Personalised Methylation Report

Made For (Client's name)

Dear (Client's name)

Welcome to your Methylation report!

You've taken a great step on your personalised wellness journey by exploring the science of methylation.

Understanding your body's unique needs is key to long-term wellness. Methylation, a critical biochemical process influenced by your genetics, plays a pivotal role in numerous bodily functions.

Your Methylation report will reveal how your unique genetic makeup affects your methylation capabilities, guiding you in optimising your nutrient intake for enhanced methylation activation.
This personalised insight empowers you to tailor your lifestyle and nutrition choices to boost your overall health and wellbeing.

Within your report, you'll discover the importance of key nutrients in methylation, how your DNA impacts your needs, and actionable steps to optimise your methylation pathways.

Read on to find out more about you.

What is Methylation?

Methylation refers to the process where methyl groups are transferred between molecules, altering their structure and function.

A methyl group is made up of one carbon atom and three hydrogen atoms, hence the alternative term "one carbon metabolism". Methylation can be thought of as the process of turning a raw material into a form that we can use, and is involved in almost every biochemical reaction in every cell in our body, occurring billions of times per second. Understanding methylation and its impact on health is crucial for managing and optimising these vital biochemical processes. Genetic variations in key genes involved in the methylation cycles can significantly influence individual health outcomes, necessitating personalised approaches to nutrition and supplementation.

Methylation is essential for a multitude of processes within our body, without which we simply wouldn't function. The regulation of gene expression, energy production, fat metabolism, protein function, immune responses and cell membrane repair all rely on methylation. Additionally, methylation plays a key role in the production and metabolism of neurotransmitters that regulate mood (and other neural processes) and so has a huge impact on our mental function. It also aids in detoxification processes that neutralise toxins, thereby promoting overall health.

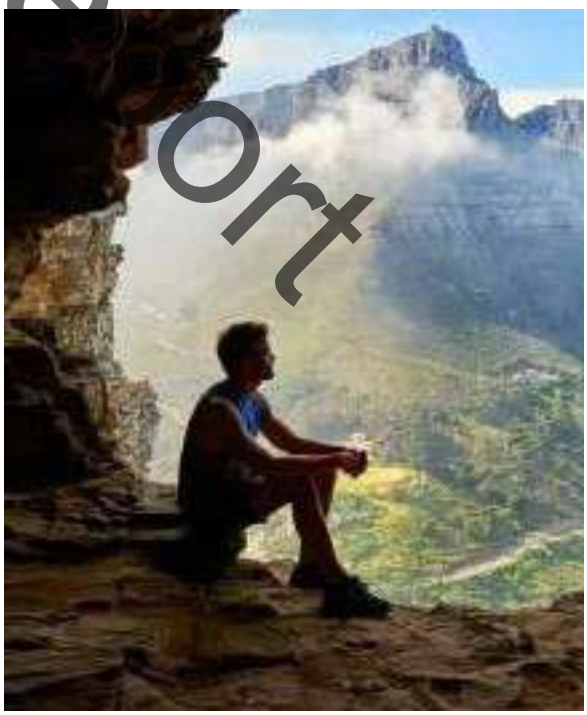
What other factors influence Methylation capabilities?

Several factors can influence methylation, including diet, toxin exposure, and stress. Deficiencies in key dietary cofactors involved in the methylation cycles such as vitamins, minerals, and amino acids can impair the methylation process. In turn this can increase susceptibility to chronic conditions such as impaired immunity, fatigue, cardiovascular disease, neurological disorders, multiple cancers, and mood and psychiatric disorders.

Methylation and your DNA

We all carry genes that are involved at various stages within the methylation pathways, and variants in these genes can significantly influence their function. By assessing these genetic variants, or single nucleotide polymorphisms (SNPs), we can understand their potential impact on how that gene functions and identify any inhibited methylation pathways.

In turn, this can help us identify an individual's specific nutritional support needs or lifestyle interventions which could reduce potential risks and contribute to better overall health. Although you can't change your genetic code, the expression, synthesis, and function of your genes can be modulated and supported once we are armed with the right knowledge!



Helpful Terms

You'll see some of the same terms come up many times throughout your report. Here are some definitions you can refer back to:

Methylation

A biochemical process involving the transfer of methyl groups between molecules, crucial for regulating gene expression, protein function, and detoxification. Methylation occurs billions of times per second in every cell. Impaired methylation can lead to health issues such as cardiovascular disease, neurological disorders, and impaired detoxification, while overactive methylation can cause abnormal gene expression and potentially cancer.

One Carbon Metabolism

A network of biochemical pathways that involve the transfer of one-carbon units (methyl groups) between molecules. This process is essential for DNA synthesis and repair, amino acid metabolism, and the regulation of gene expression.Methyl GroupA chemical group consisting of one carbon atom bonded to three hydrogen atoms (CH3). Methyl groups are transferred between molecules in methylation reactions, influencing gene expression, protein function, and metabolism. Imbalances can disrupt numerous biological processes.

Homocysteine

A sulphur-containing amino acid that is an intermediate product in the metabolism of methionine and cysteine. Elevated levels of homocysteine, known as hyperhomocysteinaemia, can increase the risk of cardiovascular diseases, cognitive decline, and other health issues. Low levels are uncommon and usually not problematic, but they may indicate a deficiency in related nutrients such as folate or vitamin B12.

Methionine

An essential amino acid obtained from dietary protein that plays a key role in methylation. Methionine is converted to S-adenosylmethionine (SAMe), the body's primary methyl donor. Deficiency can impair methylation and detoxification processes, while excess methionine intake can lead to elevated homocysteine levels, increasing the risk of cardiovascular diseases.

SAMe (S-adenosylmethionine)

A compound derived from methionine and ATP that serves as the primary methyl donor in numerous biochemical reactions, including DNA methylation, neurotransmitter synthesis, and detoxification. Low levels can impair these processes, while high levels may indicate excess methionine intake or dysregulated methylation.

SAH (S-adenosylhomocysteine)

A byproduct of methylation reactions where SAMe donates a methyl group. SAH is subsequently hydrolysed to homocysteine and adenosine, and high levels of SAH can inhibit methylation. Elevated SAH can indicate impaired methylation and contribute to elevated homocysteine levels.

SAMe:SAH Ratio

The SAMe:SAH ratio is commonly used as an indicator of cellular methylation potential. A higher ratio suggests a favorable environment for methylation reactions, implying that there are sufficient methyl groups available. Conversely, a lower ratio may indicate a reduced capacity for methylation, possibly due to lower levels of SAM or higher levels of SAH.

Cofactors

Non-protein chemical compounds that bind to enzymes and are necessary for their activity. Cofactors can be metal ions (such as magnesium or molybdenum) or organic molecules (such as vitamins). Deficiency in cofactors can impair enzyme function, while excessive intake can sometimes disrupt metabolic balance.

Neurotransmitters

Chemical messengers that transmit signals across synapses between neurons and other cells. Key neurotransmitters include serotonin, dopamine, norepinephrine, and acetylcholine, which play vital roles in mood regulation, cognition, and bodily functions. Imbalances can lead to mental health issues, while normal levels are crucial for healthy brain function.

Neurotransmitter Metabolism

The processes involved in the synthesis, release, reuptake, and breakdown of neurotransmitters. Proper metabolism is essential for maintaining neurotransmitter balance and function, which affects mood, cognition, and overall neurological health. Disruptions can lead to neurological and psychiatric disorders.

Oxidative Stress

A state where there is an imbalance between the production of free radicals (like superoxide radicals) and the body's ability to detoxify them with antioxidants. This imbalance can lead to cellular damage, inflammation, and contribute to various diseases, including cardiovascular and neurodegenerative disorders. Managing oxidative stress is essential for maintaining overall health.

Free Radicals

Highly reactive molecules with unpaired electrons that can cause cellular damage through oxidative stress. Free radicals are produced during normal metabolic processes and in response to environmental factors. Excessive free radicals can lead to chronic diseases, while very low levels may affect normal cellular signalling.

Superoxide Radicals

A type of free radical formed when oxygen gains an extra electron. Superoxide radicals are highly reactive and can damage cellular components, contributing to oxidative stress and inflammation. High levels are harmful, while very low levels might impair certain cell signalling pathways.

Atheroprotective

Refers to substances or actions that protect against the development of atherosclerosis, the buildup of fatty plaques in the arteries that can lead to cardiovascular disease. Lack of atheroprotective factors can increase cardiovascular risk, while enhancing these factors can improve heart health.

Vasodilation

The widening of blood vessels, which decreases blood pressure and improves blood flow. This process is mediated by various factors, including nitric oxide, and is important for maintaining cardiovascular health. Impaired vasodilatation can lead to hypertension and cardiovascular disease, while excessive vasodilatation can cause dangerously low blood pressure.

Vitamin B9

An essential B vitamin encompassing both folate and folic acid, crucial for numerous metabolic processes including DNA synthesis and repair, and methylation.FolateThe natural form of vitamin B9 found in food sources such as leafy greens, legumes, and fruits. It is involved in DNA synthesis and repair, and the conversion of homocysteine to methionine. Deficiency can lead to anaemia and neural tube defects, while excess intake from supplements may mask vitamin B12 deficiency.

Folic Acid

The synthetic form of vitamin B9, commonly found in supplements and fortified foods. It needs to be converted to its active forms (methylfolate) in the body. High intake of folic acid can potentially mask a vitamin B12 deficiency, and lead to a variety of possible health risks.

Cobalamin

Another name for vitamin B12, an essential vitamin that plays a crucial role in the methylation of homocysteine to methionine, red blood cell formation, and neurological function. Deficiency can cause anaemia and neurological disorders, while high intake is generally considered safe as excess is excreted.

Molybdenum

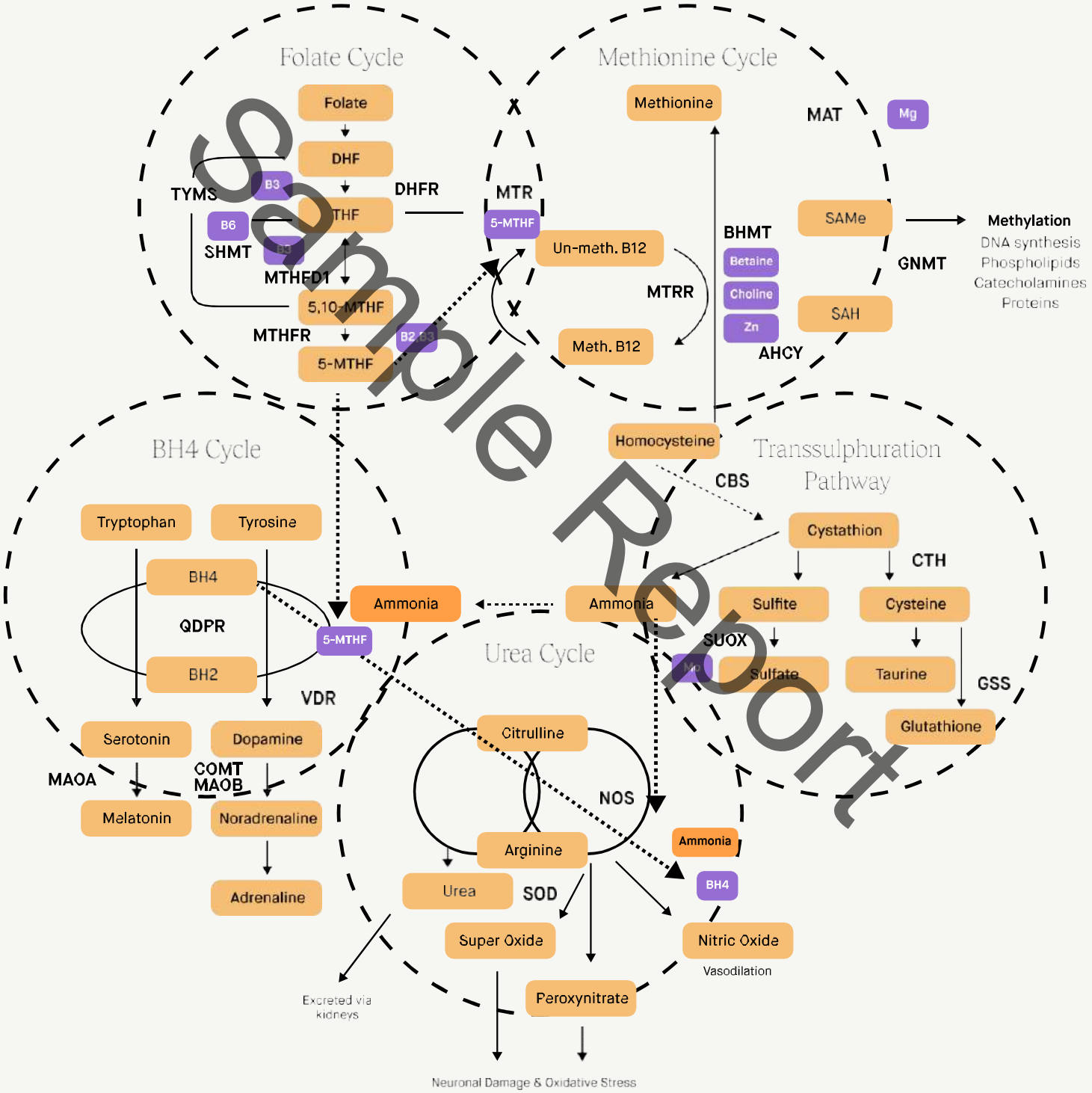
Highly reactive molecules with unpaired electrons that can cause cellular damage through oxidative stress. Free radicals are produced during normal metabolic processes and in response to environmental factors. Excessive free radicals can lead to chronic diseases, while very low levels may affect normal cellular signalling.

Superoxide Radicals

A trace mineral that acts as a cofactor for several enzymes, including those involved in the detoxification of sulphite and the metabolism of certain amino acids. Deficiency is rare but can lead to metabolic disturbances, while excessive intake may cause toxicity.

The Methylation Cycles

When assessing your genetic variants related to methylation, we will look at them in relation to 5 key metabolic pathways, or "cycles", that occur within your body every day.



The Folate Cycle

The Folate Cycle

Your Folate Cycle results show a Moderate Efficiency

NORMAL | MODERATE | IMPAIRED

Gestational/Pregnancy health | DNA synthesis and repair | Energy production | Inflammation control

Detailed Summary

The Folate Cycle is the first stop for dietary folic acid/folate that enters our bodies. It is here that we convert folate into usable forms for numerous important processes occurring elsewhere in the body, including the other pathways detailed later in this report.

Folate, also known as vitamin B9, enters the body in two different forms: either as naturally occurring folate from dietary sources, or as the synthetic form known as folic acid, which is found in supplements and fortified foods. Folate is then transported into our cells where folate is first converted to dihydrofolate (DHF) and then into tetrahydrofolate (THF), with the support of vitamin B3.

