich in **polyphenols** such as extra virgin olive oil, berries, green tea and pure chocolate; and foods rich in **quercetin** such as cherries, grapes, oats and garlic, among others.
- **Incorporating lycopene-rich foods into your daily diet** is another alternative to combat excess free radicals. Scientific studies reveal that lycopene is one of the substances with the most significant antioxidant power and can reduce cell damage to lymphocytes (white blood cells) by 42 %. It is found mainly in tomatoes and red fruits and vegetables such as papaya, apricots, watermelon...
- In addition, to boost the function of enzymes with antioxidant capacity, you should eat foods containing **selenium and riboflavin (vitamin B2)**, such as garlic, onions, eggs and salmon, and zinc, found in oysters, crab, beef and chicken.

Here is a list of foods that can help you regulate your oxidation levels. Discover your favourites and incorporate them into your daily diet to feel better.

You can find more information about oxidative stress at the following **link**.

CONCLUSIONS ABOUT YOUR HEALTH STATUS

Based on the parameters analysed, **your state of health for the pathologies analysed is good**, so you do not present a higher probability of developing any of them. Despite this, all these pathologies are multifactorial, so it is crucial to lead a healthy lifestyle. Here are a series of prevention guidelines that you can apply in your daily life:

- Maintain a healthy weight so that your risk is not increased. Find more information in the section on PERSONALISED NUTRITION.
- Increase your intake of vegetables, fruit, fish, wholegrain cereals and yoghurt. On the other hand, try to reduce your intake of saturated and trans fats of animal origin. Find more information in the YOUR DIET IN DETAIL section.
- Get regular physical activity. Find more information in the PHYSICAL ACTIVITY section.
- Sleep around 8 hours a day. Find more information in the BIOLOGICAL CLOCK section.
- Avoid tobacco use and exposure to tobacco.
- Check your blood pressure at least once a year. High blood pressure (hypertension) is a significant risk factor for cardiovascular disease and other associated problems.

ANNEX 1: GENETIC RESULTS

GENE	METABOLIC FUNCTION	REFERENCE GENOTYPE	YOUR GENOTYPE
FTO-1	Protein detection	TT	TA
FTO-2	Protein detection	TT	TC
FTO-3	Protein detection	GG, GT	GT
NPY	Satiety and appetite regulation	TT	TT
GHRL	Appetite regulation	CC	CC
MC4R	Fat detection, thermogenesis and satiety regulation	TT	TC
MC4R	Fat transport and regulation of cholesterol levels	CC	CC
TCF7L2	Fat detection and movilization	CC	CT
APOA2	Fat transport, regulation of cholesterol levels and oxidation	AA, GA	GA
APOA5	Fat transport and regulation of cholesterol levels	AA	AA
FABP2	Fat capture and oxidation	CC	CC
PPARA	Adipogenesis, lipolysis and beta-oxidation and carbohydrate metabolism	CC	CC
PPARG	Adipogenesis, lipolysis and beta-oxidation	CC	CC
ADRB2	Lipolysis during exercise in response to catecholamines	AA/CC, GA/CC, GG/CC	GA/CC
ADRB3	Lipolysis during exercise in response to catecholaminess	AA	AA
PLIN1-1	Thermogenesis, lipolysis and beta-oxidation	CC/TT, CC/CT, CT/TT, CT/CT, CT/TT	TT/CC
PLIN1-2	Thermogenesis, lipolysis and beta-oxidation and circadian rhythm	TT, AT	AA
PGC1A	Thermogenesis and beta-oxidation	CC	CC
UCP2	Thermogenesis	TT	CT

Homozygous: 2 alleles without risk
Heterozygous: 1 allele with risk and 1 allele without risk
Homozygous: 2 alleles with risk

ANNEX 1: GENETIC RESULTS

GENE	METABOLIC FUNCTION	REFERENCE GENOTYPE	YOUR GENOTYPE
GNB3	Adipogenesis and carbohydrate metabolism	CC	
ACE	Carbohydrate detection	II	DD
GLUT2	Carbohydrate detection	GG	GG
PLIN1-3	Carbohydrate detection	CC	CC
TAS1R2	Carbohydrate detection	GG/CC, GG/TC, GG/TT, TG/TC, TT/TC, TG/CC, TT/CC	TG/TC
DRD2	Gluttony	GG	GG
CLOCK	Circadian rhythm	AA	AG
CYP1A2-1	Metabolisation of caffeine	AA	CC
CYP1A2-2	Metabolisation of caffeine	GG	AA
CAT	Oxidation	GG	AG
GSTM1	Oxidation	II	ID
GSTT1	Oxidation	II	II
GSTP1	Oxidation	GG	AA
MNSOD	Oxidation	GG, AG	AG
IL6	Inflammation	GG, CG	
TNFA	Inflammation	GG	

Homozygous: 2 alleles without risk
Heterozygous: 1 allele with risk and 1 allele without risk
Homozygous: 2 alleles with risk

TECHNOLOGY

DNA Microarray technology consists of a solid surface with microscopic reactions (microreactions) or DNA chip, on which molecular probes are attached to detect the presence of target DNA molecules. Probe-target hybridization is usually detected and quantified by measuring the intensity of a given fluorescence provided by the molecular probe in samples. This type of technology allows the detection of thousands of specific DNA fragments present in a DNA sample. On the other hand, the specificity in terms of DNA sequence recognition is very high since single nucleotide exchange (single-base resolution) can be detected using short oligonucleotide probes (20-25 nucleotides). As a result, DNA Microarray technology has also evolved to be applied as a DNA sequencing technique to genotype several hundred thousand single nucleotide variants (SNVs) in target genes located throughout the genome (Whole Genome DNA Microarray).