The Folate Cycle is in fact two linked cycles: in a process which catalyses three sequential reactions in the interconversion of THF metabolites, utilising vitamins B3 and B6. These metabolites are crucial for synthesising purine, thymidine (nucleotides), and methionine. The reactions are reversible and once THF is converted into 5,10-methylene THF it is then used in one of 2 ways:
i) supporting the methylation process during the formation of DNA that is required for proper cell division, or
ii) converted to methylfolate (5-MTHF), the "active" form of folate.

Methylfolate is an important product of the folate cycle: firstly, it provides a methyl group (CH_3) to The Methionine Cycle when converted back to THF in a process involving vitamin B12 and Zinc; secondly, it is used to drive the conversion of BH_2 to BH_4 to support The BH4 Cycle which is an important component of neurotransmitter metabolism.

Considerations

Alongside your folate cycle result, it may be important to test serum and erythrocyte (red blood cell) folate levels. As serum folate levels are sensitive to recent dietary or supplementary intake, red blood cells (RBC) levels may be more indicative of tissue folate stores. Ensure adequate intakes of all B vitamins - particularly vitamins B9 (folate) B2, B3 and B6. Methylated or other forms of B vitamins (e.g. 5-MTHF) may be appropriate depending on SNPs and environmental factors.

Key Genes

DHFR - This gene is involved in the assimilation of folate from all sources, as well as the conversion of DHF to THF - a methyl group transporter necessary for the synthesis of purines, thymidine and nucleic acids and ultimately methylfolate for use in The Methionine Cycle. The deletion variant of this gene impacts folic acid metabolism, which can reduce the availability of 5-MTHF. In DD genotypes, high intakes of folic acid (>500mcg) are linked to higher circulating levels of unmetabolised folic acid, and low intakes (<250mcg) are associated with low red blood cell folate levels. Antifolate drugs work by blocking DHFR, therefore reducing THF levels and suppress purine/pyrimidine synthesis.

MTHFD1 - This gene codes for an enzyme that catalyses conversion of THF to 5,10-Methylene THF via 3 distinct, sequential and reversible

reactions. The intermediate metabolites are required for the synthesis of purine (for DNA synthesis & repair), thymidine (for nucleotide biosynthesis) and methionine (via The Methionine Cycle), and so variations in this gene can impact all these processes.

MTHFR - A key regulatory enzyme responsible for converting folate to its "active" form: 5-MTHF (methylfolate). 5-MTHF is needed for the re-methylation of homocysteine to methionine (i.e. The Methionine Cycle), as well as the metabolism of neurotransmitters, phospholipids and proteins (via the BH4 cycle).
Variants in C977T can cause lower activity: 40% reduction for heterozygotes (CT), and 70% for homozygotes (TT). The A1298C variant does not impact 5-MTHF levels as much, but is associated with BH4 depletion, which can impact neurotransmitter synthesis and The Urea Cycle function.

MTR - transfers methyl group from methylfolate (5-MTHF) to B12. The folate is then recycled back to THF. Methylated vitamin B12 is then used in converting homocysteine in The Methionine Cycle. Variants upregulate activity, therefore lower homocysteine levels, but higher activity could also pull folate to The Methionine Cycle at the expense of other needs (e.g. purine/nucleotide synthesis).

Your Genetic Results

The below table shows the genes analysed in relation to your Folate Cycle Efficiency. For each gene you will see its name, location (RSID), your genotype, effect, and further information on your variants.

Gene	Location	Genotype	Effect
DHFR	rs70991108	Not Found	-
MTHFD1	rs2236225	Not Found	-
MTHFR (A1298C)	rs1801131	AA	-
This genotype is not associated with reduced MTHFR enzyme activity. You do not carry the genetic mutation that can impact BH4 levels.			
MTHFR (C677T)	rs1801133	CT	●
This variant is associated with a 40% reduction in MTHFR enzyme activity. About 30% of the population possess at least one T allele, and it is associated with an increased risk of high homocysteine & low folate levels.			
MTR	rs1805087	AA	●●
You do not carry an "upregulating" allele for this gene, meaning lower MTR function and potentially higher homocysteine levels than carriers of the G allele.			

Specific Gene Advice

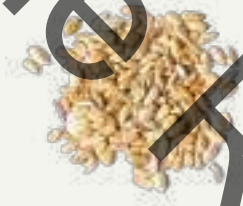
Based on specific gene results we also have the following recommendations:

Gene	Recommendation
MTHFR (C677T)	You can support your MTHFR gene activity by increasing your intake of vitamin B-rich foods such as dark leafy greens. If supplementing, choose methylated folate (e.g. 5-MTHF), as well as vitamins B2 (riboflavin) and B3 (niacin). Monitoring levels of these vitamins as well as homocysteine, SAM and SAH is advisable.
MTR	It is important to consider your MTR result in conjunction with MTHFR to assess overall impact. As your genetic result is associated with elevated homocysteine levels, consider monitoring this as well as folate and vitamin B12 levels.

Advice for You

Here's some recommended lifestyle tips and practices based on your result:

With these genetic results it is important to consider your intake of all B vitamins - paying particular attention to B9 (folate) B2, B3 and B6. Look for methylated forms (e.g. 5-MTHF for folate) as these are the "active forms" and will be more readily utilised.



Blood testing is a great way to monitor potential risks associated with methylation - homocysteine levels, SAMe:SAH ratio and B vitamin levels are useful markers to track.

If taking a blood test, pay attention to folate levels. Serum folate levels can be easily affected by recent intake (dietary or supplementary) and so erythrocyte (red blood cell) folate levels may be a better indicator of tissue status.

The Methionine cycle

Methionine Cycle

Your Methionine Cycle results show a Moderate Efficiency

NORMAL | MODERATE | IMPAIRED

Gestational health

Amino acid synthesis

Metabolic health

Detailed Summary

The Methionine Cycle involves some of the most well-researched methylation genes. It is often referred to simply as The Methylation Cycle, and one of its key products is SAMe, which functions as a methyl donor across a multitude of important methylation processes in the body. Crucially, The Methionine Cycle is also responsible for recycling homocysteine back to methionine.

This cycle is a vital biochemical process that metabolises methionine, an essential amino acid, through a series of steps to support various cellular functions. In the first step, methionine is converted to S-adenosyl-methionine (SAMe), which uses ATP. SAMe is the main source of methyl groups for most biological methylations and is known as the master methyl donor. Once SAMe donates it's methyl group to become S-adenosyl-homocysteine (SAH), adenosine is removed to become homocysteine. The accumulation of SAH can inhibit methylation, so cells must maintain low SAH levels.

There are two ways that homocysteine can be recycled back into methionine: the 'long route' and the 'short route'. These involve different genes and cofactors as explained below. This reaction is also required for the irreversible oxidation of choline and significantly contributes to the body's choline supply, supplementing dietary intake.

Homocysteine can also be pulled from The Methionine Cycle into The Transsulphuration Pathway.

Considerations

When assessing The Methionine Cycle, it is also recommended to test homocysteine, methionine, vitamin B12 and SAMe levels. The ratio of SAH:SAMe is also a useful indicator of SAMe conversion.

Key Genes

MTR - This gene encodes methionine synthase, an enzyme that catalyses the remethylation of homocysteine to methionine via the 'long route', using 5-methyltetrahydrofolate (5-MTHF) from The Folate Cycle as a methyl donor, resulting in the formation of methylated vitamin B12 (methylcobalamin).

MTRR - This gene is responsible for regenerating MTR via a methylation reaction that utilises SAMe as a donor. Additionally, MTRR aids in maintaining MTR activity by recycling and converting vitamin B12 to its methylated form (methylcobalamin).

FUT2 - This gene regulates the expression of H antigens on the gastrointestinal mucosa, determining an individual's secretor status. The absorption of vitamin B12 depends on the secretion of the glycoprotein intrinsic factor (IF) by gastric cells, the binding of IF to vitamin B12, and a functional gastrointestinal absorption system.

TCN2 - This gene encodes transcobalamin II, a protein responsible for binding and transporting vitamin B12 into cells.

PEMT - This gene encodes an enzyme that converts phosphatidylethanolamine to phosphatidylcholine through methylation, thereby providing a source of choline. Oestrogen stimulates the expression of the PEMT gene, enabling premenopausal women to produce more of their necessary choline internally compared to postmenopausal women and men.

BHMT - This gene encodes an enzyme that facilitates the remethylation of homocysteine to methionine through the 'short route', utilising betaine as a methyl donor upon conversion to DMG (dimethylglycine). The BHMT pathway relies on zinc and requires sufficient levels of TMG (trimethylglycine or betaine) for optimal functioning. This process is essential for the irreversible oxidation of choline. BHMT activity may also be influenced by cortisol levels (stress) and could potentially impact norepinephrine levels, thereby contributing to ADD/ADHD.

Your Genetic Results

The below table shows the genes analysed in relation to your Methionine Cycle Efficiency. For each gene you will see its name, location (RSID), your genotype, effect, and further information on your variants.

Gene	Location	Genotype	Effect
MTR	rs1805087	AA	●●
You do not carry an upregulating allele for this gene, which is associated with lower MTR function and potentially elevated homocysteine levels. This can in turn reduce methionine levels, which can influence cancer risk and tumor growth, as approximately 50% of cancer cell types depend on methionine.			
MTRR	rs1801394	AG	●
You carry one copy of the G allele, which downregulates the activity of the MTRR gene and reduces the ability to re-methylate the vitamin B12 needed for MTR to function in the methionine cycle. This can contribute to high levels of homocysteine.			
BHMT	rs3733890	Not Found	-
PEMT	rs7946	Not Found	-
FUT2	rs601338	AA	-
You carry alleles that are indicators of an inactive FUT2 gene and non secretor status. About 20% of people are non secretors. This result reduces susceptibility to H. pylori infection and gastrisis linked to reduced vitamin B12 absorption.			
TCN2	rs1801198	CC	-
You carry neutral alleles for this gene, meaning normal TCN2 function with no impact on ability to absorb and transport cobalamin (vitamin B12).			

Specific Gene Advice

Based on specific gene results we also have the following recommendations:

Gene	Recommendation
MTR	Take into account both your MTR and MTRR results to evaluate the overall effect on your vitamin B12 levels. Since your genetic results are linked to elevated homocysteine levels, consider monitoring this. You can support MTR activity by supplementing with the methylated form of vitamin B12 (e.g. methylcobalamin).
MTRR (A66G)	Hydroxycobalamin (the injectable form of vitamin B12) may be the preferred form for this result. Additionally, maintain sufficient antioxidant intake with foods like berries, kale, and various herbs and spices to reduce oxidative stress. Support methylation with B2 from foods such as eggs, almonds, and spinach, and B3 from foods like chicken, peanuts, and brown rice. Both smoking and secondary exposure to tobacco smoke should be avoided, as smoking is known to increase homocysteine levels.

Advice for You

Here's some recommended lifestyle tips and practices based on your result:

With these genetic results it is important to consider your intake of folate (green leafy veg), vitamin B12, betaine (beetroot) and choline (eggs). SAMe supplementation may be considered.

Functional testing of homocysteine, methionine, vitamin B12 and SAMe levels may be considered. The ratio of SAH: SAMe is also a useful indicator of SAMe conversion.

Prioritising your gastrointestinal health by integrating probiotics into your diet—whether through foods like yogurt, kefir, kimchi or sauerkraut or via supplementation—and increasing fiber intake from sources like legumes, grains, fruits, and vegetables is advantageous.

The Transsulphuration Pathway

Transulphuration Pathway

Your Transsulphuration Pathway results show a Normal Efficiency

NORMAL | MODERATE | IMPAIRED

Oxidative stress reduction · Vascular/circulatory functioning · Neuroprotective roles · Telomere protection

Detailed Summary

The Transsulphuration Pathway is a metabolic process that offers an alternative pathway for the conversion of homocysteine where it is converted to cysteine via the intermediate cystathionine. Cysteine is a precursor of glutathione (a major antioxidant), and taurine (an essential amino acid). Cystathionine is also a central component of sulphur metabolism. This involves the oxidation of sulphite, which is produced from cystathionine, to sulphate and is catalysed by a molybdenum-dependent enzyme, helping to detoxify sulphites in the body. Sulphites can increase cortisol and cause brain fog while sulphate is less toxic and can be excreted in the urine.

Once homocysteine is converted to cystathionine, it is then converted into cysteine which requires vitamin B6 as a co-factor. This conversion process generates ammonia (which in large amounts can deplete BH4 - see The BH4 Cycle) as a by-product. Glutathione synthesis in the liver is dependent upon the availability of cysteine and is important for healthy detoxification as well as protecting cells from oxidative damage by free radicals, detoxifying xenobiotics, and facilitating membrane transport. Cysteine can also be further converted into taurine through a series of enzymatic reactions. Taurine is an important amino acid that plays various roles in bile salt formation, cellular osmoregulation, and neurotransmission. The pathway also involves the creation of succinyl-CoA, a reaction that depends on adenosylcobalamin (vitamin B12) as a cofactor. Succinyl-CoA is a critical intermediate in The Krebs Cycle and is crucial for the synthesis of ATP, heme, cytochrome P450s, and nucleotides.

Considerations

When evaluating the effectiveness of The Transsulphuration Pathway, conducting plasma amino acid profile can provide valuable insights. With these tests it's possibly to assess homocysteine, taurine, glutathione, ammonia, and sulphur-containing amino acids like cysteine and methionine. Additionally, a urine dipstick test can be used specifically for detecting sulfur.

Key Genes

CBS - This gene encodes an enzyme that catalyses the initial step of The Transsulphuration Pathway, converting homocysteine, derived from methionine in The Methionine Cycle, to cystathionine with vitamin B6 and heme as cofactors.

GSS - This gene encodes an enzyme that governs the second phase of glutathione synthesis, facilitating the transformation of cysteine into glutathione with the aid of ATP.

Your Genetic Results

The below table shows the genes analysed in relation to your Transsulphuration Pathway Efficiency. For each gene you will see its name, location (RSID), your genotype, effect, and further information on your variants.

Gene	Location	Genotype	Effect
CBS	rs234706	AG	●
This genotype slightly upregulates CBS gene activity and can "pull" more homocysteine from The Methionine Cycle into The Transsulphuration Pathway. Therefore, this result is associated with lower homocysteine levels and can counteract inhibited MTHFR activity. However, this can reduce SAMe synthesis, deplete vitamins B6 & B12, and may also lead to low glutathione production.			
GSS	rs6088659	Not Found	-

Specific Gene Advice

Based on specific gene results we also have the following recommendations:

Gene	Recommendation
CBS (C699T)	Increasing your intake of cofactors such as zinc (e.g. from lentils), betaine (wholegrains), and choline (chicken, broccoli) will promote the homocysteine recycling via the BHMT 'shortcut' pathway. Reduce ammonia levels by limiting animal protein intake, enhancing gut health, or consider using activated charcoal. Ensure adequate intake of vitamins B6 and B12.

Advice for You

Here's some recommended lifestyle tips and practices based on your result:

Although genetically your Transsulphuration Pathway is working efficiently, it is still important to ensure sufficient intake of vitamins B2, B6, B12, choline, zinc, and betaine.

Animal proteins and by-products such as beef, chicken, fish, eggs, and milk are excellent sources of vitamins B2, B6, B12, choline, and zinc, although excessive intake can elevate ammonia levels. Betaine can be found in beetroot, green leafy vegetables, and wholegrains like quinoa.

Urine and plasma amino acid profile testing is a great way to monitor potential risks associated with homocysteine metabolism. It may be beneficial to check levels of homocysteine, taurine, glutathione, ammonia, and sulfur-containing amino acids such as cysteine and methionine.

Neurotransmitter Metabolism

BH4 Cycle

Your BH4 Cycle results show a Moderate Efficiency

NORMAL | MODERATE | IMPAIRED

Neurotransmitter metabolism · Thyroid health · Inflammation · Oxidative stress

Detailed Summary

The BH4 Cycle is essential for various processes in the body, including neurotransmitter metabolism, specifically in the production of key neurotransmitters such as dopamine, serotonin, melatonin, norepinephrine, and thyroid hormones.

In this cycle, BH4 or Tetrahydrobiopterin is regenerated from dihydrobiopterin (BH2). An enzyme catalyses the regeneration of BH4 from BH2, a reaction requiring active folate (5-MTHF) from The Folate Cycle. Phenylalanine is converted to tyrosine with the help of BH4. Tyrosine is then converted into a precursor of dopamine and subsequently into dopamine itself, with BH4 acting as a crucial cofactor in this process. Similarly to tyrosine, tryptophan is converted into a serotonin precursor, and then into serotonin, again requiring BH4. Serotonin is then oxidised into melatonin, a process that requires SAMe from The Methionine Cycle and vitamin B2 as cofactors. Norepinephrine from dopamine is converted to epinephrine in the adrenal medulla, also requiring SAMe as a methyl donor. BH4 also plays a role in The Urea Cycle and is vital for neutralising ammonia and generating nitric oxide. Low levels of 5-MTHF and SAMe can negatively influence neurotransmitter levels and low (or indeed high) neurotransmitter levels can result in mood imbalances, poor memory, concentration issues, sleep disturbances, and aggressive behaviour.

Considerations

When investigating the efficiency of The BH4 Cycle, testing your neurotransmitter balance and SAH:SAMe ratio could be beneficial. Assessing the amino acids tryptophan and tyrosine, vitamins B2, B6 and D, and methylfolate levels is also helpful. Environmental factors can also have a strong effect: stress both physical and mental, and diet (e.g., stimulants or toxicity of heavy metals).

Key Genes

VDR - This gene encodes the nuclear hormone receptor for vitamin D3 (the active form of vitamin D in the body). This catalyses the conversion of tyrosine into dopamine.

COMT - This gene plays a role in the metabolism of dopamine, noradrenaline, and adrenaline. These neurotransmitters play significant roles in regulating mood, cognition, and the body's response to stress.

MAOA - This enzyme catalyses the breakdown of monoaminergic neurotransmitters serotonin, melatonin, noradrenaline, and adrenaline. MAOA is found on the X chromosome, hence males possess only one allele inherited from their mother. We, therefore, present results for males as homozygous, as they do not inherit a 'balancing' allele.

MAOB - The primary enzyme responsible for breaking down phenethylamine (PEA), benzylamine, histamine, dopamine, tyramine, and tryptamine. Just like MAOA, MAOB is found on the X chromosome, hence males possess only one allele inherited from their mother. We, therefore, present results for males as homozygous, as they do not inherit a 'balancing' allele.

MTHFR - A key regulatory enzyme responsible for converting folate to its "active" form: 5-MTHF (methylfolate). The particular SNP looked at here (A1298C) regulates the conversion of MTHF to BH4 which is vital in the metabolism of neurotransmitters, phospholipids and proteins.

Your Genetic Results

The below table shows the genes analysed in relation to your BH4 Cycle Efficiency. For each gene you will see its name, location (RSID), your genotype, effect, and further information on your variants.

Gene	Location	Genotype	Effect
MTHFR (A1298C)	rs1801131	AA	-
This allele result is associated with normal BH4 levels needed for neurotransmitter synthesis. Methylfolate is pulled from the methionine cycle more readily, so ensure folate levels are adequate to support this and avoid negatively impacting homocysteine recycling.			
COMT	rs4633	CT	●
This genotype is associated with reduced COMT activity, leading to higher dopamine and norepinephrine levels. This can counteract the effects of low VDR activity and result in normal levels. However, with raised VDR activity, the resulting high dopamine levels can increase susceptibility to mood disturbances like anxiety, panic attacks, anger and bipolar disorder. Reduced COMT activity may also raise the risk of endometrial cancer due to its role in oestrogen metabolism, especially with prolonged oestrogen exposure, low folate, and high homocysteine. Low SAMe and high SAH levels can further decrease COMT activity.			
VDR	rs731236	TT	-
Your genotype is associated with normal VDR expression, and therefore no increased risk of vitamin D deficiency. However, low vitamin D levels and stress (cortisol) can reduce enzyme activity, irrespective of genotype. Carriers of variants associated with lower COMT activity may be susceptible to mood swings and intolerance of methyl donors due to high dopamine production and slow breakdown.			
MAOA	rs6323	Not Found	-
MAOB	rs1799836	Not Found	-

Specific Gene Advice

Based on specific gene results we also have the following recommendations:

Gene	Recommendation
MTHFR (A1298C)	You do not carry variants for this particular SNP, and so methylfolate is pulled into the BH4 cycle at a normal rate.
COMT (H62H)	Although your gene activity is only moderately reduced, it's still benefical for you to support SAMe synthesis by consuming adequate amounts of B vitamins (wholegrains and eggs), zinc (beef, chickpeas, and sunflower seeds), potassium (avocados, oranges, and spinach), and magnesium (dark chocolate, quinoa, and cashews). Additionally, incorporate antioxidant-rich foods such as citrus fruits, tomatoes, and spices like cinnamon and cloves to help reduce oxidative stress. Monitor your estrogen levels.
VDR (TaqI)	To ensure adequate vitamin D intake, incorporate foods like salmon, mackerel, egg yolks, dairy products, and fortified mushrooms into your diet. Managing stress can be beneficial as cortisol has a negative effect on enzyme activity.

Advice for You

Here's some recommended lifestyle tips and practices based on your result:

With these genetic results it is important to consider your intake of the B group vitamins and important cofactors such as vitamins D and C. SAMe levels are also important, if found to be low then supplementation may also be considered, as it is not possible to increase through dietary changes.

Doing a urine test to check neurotransmitter balances as well as a plasma SAH:SAMe ratio test may be considered.

Focus on eliminating heavy metals from your system, particularly mercury, lead, and aluminum. These toxic metals can accumulate in the body and disrupt biological processes. Mercury is found in fish like tuna, swordfish, and king mackerel. Lead exposure can come from old paints, contaminated water, and certain pottery and aluminum is often present in food additives, some cosmetics, and cookware.

Urea Cycle

Urea Cycle

Your Urea Cycle results show a Moderate Efficiency

NORMAL | MODERATE | IMPAIRED

Detoxification Cardiovascular function Muscle function

Detailed Summary

The Urea cycle, or ornithine cycle, is a series of biochemical reactions that convert toxic ammonia into urea, which the kidneys can then excrete. This essential process occurs in the liver with the help of enzymes located in both the mitochondria and the cytosol of the cell.

First, ammonia (from The Transsulphuration Pathway) is converted into a compound that combines with ornithine to produce citrulline. Citrulline then moves from the mitochondria to the cytosol, where it combines with aspartate to form arginosuccinate. Arginosuccinate breaks down into arginine and fumarate. Fumarate enters another cycle to become aspartate again while arginine is broken down into urea and ornithine. Ornithine returns to the mitochondria to restart the cycle. Urea is the only new product, while all other molecules are recycled.

Nitric oxide (NO) is a crucial mediator that protects against atherosclerosis and helps regulate vasodilation. It is produced from arginine with the co-factor tetrahydrobiopterin (BH4) from The BH4 Cycle. Adequate levels of BH4 are essential for the proper functioning of nitric oxide synthase (NOS). Without sufficient BH4, NOS produces harmful free radicals such as peroxynitrite and superoxide instead of nitric oxide, leading to compromised cardiovascular function and increased risk of vascular diseases.

Considerations

When investigating the efficiency of The Urea Cycle doing a Blood Urea Nitrogen (BUN) Test to test kidneys efficiency at excreting urea, as well as a blood test to test ammonia levels could be beneficial.

Key Genes

NOS3 - The gene encodes endothelial NOS (eNOS), one of three enzymes responsible for converting L-arginine and molecular oxygen into nitric oxide (NO), utilising BH4 as a cofactor. eNOS mainly makes nitric oxide (NO) in the lining of blood vessels. It is important because it helps widen blood vessels, which regulates blood flow and pressure. It also affects other processes like cell growth, the stickiness of white blood cells to blood vessel walls, and the clumping together of platelets in blood clotting. This function is vital for cardiovascular health, aiding in blood pressure regulation and the transportation of oxygen and nutrients throughout the body.

SOD2 - SOD (superoxide dismutase) enzymes form a group that catalyses the conversion of superoxide into oxygen and hydrogen peroxide, safeguarding cells against the damaging effects of superoxide.

Your Genetic Results

The below table shows the genes analysed in relation to your Urea Cycle Efficiency. For each gene you will see its name, location (RSID), your genotype, effect, and further information on your variants.

Gene	Location	Genotype	Effect
NOS3	rs1799983	GT	●

You carry one copy of the T allele, which associated with low NOS3 enzymatic activity, impaired ammonia breakdown and reduced nitric oxide production. This effect can be compounded by low BH4 levels and excess ammonia.

SOD2	rs4880	CT	●

You carry one copy of T allele, which is linked to reduced superoxide dismutase activity. This diminished ability to breakdown the free radical superoxide may increase your susceptibility to oxidative stress.

Specific Gene Advice

Based on specific gene results we also have the following recommendations:

Gene	Recommendation
NOS3	Ensure adequate intake of folate (B9) from foods such as leafy greens, beans, citrus, and liver; riboflavin (B2) from sources like milk, eggs, and liver; and niacin (B3) from foods such as chicken, liver, and tuna. These nutrients support the production of 5-MTHF and help maintain sufficient levels of BH4. Antioxidants (including vitamin C) are especially important to reduce damage from oxidative stress.
SOD2	Try including more manganese-rich food sources in your diet such as brown rice, spinach, pineapple and whole wheat bread to support SOD activity, and increase your antioxidant intake by including more colourful fruit and vegetables as well as herbs and spices in your diet to reduce oxidative stress.

Advice for You

Here's some recommended lifestyle tips and practices based on your result:

The production of nitric oxide is dependant on BH4, so it is important to support this process by ensuring adequate BH4 levels. Folate intake is especially important in this regard, so aim for plenty of green leafy vegetables or a folate supplement (e.g. 5-MTHF).

With a slightly higher risk of damage from oxidative stress and free radicals, it is important to ensure you are consuming enough antioxidants, including vitamin C, and manganese. You can get antioxidants from foods like berries, citrus fruits, spinach, and nuts, and vitamin C from oranges, strawberries, and bell peppers. Manganese can be found in foods like wholegrains, nuts, and leafy green vegetables.

Consider getting a Blood Urea Nitrogen (BUN) Test to check your kidneys' efficiency in excreting urea, and a blood test for ammonia levels. High ammonia can inhibit nitric oxide production, leading to issues with blood vessel dilation and inflammation, increasing heart risks in people with autoimmune diseases. In chronic kidney disease, high ammonia can worsen vasodilation, raise blood pressure, and accelerate atherosclerosis, especially in diabetic patients.

Precision skin report

Made for (Client’s name)

Hey (Client's name)

Welcome to your skin report!

You've embarked on your personalised skin journey and will soon be equipped with the knowledge to curate your approach to skin wellness.

Your skin report unveils the impact of your unique genetic makeup on your body's response to inflammation, its ability to manage oxidative stress as well as the sufficiency to produce proteins like collagen and elastin both involved in tissue firmness and aging.

Explore your report to understand the role diet plays in skin health, how your DNA shapes your skin's resilience and responses, and discover steps to optimize your skincare to preserve aging.

Keep reading to delve into your personalised insights.

Helpful terms

You'll see some of the same terms come many times throughout your report. Here are some definitions you can refer back to:

What's a oftene?

A gene is a section of your DNA that contains instructions for building a specific protein. This report will focus on genes affecting your skin's rate of ageing, its susceptibility to oxidative stress and inflammation as well as the effect diet has on it.

What's a oftenotype?

Differences in our genes are what make us unique. The specific version of a gene you carry is called your genotype.

What do the letters ACTG mean?

The chemicals that your DNA code is made of can be represented by four letters - A, C, T and G. By looking at these letters, we can see which specific DNA code you carry.

Phenotype

Your phenotype is a description of your observable traits. For example, calling someone tall would be a description of their height phenotype. In the realm of skin, your predisposed level of melanin production can be an observable phenotype and will be presented in darker hair or skin colour.

Pioftmentation

Pigmentation refers to the process or presence of colouration in biological tissues, particularly in the skin, hair, and eyes. It involves the synthesis and distribution of pigments such as melanin that impart colour to these tissues. Pigmentation serves various functions, including protection against harmful UV radiation, regulation of heat absorption, and contributing to individual traits and characteristics.

Refined Carbohydrates

Refined carbohydrates undergo processing that strips them of its natural fibres and nutrients, involving the removal of bran and germ layers from whole grains. This results in finer-textured, longer-shelf-life products lacking essential nutrients and dietary fibre. Common sources include white flour, white rice, sugary cereals, pastries, and processed snacks. Unlike whole-grain carbohydrates, refined ones are swiftly digested, potentially causing rapid blood sugar spikes and contributing to health issues like insulin resistance and obesity when consumed excessively.

Collaoften

Collagen is the most abundant protein in the human body and is a major constituent of connective tissues, including skin, tendons, ligaments, cartilage, and bones, providing structural support and integrity to those tissues. Known for its robust, fibrous structure, collagen is composed of amino acids, providing crucial structural support. Its main role is imparting tensile strength and elasticity to tissues, aiding stability. In addition to its structural function, collagen participates in cell signalling and tissue repair.

Elastin

Elastin is a protein that is a crucial component of the extracellular matrix, providing elasticity and resilience to various tissues in the body. It is predominantly found in connective tissues within body structures such as skin, arteries, lungs, and ligaments. Elastin allows these tissues to stretch and recoil, providing flexibility and maintaining structural integrity. Elastin works in conjunction with collagen to support the mechanical properties of tissues like the skin.

Glycation

Glycation is a natural chemical reaction in your body where sugar molecules, such as glucose or fructose, bind to proteins, fats, or genetic material. Although this process occurs naturally, excessive amounts can be detrimental. In glycation, a sugar molecule attaches to a protein or fat, resulting in the formation of advanced glycation end products (AGEs). Particularly concerning in proteins, these AGEs can alter their structure and function by cross-linking and modifying amino acids. Such changes can impact these proteins' ability to perform specific functions. Additionally, AGEs can accumulate, especially in slowly regenerating tissues like collagen in the skin, blood vessels, and cartilage, linking them to ageing and various age-related diseases

With those definitions out of the way, let's move into your report!