Bead Chip Infinium Global Screening Array Orion (GSA Orion) is a line of DNA chips developed by Illumina for its DNA Microarray iScan platform, widely used in population genetic studies and precision medicine, providing optimized content with 100 % reliable and reproducible high-quality genotyping results. The construction of the GSA Chip was carried out in collaboration with a consortium of experts, and for the selection of SNVs, information from prestigious scientific databases such as gnomAD, NHGRI-EBI-GWAS Catalog, ClinVAr, MHC-HLA-KIR and PharmGKB has been used. The GSA allows the analysis of approximately 700,000 SNVs that cover variants of interest (hot spots) throughout the entire genome, impacting a wide range of genetic traits with physiological and pathophysiological implications. In addition, it allows the customization by users to incorporate Ad Hoc 50,000-100,000 variants of interest.

RISKS AND LIMITATIONS

The recommendations described throughout this report are for guidance only and DATSME cannot be held responsible for any misinterpretation of the data provided. DATSME cannot be held responsible for any misinterpretation of the data provided. If you suffer from any type of consult your doctor, especially in case of pregnancy, breastfeeding, allergy, diabetes or any other medical condition, allergy, diabetes or taking medication to adjust the doses of food supplements or other recommendations. supplements or other recommendations.
The test only detects the specified genetic variants.
NutritionMe is not a medical report. DATSME is not responsible for any misinterpretation of the results.

GLOSSARY

- **Allele:** Each of the alternative forms of a gene, which may have differences in their sequence.
- **Amino acids:** Organic compounds that combine to form proteins.
- **ATP:** Acronym of adenosine triphosphate. Primary molecule in obtaining energy for many essential processes, such as muscle contraction.
- **Beta-Oxidation:** It is a metabolic process, in which fatty acids are broken down to produce energy in the form of ATP.
- **Catecholamines:** A type of neurohormone (a chemical substance produced by nerve cells and used to send signals to other cells). Catecholamines are important in responding to stress. Dopamine, epinephrine (adrenaline), and norepinephrine (noradrenaline) are examples of catecholamines.
- **Cell:** Basic structural and functional unit of life.
- **DNA:** Abbreviation for deoxyribonucleic acid. A molecule present in our cells that contains the genetic information necessary for the development and proper functioning of living organisms.
- **Free radicals:** A free radical is a molecule that is produced every day in our body due to the biological reactions that occur in cells. These radicals are necessary to maintain good health, but an imbalance in their levels can cause cell damage, and consequently, various diseases.
- **Gene:** A segment of DNA that represents the unit of hereditary information.
- **Genetic predisposition:** Also called genetic susceptibility. It is the increase in the probability of developing a certain condition or pathology due to the presence of one or more genetic variations.
- **Genotype:** Combination of the variants of a gene in an individual.
- **Glucose:** It is a simple sugar (monosaccharide) that is an essential source of energy in many metabolic processes for the body to function properly.
- **Ghrelin:** A gastric hormone that regulates the sensation of appetite, also known as the hunger hormone.
- **Glucagon:** A hormone produced in the pancreas that increases blood glucose levels, counteracting the effects of insulin.
- **Haplotype:** A set of DNA variations, or polymorphisms, that tend to be inherited together.
- **Heterozygous:** When the two alleles of the same gene are different.
- **Homozygous:** When the two alleles of the same gene are identical.
- **Lipolysis:** It is a metabolic process through which the body's lipids (fats) are transformed to produce fatty acids and glycerol.
- **Metabolism:** Set of chemical processes that occur within a cell or organism and serve to produce energy or use it as fuel.

- **Mutation:** Variation in the nucleotide sequence of genes that affects 1% of the population.
- **Oxidative stress:** Produced by an imbalance of the metabolism that produces many free radicals but cannot eliminate the excess. This results in cellular deterioration.
- **Phenotype:** Set of directly visible characters of an organism.
- **Polymorphism:** Variation in the nucleotide sequence of genes that affects ≥1% of the population.
- **SNP:** Single nucleotide gene polymorphism.
- **Thermogenesis:** It is a metabolic process that mainly uses the lipids and sugars of brown adipose tissue to generate heat.

Genetics for people

Contact:

Scientific Park
Valencia University

St, Agustín Escardino Benlloch, 9
Paterna, Valencia

(+34)96 321 77 58
info@overgenes.com

www.overgenes.com