How do oftenes influence the skin's functions?

Your skin, the body's largest organ, is a crucial defensive barrier shielding vital organs from toxins, injuries, sunlight, and temperature changes. From appearance and elasticity to inflammation and ageing, the blueprint encoded in your genes plays a pivotal role in defining your skin's individuality and susceptibility to external factors such as diet, lifestyle, and sun exposure.

While genetic variants play a role, genes alone do not dictate your skin's fate. By making thoughtful adjustments to your lifestyle and diet and following an individualised skincare routine, you can exert influence over the ageing process.

Genetic variations in the enzymes that contribute to collagen production as well as in proteins like elastin that play a large role in skin elasticity, may make you more susceptible to skin sensitivity, premature ageing, and the formation of lines and wrinkles, particularly after sun exposure. Implementing certain habits like high SPF sunscreen and targeted moisturisers can enhance matrix protein synthesis, visible skin firmness, and providing a shield against environmental factors.

For pigmentation, proteins involved in melanin production dictate your skin, hair, and eye colour. Genetic factors influence the amount and distribution of melanin, impacting your skin's response to UV light.

There's a common thought that if you have dark skin, you don't need protection from the sun because your skin produces more melanin. This isn't true and even those with darker skin should ensure to wear a high, broad spectrum SPF to protect against the damaging effects of UV light.

Variations in the melatonin-related gene may make red-haired individuals with fair skin more resistant to certain opioid-based anaesthesia. This genetic difference affects how they metabolise and respond to specific drugs. It is however important to note that individual responses to anaesthesia are influenced by a mix of genetic and environmental factors.

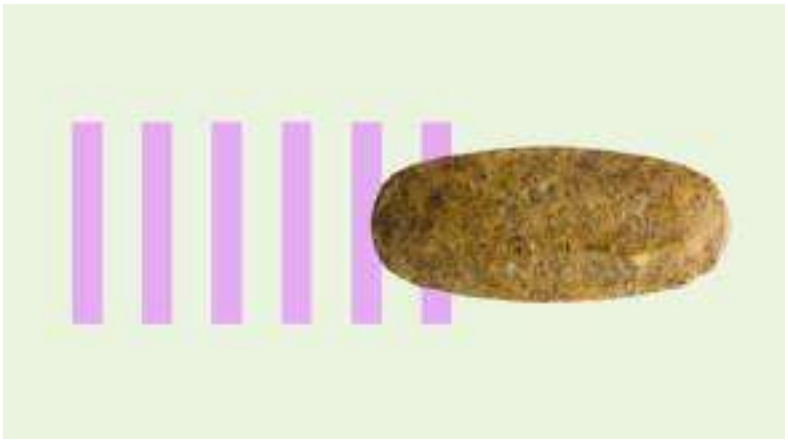
Skin & Diet

When starting to understand the impact of diet on skin health, we encounter the normal features of cellular activity including oxidative stress, detoxification and inflammation all influenced by free radicals produced by the body’s metabolic processes as well as its genetic predisposition to manage them effectively. These can wreak havoc on cell components causing uncontrolled inflammation which accelerates skin ageing.

Dietary intervention can be very effective as a protective mechanism because enzymes that neutralise free radicals are augmented by dietary antioxidants like Vitamins A, C, E, and Selenium found in fruits and vegetables like carrots, citrus fruits and bell peppers.

Additionally, refined carbohydrates can also impact skin health. The body's sensitivity to refined carbohydrates, influenced by genetic variations, impacts the amount of glucose available to cause glycation. This causes an accumulation of AGE-related damage and is proportional to dietary intake of refined carbohydrates as well as your individual genetic sensitivity. AGEs affect nearly every type of cell in the body and are thought to be a factor in accelerating ageing and reducing skin resilience.

Recognizing the impact of dietary choices and genetic factors on skin health empowers individuals to make informed decisions that contribute to both internal protection and external radiance.



Skin Aofteinoft

Skin is "dynamic" it is constantly being broken down and rebuilt in response to external and internal stimuli (e.g. sunlight and metabolic oxidation). Internal skin ageing is determined by our genetics, whilst extrinsic skin ageing is caused by external factors such as diet and environment. Skin ageing is determined by 3 characteristics: collagen degeneration, degeneration of elastic fibres, and dehydration.

Based on your results, you have a medium rate of intrinsic skin ageing.

What is it?

Skin ageing can be split into two causes: intrinsic and extrinsic. Whilst intrinsic ageing is determined by genetics, extrinsic ageing is determined by external factors - with up to 90% of extrinsic skin ageing thought to be caused directly by UV radiation. Skin ageing is caused by the degradation of compounds in our skin including collagen and elastin.

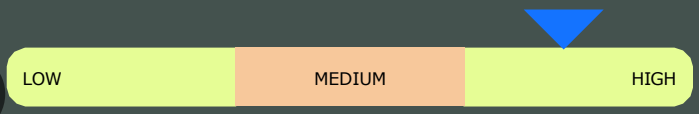
How to improve

The effects of our genetic variations on our skin structure can be ameliorated by taking protective measures and understanding our genetic makeup can help us ensure we take the correct steps towards improved long-term skin health. Establishing a routine incorporating sunscreen with a high SPF and specific moisturizers may boost the synthesis of matrix proteins, improve the visible firmness of the skin, and enhance cell differentiation, creating a protective barrier against environmental factors.

Your Skin Aofteinoft Genes

Based on your results, you have a medium rate of intrinsic skin ageing.

For full genetic details contact us.



We have looked at genes associated with the generation and maintenance of integral compounds found in the skin's structure, including collagen and elastin. MMP1 and MMP3 are associated with increased breakdown of collagen fibres as part of the normal skin repair process in response to damage. The COL1A1 gene is associated with collagen structure, whilst the ELN gene has been tested due to its association with skin elasticity.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Your body breaks down skin compounds at a medium rate, so it's important to avoid tobacco smoke, including passive and if you live in a polluted urban area, try to take time away from there.

Using a good quality UV sunscreen when in sunlight will be very beneficial to you in preserving the elasticity of your skin.

It remains crucial for you to include dietary antioxidants, like those found in berries and colourful vegetables, to support your skin's elasticity over time. Astaxanthin, an antioxidant found in salmon but can also be taken as a supplement, has been shown to reduce MMP expression and can be useful for maintaining skin health.

Sensitivity to Refined Carbohydrates & Glycation

Refined carbohydrate sensitivity can result in higher levels of glycation; a natural process in our body that happens because of sugars, like glucose or fructose. When there's too much sugar in our skin fibers, our body fires up an internal reaction. This reaction produces glycation end products (AGEs) which are detrimental in various processes important for skin health by damaging the structure of dermal collagen and elastin. Common symptoms of skin with glycation issues include premature ageing, such as wrinkling and sagging; weakened elastin and collagen; and a reduced ability for skin to quickly rehabilitate. The presence of AGEs also make the skin more vulnerable to oxidative stress, smoking and UV exposure.

Based on your results, you have a medium genetic sensitivity to refined carbohydrates and an average risk of glycation associated with carbohydrate intake.

What is it?

The total state of oxidative stress on the healthy body, and the accumulation of AGE-related damage is proportional to the dietary intake of refined carbohydrates which is also affected by individual genetic sensitivity to these macromolecules. AGEs affect nearly every type of cell and molecule in the body, and are thought to be one factor in ageing and some age-related chronic diseases.

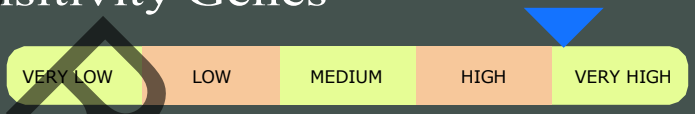
How to improve

Some factors can cause more AGEs to form in the skin, including diets that are high in sugar, exposure to UV radiation from the sun, and external skin stressors such as smoking and pollution. Implementing efficient and individualised skincare, including more antioxidant-rich foods in your diet and smoking cessation are all ways to improve factors influencing AGE formation.

Your Refined Carbohydrate Sensitivity Genes

Based on your results, you have a medium genetic sensitivity to refined carbohydrates and an average risk of glycation associated with carbohydrate intake.

For full genetic details contact us.



These genes have been tested due to their implication in refined carbohydrate sensitivity and glucose metabolism, which in turn affects the amount of AGEs produced in the body.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

You have a medium sensitivity to refined carbohydrates therefore, managing your blood sugar levels, by reducing the amount of refined sugar you consume in your diet, will help reduce glycation and its effects on your skin.

Glycation and its skin ageing effects are made worse by sun exposure. Ensure you wear broad spectrum SPF every day to help slow the signs of ageing and protect against skin cancer.

Boost your antioxidant intake by including foods such as blueberries, pomegranate and green tea in your diet to help protect skin cells from glycation.

Pioftmentation

Melanin is a substance in your body that produces hair, eye and skin pigmentation. The more melanin you produce, the darker your eyes, hair and skin will be. The amount of melanin in your body depends on a few different factors, including genetics and how much sun exposure your ancestral population had.

Based on your results, you are likely to have lower levels of melanin, and therefore more likely to have light skin, hair and eyes.

What is it?

Melanin is a natural substance that determines the colour of hair, skin, and eyes in people and animals. Special cells called melanocytes make melanin. Everyone has the same number of melanocytes, but some people make more melanin than others. If these cells make just a little melanin, your hair, skin, and eyes can be very light. If your cells make more, then your hair, skin, and eyes will be darker. The amount of melanin your body makes also depends on your genes. If your parents have a certain amount of melanin, you could have the same amount and a similar skin tone. Melanin provides protection against damaging UV light, which is why it is typical for people in sunnier climates to have darker skin, however it may also reduce the amount of Vitamin D produced in response to sunlight.

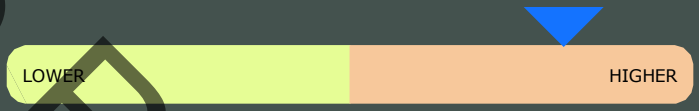
How to improve

If you have less melatonin and therefore lighter skin, it is advised to always use sufficient UV- protection to protect against sun damage. When it comes to darker skin, the higher melatonin levels offer some protection, however, even those with darker skin should ensure to wear a high, broad-spectrum SPF to protect against the damaging effects of UV light.

Your Pioftmentation Genes

Based on your results, you are likely to have lower levels of melanin, and therefore more likely to have light skin, hair and eyes.

For full genetic details contact us.



These genes have been tested due to their involvement in the production and distribution of melanin in the body.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

You have lower melanin in the body and should therefore prioritise good quality UV protection.

Extended exposure to the sun is recognised for its potential to cause skin cancer by damaging genes that typically prevent cancerous growth. Evidence suggests significant variations in skin cancer risk based on skin type, with lighter skin being more prone to various types of skin cancer.

Applying sunscreen to your face is especially important and should be reapplied throughout the day.

Nickel Sensitivity

Nickel allergy is a common cause of allergic contact dermatitis — an itchy rash that appears where your skin touches a usually harmless substance. Nickel allergy is often associated with earrings and other jewelry. But nickel can be found in many everyday items, such as coins, zippers, cellphones and eyeglass frames.

Based on your results, you do not have a genetic predisposition to developing a nickel sensitivity, but the possibility cannot be entirely excluded.

What is it?

One of the most common contact allergens is nickel which is present in most jewellery. Continued exposure can result in itchy rashes in sensitive people, these rashes can become extremely uncomfortable and develop into painful lesions.

How to improve

Individuals with a nickel allergy should avoid sources of nickel exposure. Things like jewellery or body piercings, watchbands, clothing fasteners, such as zippers, snaps and bra hooks, belt buckles, eyeglass frames, coins, metal tools, keys, military "dog-tag" ID, and E-cigarettes.

Your Nickel Sensitivity Genes

Based on your results, you do not have a genetic predisposition to developing a nickel sensitivity, but the possibility cannot be entirely excluded.

For full genetic details contact us.

TNF has been tested due to its involvement in the inflammation pathway, whilst GSTM1 and GSTT1 have been tested due to their implications in removal of toxins from the body.

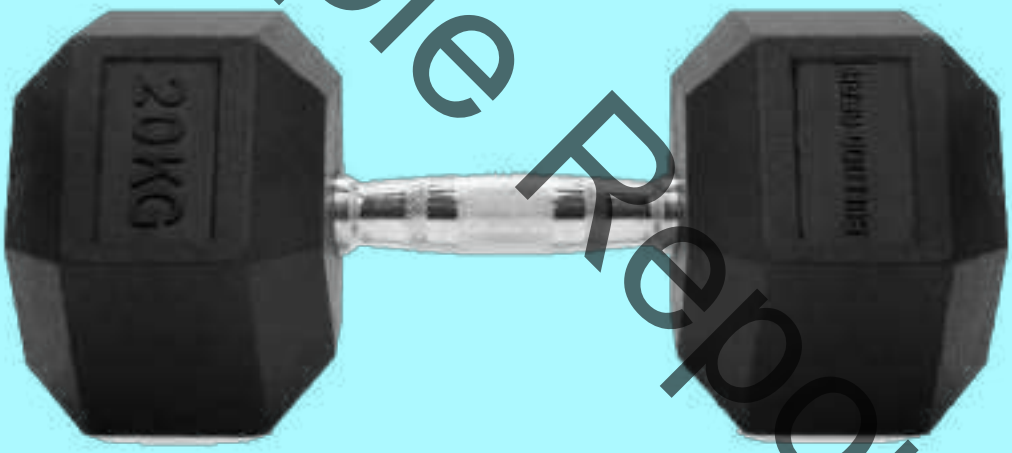
Advice for you

Here’s some recommended lifestyle tips and practices based on your result

Although your genes do not lean towards a nickel sensitivity, it is still possible to present with a sensitivity. If you suspect an allergy, have it diagnosed.

Precision fitness report

Made for (Client’s name)



Hey (Client's name)

Welcome to your fitness report!

You've taken the first step on your personalised fitness journey.

There is no one size fits all approach that works for everyone, especially when it comes to fitness. The path to wellness is a personalised one!

Your fitness report will reveal how your unique genetic makeup influences your training style, your recovery rate and your predisposition to injury, giving you the tools you need to tailor your training sessions to allow you to get the most out of your workouts..

Within your report, you'll learn which training style your body best responds to, how long your recovery time needs to be, as well as what steps you should be taking to reduce your risk of injury.

Read on to find out more about your genes and their effects on your fitness journey.

Helpful terms

You'll see some of the same terms come many times throughout your report. Here are some definitions you can refer back to:

What's a oftene?

A gene is a section of your DNA that contains instructions for building a specific protein. This report will focus on genes affecting your tendency to different exercise styles, your recovery efficiency, and your injury predisposition.

What's a oftenotype?

Differences in our genes are what make us unique. The specific version of a gene you carry is called your genotype.

What do the letters ACTG mean?

The chemicals that your DNA code is made of can be represented by four letters - A, C, T and G. By looking at these letters, we can see which specific DNA code you carry.

What is a phenotype?

Your phenotype is a description of your observable traits. For example, calling someone tall would be a description of their height phenotype. In terms of fitness and exercise, a high injury predisposition is an example of a phenotype that we can address by adjusting our training plan and taking proactive steps.

Power

Power is the ability to use maximal force in as little time as possible. It is a vital component of many aspects of sports performance, including acceleration, jumping and throwing.

Endurance

Endurance is the ability to perform work or withstand physical stress over long periods of time. Endurance performance relies on many of the body's systems - chiefly the cardiovascular, aerobic and muscular systems.

VO2 max

The maximum or optimum rate at which the heart, lungs, and muscles can effectively use oxygen during exercise, used as a way of measuring aerobic capacity. VO2max is more trainable for some people than others.

Recovery

Your recovery profile in this report refers to your body's ability to recover between workouts, rather than during them. Ensuring you are fully recovered before your next workout will improve your training response and reduce the risk of injuries. We analyse genes that play a role in two key aspects of recovery: oxidative stress and inflammation levels.

Inflammation

Inflammation is the body's natural response to harmful stimuli like pathogens or muscle damage during exercise. It involves the activation of the immune system to repair and strengthen tissues. While acute inflammation is a normal part of muscle adaptation, maintaining balance through rest, proper nutrition, and listening to your body is crucial for overall well-being.

Oxidative stress

Intense exercise elevates the production of reactive oxygen species (free radicals) that can harm cellular components. The body's defence system, antioxidants, counters these radicals to prevent oxidative damage. Oxidative stress results from an imbalance between free radical production and the body's ability to neutralise them, potentially causing damage to DNA, proteins, and lipids, linked to ageing and various health issues.

With those definitions out of the way, let's move into your report!

Fitness & health

In a diverse world with dynamic demands, fitness is now a universal aspiration, extending beyond physical appearance to holistic well-being—embracing physical, mental, and emotional health.

The path to fitness is deeply personal, influenced by individual goals, preferences, genetics, and health considerations. Fitness is a dynamic equilibrium of exercise, nutrition, and lifestyle choices, evolving with personal growth. It encompasses various disciplines, from strength training to yoga, catering to diverse interests and abilities.

Furthermore, the rise in genomics research focused on fitness has revealed numerous connections between genetic variations and how our bodies respond to various forms of exercise.

Achieving desired fitness goals requires making informed choices that align with an individual's unique genetic profile and insights into these profiles can be leveraged to personalise the exercise program, maximising the benefits derived from training sessions.

Regular exercise sustains heart health, enhances circulation, and lowers cardiovascular disease risk. It aids the immune system and contributes to weight and glucose control, reducing risks like diabetes, hypertension, obesity, and certain cancers.

It also maintains bone density, serves as a stress reliever, curbs cognitive decline, and promotes social interaction for overall well-being.

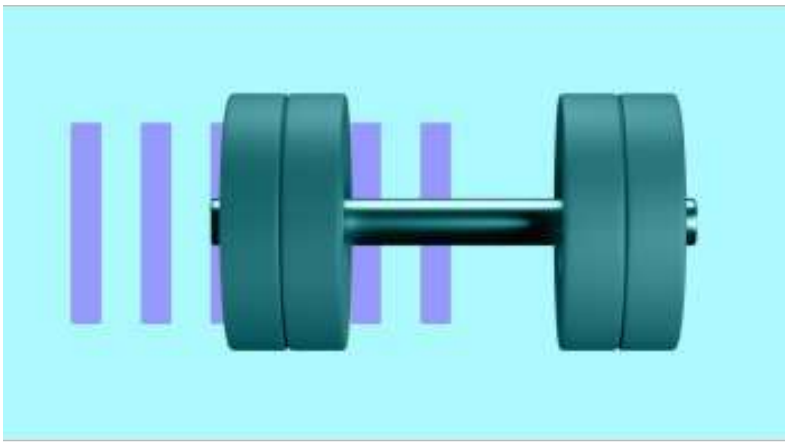
Achieving fitness goals is not merely a physical triumph; it's a celebration that uplifts self-esteem, confidence, and preserves strength and mobility with age.

Fitness & your DNA

Genetic variations in fitness intricately shape the body's response to inflammation and oxidative stress induced by exercise thereby shaping how efficiently the body recovers from physical activity, predicting our susceptibility to injuries.

Understanding the impact of our genes on fitness will determine whether power or endurance training is more likely to yield substantial benefits. Certain studies indicate up to a 20-fold performance improvement in genetically matched training compared to unmatched training.

These genetic factors also play a pivotal role in determining the body's reaction to an increase in blood pressure and its ability to distribute oxygen to cells during physical activity. Moreover, gene variations influence the body's capacity to release energy through metabolism and dictate the speed at which it can mobilise collagen and proteins to facilitate the regeneration of new tissues, blood vessels, and muscle fibres.



Your Traininoft Intensity Response

Everyone's fitness benefits from both power and endurance training. However, some people are genetically predisposed to responding to one better than the other. Understanding your power/endurance response allows you to leverage your genetic makeup for more personalised training.

You have a balanced power and endurance training profile.

What is it?

Understanding your power/endurance profile allows you to match your training to your genetics. Evidence shows that following a genetically matched training plan can achieve three-fold improvements in results compared to genetically mismatched training!

How to improve

We recommend using this result to tweak and influence how you build the type of workouts for your goal - not to change your goal altogether. You might choose to prioritise a certain type of exercise over another, based on where you can achieve the most bang for your buck!

Your Traininoft Intensity Genes

You have a balanced power and endurance training profile.

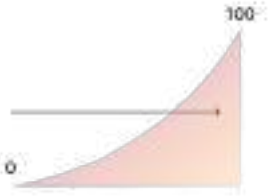
For full genetic details contact us.

We've tested the most researched genes available in relation to exercise response to help you prioritise your training and maximise your response.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Take advantage of your mixed power and endurance result by including both low intensity and high intensity exercise in your training.



Aim to keep your training in the context of your goal - if you're a runner for example, include both short sprints and long distance work.

Use your result to guide how you spend your training time - with your genotype you should aim to include an even mix of power and endurance activities.

Your Aerobic Trainability

VO2 max is a measure of the maximum rate at which your body can effectively use oxygen during exercise. It's a popular measure of progress in endurance athletes, and genetic variants can influence our ability to improve it

You have a very high VO2 max trainability

What is it?

VO2max means maximum volume of oxygen and it is one measure of aerobic capacity. It depends on our lungs, circulatory system and muscles to intake, transport and utilise oxygen as efficiently as possible. You can accurately measure your VO2max in a sport science lab, or use a simple HR equation to estimate it. The highest ever recorded VO2max was performed by a cyclist called Oskar Svendsen, at 97.5ml/kg/min!

How to improve

VO2max is defined as the maximum amount of oxygen that our bodies can utilise during exercise, and so to improve it we must work in this zone. That means performing longer "aerobic" intervals of 2-6 minutes in duration, where the breathing rate is reaching its maximum level. Exercises that are weight-bearing (such as running) and/or involve the full body (such as rowing) tend to push our VO2max the most.

Your Aerobic Trainability Genes

You have a very high VO2 max trainability

For full genetic details contact us.

VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH

The genes we've analysed here play a role in your response to aerobic training: their functions relate to the production of mitochondria, blood vessel growth and the use of oxygen during exercise.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Take advantage of your rapid response to aerobic training by including aerobic work to develop your fitness.

Although VO2 Max is an important metric, it is not the only one that matters for endurance performance, so don't place undue emphasis on this alone.

You can do a VO2 Max test in a local sport science lab, or use a simple HR equation to estimate your current VO2 Max.

Your Recovery Efficiency

Recovery is one of the most important aspects of any training plan. If you don't allow for proper rest between training sessions, you could compromise future workouts

You have a fast recovery profile

What is it?

Allowing the correct amount of recovery time between workouts is incredibly important. Insufficient recovery could mean that you are unable to perform in your next workout, and could also compromise the gains you make from your previous workout. Recovery relates to how quickly our bodies can counter the oxidative and inflammatory stresses caused by exercise

How to improve

There are a number of ways to aid recovery. Antioxidants and Omega-3 fatty acids in your daily diet can help your body deal with free radicals and inflammation respectively. Sleep is also a large factor: the body needs to synthesise proteins faster than it breaks them down to build up muscles and recovery, and sleep provides the opportunity to do this effectively

Your Recovery Genes

You have a fast recovery profile

For full genetic details contact us.

VERY FAST	FAST	MEDIUM	SLOW	VERY SLOW

The genes we've analysed here play a role in your levels of metabolic stress after exercise. These functions relate to elements of oxidative stress and inflammation levels

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Consume Omega-3 in your diet to support your body's anti-inflammatory response.

Eat a variety of colourful fruit and vegetables to support your natural antioxidant systems.

Your fast recovery profile allows for more frequent training, with less than 48 hours rest needed between hard workouts.

Your Injury Predisposition

Everyone is susceptible to injuries when training, however some of us have a higher genetic predisposition to injury than others. People with a higher injury risk should include injury prevention sessions in their training plan

You have a medium injury predisposition

What is it?

Injuries are a normal and commonplace occurrence in all sports and exercise, and sometimes they are unavoidable. However, often injuries are a result of overuse or a body's varying ability to recover and repair following a workout. Understanding this allows us to take pre-emptive action to reduce this risk as much as possible

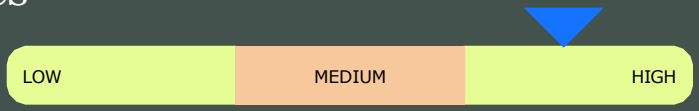
How to improve

"Prehabilitative" exercises for the most at-risk areas, such as achilles tendons, can massively reduce our risk of injury. Loading the tendon in a controlled way on a regular basis will strengthen it without the risk of further damage. Improving inflammatory response, for example by including foods rich in Omega-3 fatty acids, can also help reduce injury risk.

Your Injury Predisposition Genes

You have a medium injury predisposition

For full genetic details contact us.



This group of genes have been selected for their role in predisposition to the most common exercise-related soft tissue injuries

Advice for you

Here's some recommended lifestyle tips and practices based on your result

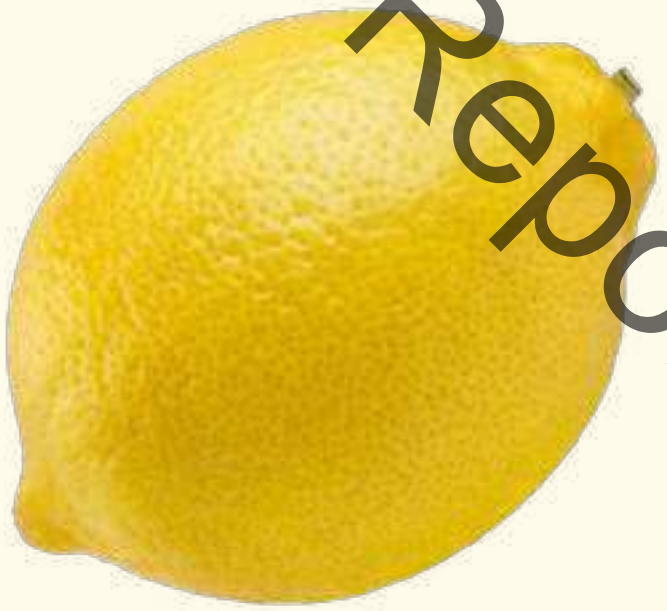
For your genotype we recommend adding these achilles tendon strengthening exercises into your routine a couple of times per week; free standing calf raises, seated calf raises, eccentric loading and plyometrics.

To strengthen your patella tendon - Include bodyweight squats, reverse lunges, eccentric single leg squats and leg extensions in your regular exercise routine.

To strengthen your shoulders and rotator cuff - Include cable external rotations, seated rows and band pull-aparts. For your genotype we advise adding a selection of these to your exercise routine a few times each week.

Precision nutrition report

Made for (Client’s name)



Hey (Client's name)

Welcome to your nutrition report!

You've taken the first step on your personalised nutrition journey.

Nutrition trends come and go, but it will always be true that there is no one size fits all approach that works for everyone. The path to wellness is a personalised one!

Your nutrition report will reveal how your unique genetic makeup influences your requirement for vitamins and micronutrients, giving you the tools you need to tailor your nutrient intake to your own specific needs.

Within your report, you'll learn about the role each nutrient plays in the body, how your DNA modifies what you need, and what steps you can take to optimise your intake.

Read on to find out more about you.

Helpful terms

You'll see some of the same terms come many times throughout your report. Here are some definitions you can refer back to:

What's a oftene?

A gene is a section of your DNA that contains instructions for building a specific protein. These proteins can give rise to the expression of certain physical traits or cell functions, which in turn determines our unique physical and biological characteristics.

What's a oftenotype?

Differences in our genes are what make us unique. The specific version of a gene you carry is called your genotype.

What do the letters ACTG mean?

The chemicals that your DNA code is made of can be represented by four letters - A, C, T and G. By looking at these letters, we can see which specific DNA code you carry.

Phenotype

Your phenotype is a description of your observable traits. For example, calling someone tall would be a description of their height phenotype. In the realm of nutrition, a higher sensitivity to certain foods could be an example of an observable phenotype that we can correct with diet.

Micronutrient

Micronutrient is a broad term to describe nutrients that we need in very small amounts for healthy growth and metabolism. This category includes vitamins but also minerals, essential fats like omega-3s, and others.

Vitamin

A vitamin is an organic (carbon based) micronutrient that we need for functional metabolism. They are known as 'essential' because the body can't make them, so we need to consume them to maintain good health.

Enzyme

An enzyme is a protein based catalyst that accelerates the speed of chemical reactions. The vast majority of processes in our bodies are governed by enzymatic activity. Without enzymes, life would be impossible - essential biochemical reactions would not occur fast enough to sustain us.

Coenzyme / cofactor

Cofactors and coenzymes are compounds that bind to enzymes and help them speed up chemical reactions. There are slight differences in how cofactors/ coenzymes are defined, but the terms are often used interchangeably.

With those definitions out of the way, let's move into your report!

Nutrition & health

We can categorise all nutrients into two broad groups - macronutrients and micronutrients.

Macronutrients are named as such because we need them in large amounts. We use them for energy and as building blocks. They come in 3 sub-groups: fat, carbohydrate, and protein, which together make up the bulk of our food.

Micronutrients are so named because we need them in relatively small amounts. But make no mistake, just because we only need a small amount does not minimise their importance. Micronutrients are absolutely essential to life, they are vitally important compounds that our bodies can't produce on their own.

In fact the very word vitamins stresses their importance. The name hails back to their discovery by Dr Casimir Frank, who was studying birds being fed only rice and noted that their health deteriorated rapidly when deprived of 'vital amines', later termed vitamins.

Micronutrients is a catch all term that includes vitamins but also other compounds that we need in small amounts to maintain our health - this includes minerals, antioxidants, and essential fats like omega-3.

Macronutrients like carbohydrates, proteins, and fats are essential for energy and vital bodily functions. At the same time, micronutrients such as vitamins and minerals play a crucial role in physiological processes, ensuring proper growth and health. Micronutrients act as key cofactors for enzymes, akin to oil for a machine, facilitating essential chemical reactions in the body.

The balance between macronutrients and micronutrients is vital for maintaining overall well-being and supporting the body's intricate mechanisms.

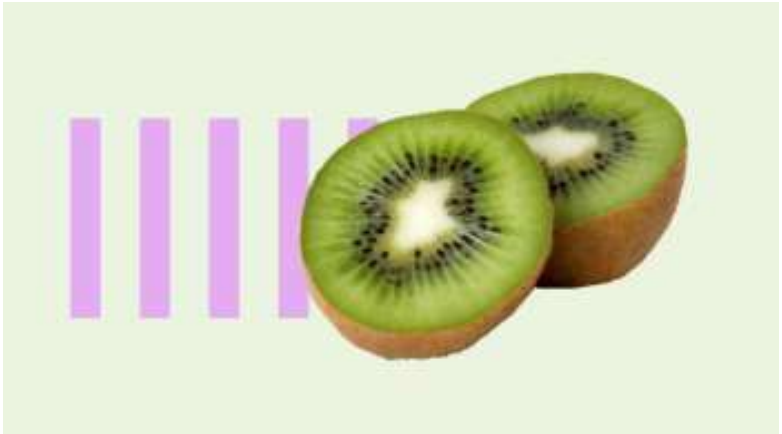
Nutrition & your DNA

We're all different. We see it in the world around us every day - different bodies, different personalities, different behaviours. You might not appreciate just how granular those differences are. Even on the smallest biological level, there are minute differences that affect how we respond to our environment.

Your DNA is a code for building protein. Protein is what our molecular machines, enzymes, are made of and what dictates our ability to digest and utilise macronutrients effectively.

Small differences in that code can result in very slight changes in the structure of enzymes and the molecules involved in macronutrient metabolism. These differences in structure mean that our molecular machines perform ever so slightly differently.

In the context of nutrition, these differences mean that our vitamin and mineral requirements will be different and we need to adjust to our diet needs to suit our individual predispositions.



Vitamin A

Vitamin A is a fat-soluble vitamin that is essential for vision, immune function, reproduction and growth.

Based on your results you have a normal need for vitamin A

Function

Vitamin A is essential for the maintenance of rod and cone cells that absorb light in the eye. Elsewhere in the body, vitamin A influences the expression of many genes and has a wide ranging impact on development, immunity, and growth.

Deficiency

Vitamin A deficiency can cause poor immune function, dry skin, sleep problems and hormonal imbalances. It can also cause problems with vision, in the most extreme cases resulting in blindness. It's important to be cautious with vitamin A intake because it can become toxic at high levels. Vitamin A toxicity shares many of the symptoms of deficiency, and also includes nausea, fatigue, hair loss and poor bone health.

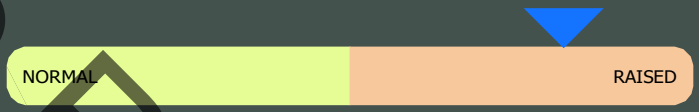
How to improve

Vitamin A comes in 2 forms: active vitamin A (retinol), and precursors such as beta-carotene. Retinol is only found in animal foods like organ meats, dairy, eggs and fish. Vitamin A precursors are compounds that can be converted into retinol, like the carotenoids found in colourful plant foods. Liver and fish oils have the highest concentration of vitamin A among food sources, while colourful fruits and vegetables are excellent sources of carotenoids.

Your Vitamin A Genes

Based on your results you have a normal need for vitamin A

For full genetic details contact us.



The genes tested were selected because they are involved in the conversion of vitamin A precursors to active vitamin A.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Animal foods such as liver, eggs and milk are a good source of retinol (active vitamin A), which is useful for people who are poor converters of beta-carotene.

Beta–carotene from fruits is more easily absorbed than from vegetables so enjoy mangoes, melons and oranges. Other vitamin A-rich plant foods include leafy greens, sweet potatoes, broccoli, carrots, and squash.

The beta-carotene in plants is often bound to protein and fibre so is difficult to absorb raw. Steam or bake your vegetables to increase the absorption. Avoid boiling, as this causes nutrients to be lost to the water.

Riboflavin

Riboflavin is a B-vitamin involved in many roles in the body, being particularly important for energy metabolism and growth.

Based on your results you have a normal need for riboflavin

Function

Riboflavin is an essential component of two major coenzymes, flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD), which play essential roles in energy production, growth, metabolism of fats, and breakdown of drugs. Riboflavin also helps to maintain a healthy limit on homocysteine levels, which is an inflammatory amino acid that can contribute to cardiovascular disease if not controlled.

Deficiency

Riboflavin deficiency is rare and shares symptoms with many other vitamin deficiencies. However, it can be characterised by redness or soreness around the throat and tongue, and dry cracked lips. It can also result in frequent migraines, and vision becoming very sensitive to bright lights. Because riboflavin is used to release energy from food, high fat or high carb diets increase the need for riboflavin. High levels of activity and exercise will also increase requirements.

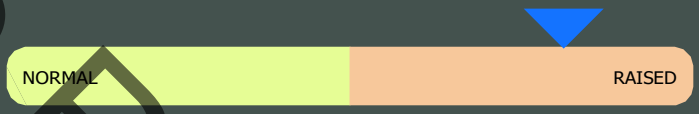
How to improve

Animal foods are typically rich in riboflavin, with liver, beef, turkey, chicken, eggs, and dairy being the best sources. Plant sources of riboflavin include almonds, yeast extract, and quinoa.

Your Riboflavin Genes

Based on your results you have a normal need for riboflavin

For full genetic details contact us.



The genes tested were selected because they influence riboflavin requirement.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Riboflavin is very sensitive to light, and will break down if exposed to bright light. For example, milk in a carton will preserve its riboflavin content better than milk in a transparent bottle. Store your riboflavin sources in a cool dark place to minimise this issue.

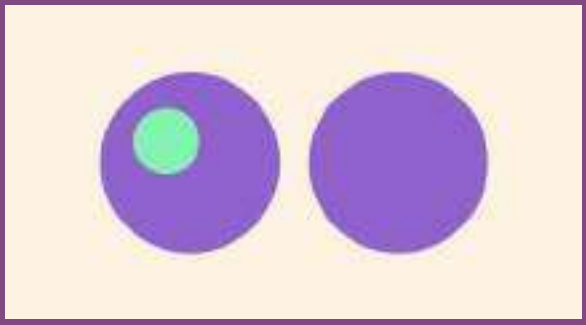
Riboflavin is very sensitive to industrial processes. Blanching, milling, and fermenting may result in significant losses of riboflavin. For this reason, it's best to choose whole food options and avoid processed foods.

The best sources of riboflavin are liver, beef, turkey, chicken, eggs, milk, and almonds.

Vitamin B6

Vitamin B6 is a water-soluble vitamin that is naturally present in many foods that plays a broad role in the body.

Based on your results you have a normal need for vitamin B6



Function

Vitamin B6 contributes to the activity of a huge range of enzymes (proteins that control chemical reactions) in the body. 140 enzymes are influenced by vitamin B6 so it is crucial to have sufficient intake of this vitamin. New evidence suggests that vitamin B6 also contributes to the antioxidant system by generating hydrogen sulphate, which supports proper blood vessel function, healthy blood clotting, and proper brain functions.

Deficiency

Dietary source of vitamin B6 are versatile and it is difficult to get vitamin B6 deficiency, except malnutrition, alcoholism and absorption issues (Crohn's disease, celiac disease, etc). High protein intake and mental stress also increase B6 requirements. Insomnia, problems with mood or mental health, and anemia are common signs of needing more B6.

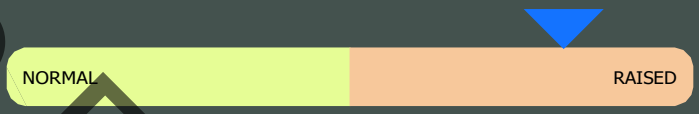
How to improve

Good sources include salmon, chicken breast, beef, pork, sweet potatoes, bananas. The vitamin B6 in plant foods is more difficult to absorb, so for vegans it is important to have a varied diet to improve chances of absorption from different sources. Nutritional yeast is a good supplement for vegans to include.

Your Vitamin B6 Genes

Based on your results you have a normal need for vitamin B6

For full genetic details contact us.



The genes tested were selected because they influence vitamin B6 requirement

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Vitamin B6 in plant-based sources is bound to sugars and it is less bioavailable than B6 from animal sources. If you are vegan or vegetarian, aim for a variety of plant-based sources of vitamin B6, as some will be easier to absorb than others.

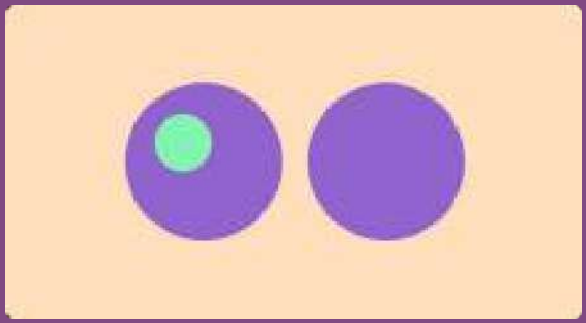
Vitamin B6 like the rest of vitamins B is easily washed out by excess of water so steam or microwave your meals rather than cook them. If you need to cook them, please do it in very small amount of water.

Around 15% of people have difficulty converting plant based B6 into its active form. If you are vegan and have a raised genetic need for B6, consider supplementing with B-complex or nutritional yeast.

Folate

B-vitamins are a group of compounds that help the body to release energy from food and transport it around the body

Based on your results you have a normal need for B-group vitamins



Function

Folate works together with vitamin B12, B6 and riboflavin as part of a "vitamin network" that is responsible for one carbon metabolism, which underpins many essential aspects of health. Folate intake also prevents high homocysteine levels, which would otherwise increase the risk of cardiovascular diseases, strokes and clotting disorders as well as dysfunctional immune responses. In many chronic inflammatory conditions, for example diabetes, one carbon metabolism is impaired which increases homocysteine and and leads to cardiovascular issues and accelerated aging.

Deficiency

The principal symptom of folate deficiency is high levels of homocysteine, which can damage the cardiovascular system and contribute to faster biological aging. Folate levels are particularly important during pregnancy, deficiency at this time can cause spina bifida in the baby.

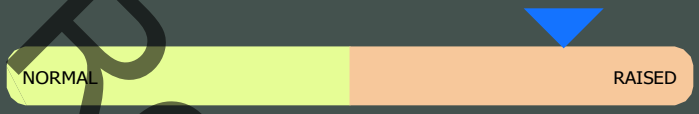
How to improve

The richest sources of folate are dark green leafy vegetables (turnip greens, spinach, brussel sprouts, broccoli, romaine lettuce), beans, peanuts, sunflower seeds, orange juice, and whole grains.

Your Folate Genes

Based on your results you have a normal need for B-group vitamins

For full genetic details contact us.



The genes tested were selected because they are involved folate metabolism and transport

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Depending on the food source, folate can be found in different forms. In bread, meat, eggs and milk it has a mono-glutamate tail. In plant foods it has a polyglutamate tail. Men absorb mono-glutamate sources better than polyglutamate sources. Women can absorb both sources equally well.

Folate can be hard to absorb from raw vegetables due to being bound to fibre and protein. Lightly cook your vegetables with a small amount of olive oil to improve folate absorption.

Avoid boiling as a cooking method as a large amount of the folate content will be lost to the water. Steaming is preferable.

Vitamin B12

Vitamin B12 functions as a coenzyme within the body. It is the only vitamin that contains a metallic element, cobalt, so is sometimes referred to as cobalamin.

Based on your results you have a normal need for vitamin B12

Function

Vitamin B12 helps maintain brain function and development, neurological function, and the production of red blood cells. It is part of the vitamin B and folic acid network and contributes to one carbon metabolism, which underpins many aspects of good health. Vitamin B12 is also required for converting protein and fat into energy and is essential for cell division and DNA synthesis.

Deficiency

Vitamin B12 is stored in the liver, so it can take a long time for deficiency to develop. Vitamin B12 is found almost exclusively in animal foods, so vegetarians and vegans are at the greatest risk of deficiency. The elderly are also vulnerable to deficiency because our ability to absorb vitamin B12 declines as we age. Deficiency is seen in as much as 40% of the elderly population. Deficiency may cause various health problems, such as megaloblastic anemia, appetite loss, sore tongue, neurological problems and dementia.

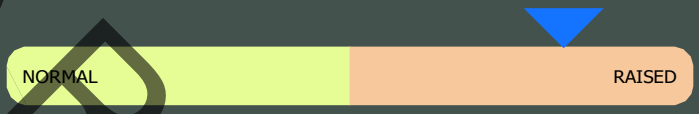
How to improve

Animal-sourced foods are virtually the only dietary sources of vitamin B12. These include meat, dairy products, seafood and eggs. Tempeh and some kind of algae, such as nori seaweed, may also contain small amounts of vitamin B12.

Your Vitamin B12 Genes

Based on your results you have a normal need for vitamin B12

For full genetic details contact us.



The genes tested were selected because they are involved in the absorption and useage of B12.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Fruits and vegetables contain zero vitamin B12. Therefore vegans and vegetarians are high risk for deficiency and need to manage their intake carefully.

Spirulina, chlorella and other algae have some vitamin B12 but it is mostly a pseudo-form that cant be used by humans. The best source of plant-based vitamin B12 is nori seaweed and dry purple laver. Nutritional yeast is another non-animal alternative.

In the event of deficiency, vitamin B12 supplements are a safe and effective way to restore levels.

Vitamin C

Vitamin C is an essential nutrient involved in the repair of tissue, the formation of collagen, and the production of certain neurotransmitters. It also important for immunity and the antioxidant system. Most animals are able to synthesize their own vitamin C, however humans have to get it from the diet.

Based on your results you have a normal need for vitamin C

Function

Vitamin C plays many roles in the body. It is well known as an antioxidant, and importantly maintains the glutathione antioxidant system which protects against chronic disease. It is critical for collagen production which is the connective tissue in your skin, muscles, gums and bones. Vitamin C is involved in the production of many hormones, including the stress hormones adrenaline and cortisol, thyroid hormone, oxytocin, antidiuretic hormone, and sex hormones. Because vitamin C plays so many roles, we need it for strong bones, immunity, resistance to stress, energy, brain function, libido and healthy skin.

Deficiency

Vitamin C deficiency results in scurvy, which causes fragile blood vessels, bleeding gums, and slow wound healing. It can also have severe consequences, such as a heart attack, irregular heartbeat, and internal bleeding. Diabetic people have higher needs for vitamin C intake, as higher blood glucose levels compete with vitamin C for uptake to important target tissues, mainly immune cells. Smoking damages vitamin C and dramatically increases the need for it in the diet.

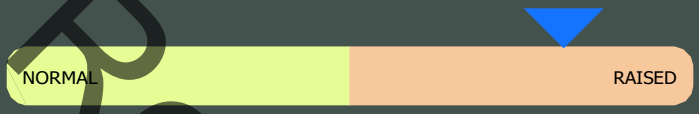
How to improve

Fresh fruits and vegetables are the richest source of vitamin C, kiwi and red peppers are some of the best sources. Herbs and spices like paprika and parsley are packed with vitamin C as well. Many people get the majority of their vitamin C from potatoes as these are eaten in large amounts compared to other foods. Fresh meat and fish contain a small amount of vitamin C but not enough to meet our minimum requirements.

Your Vitamin C Genes

Based on your results you have a normal need for vitamin C

For full genetic details contact us.



The genes tested were selected because they influence blood levels of vitamin C

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Vitamin C is very sensitive to heat and can break down during cooking, so make sure to include raw and lightly cooked sources of vitamin C in your diet.

If you want to preserve vitamin C, do not use boiling as a cooking method as the heat + water is particularly bad for vitamin loss. Steaming is preferable.

Potatoes are a good source of vitamin C. Cooking them with the skin on will preserve a higher vitamin C content than if you peel them.

Vitamin D

Vitamin D is considered a "hormone-like" vitamin, which governs bone mineralisation, immune responses, inflammation and even aging processes.

Based on your results you have a normal need for vitamin D

Function

Vitamin D is found in some foods, but is also produced by our skin when it's exposed to sunlight. It has long been known to improve bone health by helping the body retain calcium and phosphorus. Vitamin D is essential for healthy muscle function, and studies have also shown that vitamin D can reduce inflammation, improve immunity, and support insulin signalling. Many of the body's cells and tissues have receptors for vitamin D, suggesting it plays an important role in many processes.

Deficiency

Due to the essential role vitamin D plays in bone health, deficiency can lead to rickets in children or osteomalacia in adults - conditions of painful, deformed bones. Other consequences of deficiency are neuromuscular conditions like tetany, which results in muscle tremors and confusion. Vitamin D levels are inversely correlated with BMI, so overweight people typically require more. Though vitamin D is generally safe, extremely high intakes over a long period of time can result in the calcification of soft tissues.

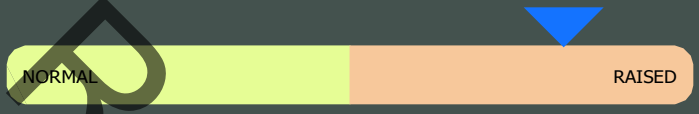
How to improve

The skin can produce all the vitamin D we need if exposed to enough sunlight. However, we get very little sunlight in modern life due to an indoor lifestyle, clothing, and UV-blocking creams. Vitamin D production is particularly poor in northern latitudes like the UK, where the sun is weak for much of the year. In the diet, vitamin D is mostly found in animal foods. Fatty fish such as salmon, tuna, and herring are some of the best sources of vitamin D. Other sources include egg yolk, dairy products, and animal liver. Mushrooms are the best plant-based source of vitamin D.

Your Vitamin D Genes

Based on your results you have a normal need for vitamin D

For full genetic details contact us.



The genes tested were selected because they are involved in vitamin D absorption, transport, activation and utilisation.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

The best source of vitamin D is sun exposure. In the UK, 13 minutes of midday sunlight exposure during summer three times per week is enough to maintain healthy levels among Caucasian adults. The darker your skin, the longer you will need in the sun to produce vitamin D.

During the winter, the sunlight is not strong enough for vitamin D synthesis so it needs to be obtained through diet. Factor 15 UV protection or above will also block vitamin D synthesis almost entirely.

The best dietary sources of vitamin D are fatty fish such as salmon, tuna and herring, pastured egg yolks, and certain mushrooms.

Vitamin E

Vitamin E is a fat-soluble vitamin that is a powerful antioxidant, which we need to protect our tissues from wear and tear as we age.

Based on your results you have a normal need for vitamin E

Function

Vitamin E is a powerful antioxidant and protects the cell membranes from oxidative and toxic stress, which is particularly important for blood vessels, brain health, and fertility. It also supports immune function and reduces the risk of clots forming in the blood, and helps protect us from chronic, degenerative diseases like heart disease and cancer. Recent studies have shown that vitamin E consumption slows the shortening of telomere and cellular senescence, both hallmarks of biological and cellular aging.

Deficiency

Vitamin E is found in a wide range of plant foods, and we only need a very small amount. Therefore, deficiency is rare and is usually only found in people with a medical condition that prevents absorption of fats, or a rare genetic condition known as ataxia. Symptoms of deficiency include weakened immunity, coordination problems, numbness in the arms and legs, and issues with vision.

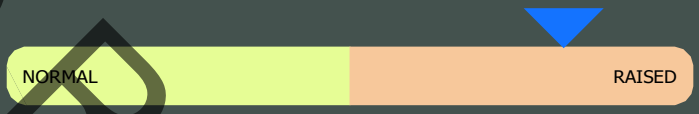
How to improve

Vitamin E is found in plant-based oils like sunflower oil and red palm oil (only use sustainably sourced), and also in nuts, seeds, fruits, and vegetables. Most fresh whole plant foods are good sources of vitamin E, and grass fed animal products also have good levels.

Your Vitamin E Genes

Based on your results you have a normal need for vitamin E

For full genetic details contact us.



The genes tested were selected because they are associated with vitamin E levels

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Vitamin E is fat soluble, and therefore is absorbed best when consumed together with a fat source. Add some healthy fats to your vegetables to maximise vitamin E absorption.

Vitamins A, C and E work protect each other from oxidative damage and have complementary biological functions, so it's beneficial to consume sources of vitamin A, C and E together in the same meal.

If consuming vitamin E as a supplement, make sure it contains alpha-tocopherol along with a healthy fat for absorption.

Iron Overload

Hemochromatosis is a condition where the body absorbs too much iron (i.e. iron "overload") and can result in liver disease, arthritis and heart conditions. If you have a high risk for iron overload it is important to monitor your iron intake and blood markers of iron status such as ferritin, hepcidin or transferrin saturation.

Based on your results you have a low risk for hemochromatosis

Function

Iron is an essential mineral and important component of hemoglobin, the substance in red blood cells that carries oxygen from your lungs to transport it throughout your body. Iron supports a strong immune system and is also necessary to maintain healthy cells, skin, hair, and nails.

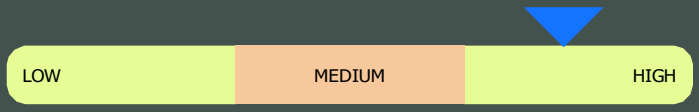
How to improve

Those with a higher risk of iron overload should monitor their iron intake and regularly monitor their blood levels for various iron status markers. It is also important to avoid drinking excessive amounts of alcohol – this can increase the level of iron in your body and put extra strain on your liver.

Your Iron Overload Genes

Based on your results you have a low risk for hemochromatosis

For full genetic details contact us.



The genes tested were selected as they influence gut absorption of iron and risk of iron overload.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

There are two types of dietary iron: heme and non-heme. Heme iron is found in meat and seafood. Non-heme is found in plants, meat, seafood, and fortified products. Heme iron is more bioavailable than non-heme iron, meaning that it's more easily absorbed by your body.

Vitamin C, or ascorbic acid, enhances the bioavailability of non-heme iron. In addition, meat and seafood can also enhance the absorption of nonheme iron.

Phytate, or phytic acid, is a compound found in grains and legumes that decreases the absorption of iron. Other compounds in plant foods, known as polyphenols, can also decrease iron absorption.

Iron Deficiency

Low iron status is determined by measuring certain blood markers such as ferritin, hepcidin or transferrin. Low iron stores can lead to anemia, which is associated with fatigue, pale skin, weakness, shortness of breath and dizziness. Several genes can impact the risk of having low iron status.

Based on your results, you have an increased risk for low iron.

Function

Iron is an essential component of hemoglobin, which is the molecule in red blood cells that carries oxygen. It has a role in body temperature regulation, muscle activity, immune function and even brain activity.

Deficiency

People suffering from iron deficiency anemia don't always show symptoms at first, but as the condition gets worse they may experience tiredness and shortness of breath. Heart palpitations and pale skin are other common symptoms.

How to improve

To minimise your risk for low iron, meet the RDA for iron and consume food sources of vitamin C with non-heme iron-containing foods to increase iron absorption. Focus on foods with a high bioavailability such as animal products (heme iron) and cooked spinach. Men aged 19 years and older and women over 50 should aim for 8 mg/day. Women 19-50 years old should aim for 18 mg/day.

Your Iron Deficiency Genes

Based on your results, you have an increased risk for low iron.

For full genetic details contact us.

The genes tested were selected due to their involvement in regulation of iron in the body, and absorption of iron from food.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

The best animal sources of dietary iron include red meat, fish and shellfish, liver and eggs.

The best plant-based sources of dietary iron include dark green leafy vegetables, dried fruits such as figs and apricots, bean, chickpeas, nuts and seeds.

Large amounts of foods with high levels of phytic acid, such as wholegrain cereals can make it harder for your body to absorb iron.

Antioxidants

Antioxidants are compounds that protect against oxidative stress and free radical damage. The antioxidant system reduces natural wear and tear on our tissues that occurs with age, toxin exposure, metabolic dysfunction, and various illnesses.

Based on your results you have a raised need for antioxidants

Function

The antioxidant system protects cells from free radicals, which is critical for protecting general health and against most degenerative diseases, including fatty liver disease, heart disease, and cancer. It is especially important to energy metabolism, thyroid function, immunity, and insulin sensitivity.

Deficiency

Glutathione is the master antioxidant produced by the body. Antioxidants in the diet helps to preserve or boost glutathione function. Vitamins A, C and E are the best known antioxidants, but many minerals play antioxidant roles as well, especially zinc, selenium, copper and manganese. A diet low in fresh foods, especially fruits and vegetables, can reduce glutathione function and lead to a decline in general health.

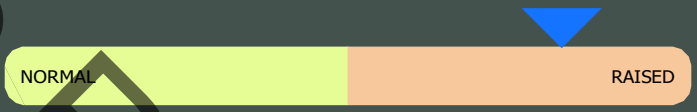
How to improve

Antioxidant compounds are often brightly coloured, so in general eating a wide range of colourful fruits and vegetables is a great way to ensure intake of antioxidant vitamins A, C and E. It's also important to get enough of the antioxidant minerals. The best sources of zinc, copper and selenium are seafood, red meat, poultry, seeds and nuts. Copper is also found in chocolate. Manganese sources include whole grains, legumes, nuts, seeds, coffee, tea, spices, and mussels.

Your Antioxidant Genes

Based on your results you have a raised need for antioxidants

For full genetic details contact us.



The genes tested were selected because they are involved in the antioxidant system.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Dietary antioxidants will support your internal antioxidant system. Include a wide range of colourul fruits and vegetables in your diets to maximise antioxidant intake.

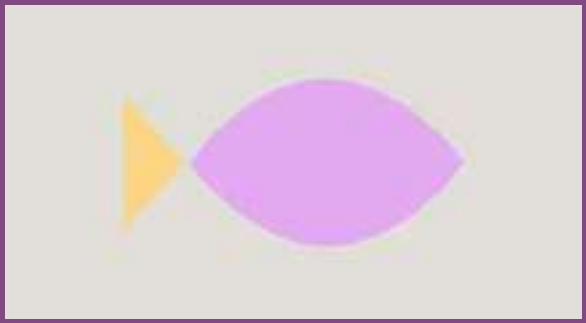
Make sure you are consuming enough of the minerals zinc, copper, selenium and manganese. These are found in seafood, meat, and nuts.

Some foods contain preformed glutathione (a powerful antioxidant), these include spinach, avocados, asparagus and okra.

Omeofta-3

Omega-3s are a family of essential fats that must be obtained from the diet. They come in several forms - ALA, EPA and DHA, with DHA being the most important.

Based on your results you have a normal need for Omega-3



Function

Omega-3s play an anti-inflammatory role in the body and help to reduce chronic inflammation that is driven by modern lifestyles. DHA is a key structural component of your eyes, nervous system, and other cell membranes. Healthy omega-3 levels can help with recovery from various biological stressors such as poor diet, injury and infection.

Deficiency

Omega-3 deficiency, particularly DHA deficiency increases the risk of chronic low-grade inflammation which can accelerate the development of many chronic conditions related to aging. Deficiency can also cause issues with vision, mental focus, and mood. The balance of omega-3 to omega-6 in the diet is important, those with high omega-6 intake should increase their omega-3 consumption. Vegetarians and vegans need significantly higher omega-3 intake because the plant form of omega-4, ALA, does not convert well to DHA.

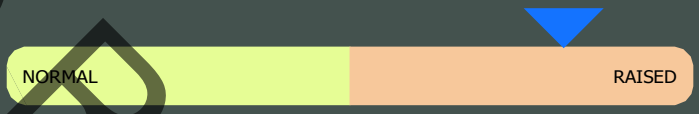
How to improve

DHA is found in large amounts in seafoods (mainly fish, also some crustaceans and certain algae used in supplements) and in smaller amounts in egg yolks when chickens are raised on pasture. A diet low in seafood and based on grain-fed animal products is the major risk factor for low DHA levels.

Your Omeofta 3 Genes

Based on your results you have a normal need for Omega-3

For full genetic details contact us.



The genes tested were selected because they are involved in the conversion of EPA and ALA to DHA

Advice for you

Here's some recommended lifestyle tips and practices based on your result

In the western diet, we have a far higher intake of omega-6 than omega-3. This imbalance drive chronic, low grade inflammation. For optimal health, these should be close to equal intake.

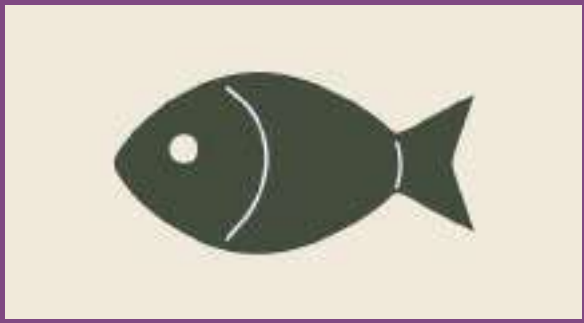
The best sources of omega-3 are fish oil and wild fatty fish like salmon, tuna, and mackerel. Farm raised fish are not good sources. Walnuts, flaxseed oil, and chia seeds are rich in the ALA form of omega-3 , but this converts very poorly to the more useful EPA and DHA forms. To account for this low conversion, vegans and vegetarians need to have a higher intake of ALA.

Processed vegetable oils like corn, sunflower, hemp, safflower, and soy are very high in omega-6 and should be minimised where possible.

Saturated Fat Sensitivity

There are two main types of dietary fat; unsaturated and saturated. We should all aim to eat more unsaturated fat and less saturated fat.

Based on your results you have a very high sensitivity to saturated fat



Function

Fat is a great source of energy and provides essential fatty acids, which our bodies can't make on their own and helps us to absorb vitamins. There are some misconceptions around the effect of fats on our health; it's not always bad and a moderate amount of unsaturated fat in the diet allows your body to function properly and prevent disease. However, high intakes of saturated fat are associated with raised cholesterol which may increase your risk of clogged arteries and heart disease.

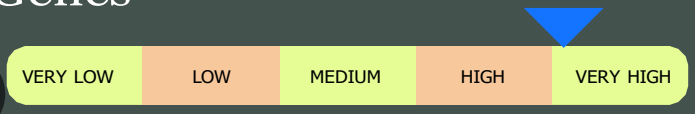
How to improve

Aim to get the majority of your dietary fat from unsaturated fat sources. Fish, avocados, nuts, seeds and olive oil are all good, nutritious sources of unsaturated fats. Try to limit your intake of saturated fats such as butter, cheese, processed or fatty meats and baked goods such as cookies.

Your Saturated Fat Sensitivity Genes

Based on your results you have a very high sensitivity to saturated fat

For full genetic details contact us.



The genes tested were selected because they each play a key role in how your body uses fats. Their functions affect many processes that happen in your body, including how your body absorbs, transports and metabolises different fats.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Aim for less than 7% of your daily calories through saturated fat intake. Be conscious of fats in cream, butter and oils. Think about increasing portions of healthy foods on your plate to reduce your fat intake. With every meal try to include one palm-sized portion of protein dense food and one fist-sized portion of vegetables.

Try replacing saturated trans fats with unsaturated fats like olive oil, nuts, seeds, avocados and oily fish.

Research has shown that understanding your genetic response helps people to adhere to dietary changes, so knowledge of your result may help you stick to healthier habits for longer.

Carbohydrate Sensitivity

Carbohydrates are a food group that make up a significant portion of most people's diets.

Based on your results you have a medium sensitivity to carbohydrates

Function

Carbohydrates are important in giving your body the energy it needs to function via conversion into glucose, and are the main source of fibre your body needs to maintain a healthy gut. The trick with carbohydrates is to understand how you personally respond to them, and get a handle on how different types of carbohydrates impact your body.

How to improve

Carbohydrates are grouped into two different categories: Low GI and High GI carbohydrates. Low GI carbohydrates tend to be unprocessed and fibre-rich, and promote positive health by delivering fibre, vitamins and minerals. These carbohydrates are converted into glucose slowly, providing sustainable energy levels throughout the day. High GI carbohydrates produce a faster, higher spike in blood sugar levels and are often processed and lacking important nutrients. Aim to get the majority of your carbohydrates from Low GI sources.

Your Carbohydrate Sensitivity Genes

Based on your results you have a medium sensitivity to carbohydrates

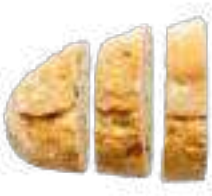
For full genetic details contact us.

VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH

The genes tested were selected because they each play a key role in how your body metabolises and absorbs carbohydrates, how sensitive you are to insulin, and how your body uses glucose.

Advice for you

Here's some recommended lifestyle tips and practices based on your result



Carbohydrate intake has a direct impact on your blood sugar levels. When glucose is released too quickly into your body, it disrupts your blood sugar levels. Over time, this can have a negative impact on your health and make it more difficult to manage your weight.

Focus on including more unrefined carbohydrates in your diet, such as fruit, vegetables, legumes and whole grains. This will increase your fibre intake - leading to a healthier digestive system!

Limit your intake of refined carbohydrates. As well as obvious sources such as processed foods and sugary drinks, refined carbohydrates are also found in low-fibre foods such as rice-cakes, fruit juice and ketchup.

Lactose Intolerance

All humans are born with the ability to digest lactose, by generating the enzyme lactase. However, this ability turns off in most of the world's population after early life, apart from those with the variant of the LCT gene tested here.

Based on your result, you are tolerant to lactose.

Function

The LCT gene provides instructions for making an enzyme called lactase, which helps to digest lactose, a sugar found in milk and other dairy products. Babies' bodies make the lactase enzyme so they can digest milk, including breast milk. After the weaning phase in most humans, the production of lactase decreases. However, some humans continue to produce lactase throughout adulthood, a trait known as lactase persistence.

How to improve

In lactose intolerance, the body doesn't make enough lactase to break down lactose. Instead, undigested lactose sits in the gut and is broken down by bacteria. This causes gas, bloating, stomach cramps, and diarrhea. This can be managed by not consuming dairy products, lactose-free milk is also a great way to keep calcium in the diet without the associated issues.

Your Lactose Tolerance Genes

Based on your result, you are tolerant to lactose.

For full genetic details contact us.

TOLERANT | INTOLERANT

The LCT gene has been tested as it is responsible for creating lactase.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

If you can't tolerate any lactose, you can always choose lactose-free milk or dairy alternatives such as almond, soy or oat milk.

Some people who are intolerant to lactose can still include up to 12g of lactose per day. Pay attention to your symptoms when consuming lactose to better understand your tolerance level.

Fermented dairy sources such as kefir and quark are typically lower in lactose. These are also excellent sources of probiotics as they contribute to a healthy digestive system, so are a great source of dairy to include in your diet.

Coeliac Predisposition

Coealiac disease is a condition where your immune system attacks your own tissues when you eat gluten. This damages your small intestine so your body cannot properly take in nutrients.

Based on your results you have a low predisposition for Coeliac disease

Function

Gluten is a protein naturally found in some grains including wheat, barley and rye. It acts as a binder, making dough rise and stay elastic, and helping food hold its shape.

How to improve

People with Coeliac disease have to follow a gluten-free diet, which removes all foods containing or contaminated with gluten. However, since gluten-containing whole grains contain fiber and nutrients including B-vitamins, magnesium and iron, it's important to make up for these missing nutrients elsewhere. Some whole grains are inherently gluten-free, including corn, quinoa, buckwheat and brown rice.

Your Coeliac Predisposition Genes

Based on your results you have a low predisposition for Coeliac disease

For full genetic details contact us.

NORMAL RAISED

The genes tested were selected due to their role in developing Coeliac disease. Having the genetic factor might mean that you will develop Coeliac disease in your lifetime, but it does not mean this is certain.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

People with Coeliac disease can still enjoy foods such as bread and pasta thanks to a wide-range of gluten-free products available in most supermarkets.

Coeliac disease is not the same as gluten intolerance. Whilst people with an intolerance to gluten may experience some discomfort and symptoms in response to eating gluten, Coeliac disease can be very serious when not-detected.

Coeliac disease affects 1 in 100 people in the UK, making it more common than previously thought. Under diagnosis is an issue and it is suggested that up to 500,000 people have not yet been diagnosed.

Fructose Sensitivity

Fructose is a sugar that occurs naturally in fruits, vegetables and honey. When a person is unable to digest or absorb fructose, they may have a fructose intolerance. This may cause bloating, abdominal pain and diarrhea in response to consuming fructose. People with a more severe form of fructose intolerance called hereditary fructose intolerance will develop symptoms in infancy. Without treatment, they may develop life threatening complications, such as liver and kidney failure.

Based on your results you have a normal sensitivity to fructose

Function

Fructose is an important nutrient found naturally in fruit as a component of most healthy diets. It is metabolised in the liver, where it promotes the synthesis of fat. Mutations in the ALDOB gene have been found to cause hereditary fructose intolerance, a condition characterised by nausea and intestinal discomfort following ingestion of fructose.

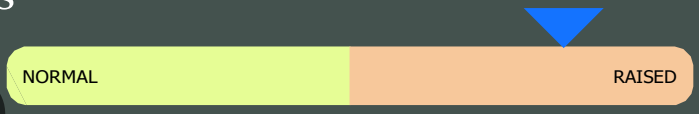
How to improve

Symptoms of fructose intolerance may also be caused by a malabsorption of fructose due to other conditions such as Coeliac disease, excessive consumption of fruit juices, or the presence of an excessively degrading microbial flora.

Your Fructose Sensitivity Genes

Based on your results you have a normal sensitivity to fructose

For full genetic details contact us.



The ALDOB gene has been tested as it is responsible for producing the aldolase B enzyme, which digests fructose in the body.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

In case of fructose malabsorption, avoid fruits that contain large amounts of fructose including cherries, watermelon, pears, apples and mangoes.

Fructose is also found in vegetables such as asparagus, chicory and peas!

Low fructose fruits include blueberries, raspberries, bananas and kiwis.

Salt Sensitivity

Many people eat more than the recommended amount of salt without even knowing it. Salt is often added to pre-prepared foods, so make sure you take a close look at the label.

Based on your results you have a raised sensitivity to salt.

Function

The human body requires a small amount of salt for essential functions such as relaxing and contracting muscles, and maintaining a proper balance of water and minerals. But too much salt in the diet can lead to health complications including high blood pressure, heart disease and stroke. Adults should have no more than 6g of salt per day.

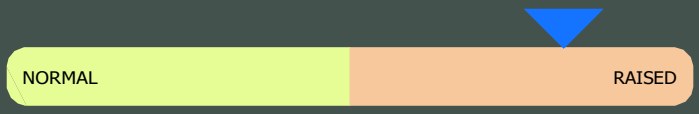
How to improve

The predominant source of salt in the modern adult's diet comes almost entirely from processed foods, so always place an emphasis on whole foods and home cooked meals where possible.

Your Salt Sensitivity Genes

Based on your results you have a raised sensitivity to salt.

For full genetic details contact us.



The genes tested were selected due to the link with predisposition to hypertension when combined with excessive sodium consumption.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Rather than seasoning food with salt, try adding flavour with garlic, lemon, chilli, ginger or herbs.

Always taste your food before adding salt - it may not need it!

Added salt can be found in processed foods which you may not even think of, including cereals and bread. Where possible check the label and choose a low-sodium option.

Alcohol Response

There are conflicting opinions on whether alcohol can ever be considered as healthy. We champion an approach of balance and moderation, so regardless of your genetic profile, we advise not exceeding the recommended daily intake of alcohol.

Based on your results, you have a negative response to alcohol.

Function

The ADH1C gene codes for a protein responsible for assisting the metabolism of alcohol in the body. Depending on your genetics, this gene may result in the production of an amino acid called Valine. Valine results in a lower activity enzyme, which metabolises the alcohol more slowly. This is positively associated with higher levels of HDL ("good" cholesterol) in moderate drinkers.

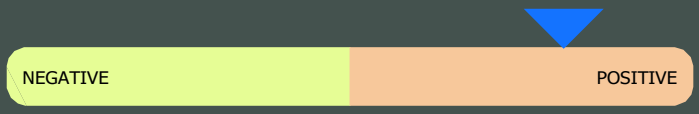
How to improve

Only when drinking in moderation (up to 3 units per day) will there be any positive effects on HDL cholesterol levels in those with the Valine allele.

Your Alcohol Response Genes

Based on your results, you have a negative response to alcohol.

For full genetic details contact us.



We've tested the ADH1C gene due to its role in the metabolism of alcohol and the link to HDL levels.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

One unit of alcohol equals 10ml of pure alcohol, which is roughly the amount of alcohol the average adult can process in one hour.

One unit is the same as half a standard size glass of wine, a single measure of spirit, or half a pint of normal strength (4%) beer.

Alcohol is full of "empty" calories, meaning there is little to no nutritional value derived from drinking it.

Caffeine Sensitivity

Genetics can make a difference in how the body metabolises caffeine, which in turn alters the risk of caffeine consumption on your health.

Based on your results, you have a higher sensitivity to caffeine.

Function

Caffeine is a stimulant, meaning it increases activity in the brain and nervous system. It also increases circulation of chemicals including cortisol and adrenaline in the body. In small doses, caffeine can make you feel refreshed and focused, however too much can lead to feelings of anxiety, trouble sleeping, and more serious health issues.

How to improve

A cup of green tea can have roughly 70% less caffeine than a cup of coffee, so makes a great alternative for those looking to cut their caffeine intake.

Your Caffeine Sensitivity Genes

Based on your results, you have a higher sensitivity to caffeine.

For full genetic details contact us.

LOW HIGH

The CYP1A2 was tested as it is responsible for 95% of caffeine metabolism in the body.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Caffeine content in coffee can vary a lot, depending on the type of beans used and the way they have been roasted. Filter coffee tends to have the most caffeine content, even more than espresso.

Avoid caffeine for 2-3 hours before you go to bed, as it may harm your sleep - even in fast metabolisers!

Caffeine is not only found in coffee, but in teas, energy drinks, soft drinks and even some medicines.

Detoxification Ability - Phase I

Detoxification occurs in the body in two phases. In the first phase, your genetics impact how quickly you metabolise potentially harmful toxins in the liver.

Based on your results you have a raised risk of DNA damage from eating smoked or chargrilled animal protein.

Function

Cooking meats including beef, pork, fish and poultry at high temperatures can create compounds called heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs). These compounds cause damage to DNA and protein in our cells via a process called oxidative stress, which can lead to health problems in the long term.

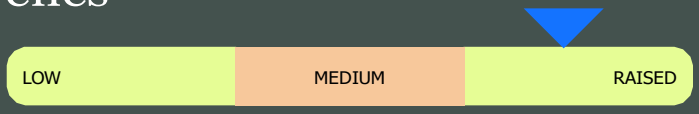
How to improve

Cooking with acidic marinades including lemon, lime, vinegar or wine can reduce the formation of toxic compounds during cooking by up to 90%.

Your Detoxification (Phase I) Genes

Based on your results you have a raised risk of DNA damage from eating smoked or chargrilled animal protein.

For full genetic details contact us.



The genes tested were selected because they influence the speed at which you metabolise potentially harmful toxins in the liver.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Where possible, take steps to protect your meat from direct heat when cooking.

Steaming, poaching and stewing are all methods which offer more protection against the formation of harmful compounds during cooking.

Marinating your meats in acidic based marinades for as long as possible prior to cooking can greatly reduce toxic compound formation.

Detoxification Ability - Phase II

In the second phase of detoxification, certain genetic variants impact how quickly you remove toxins from the body.

Based on your results you have a normal need for cruciferous vegetables.

Function

Once your body has completed detoxification phase I, it moves into phase II to complete the detoxification process. Eating certain types of vegetables can assist your body with this process. These vegetables are part of a family called cruciferous vegetables - named after the cross shape at their base. Cruciferous vegetables include cauliflower, broccoli, brussel sprouts and cabbage.

How to improve

Whenever possible, if you are eating charred meat, try to accompany this with some cruciferous vegetables to assist your body's detoxification process.

Your Detoxification (Phase II) Genes

Based on your results you have a normal need for cruciferous vegetables.

For full genetic details contact us.

NORMAL | RAISED

The genes tested were selected due to their role in supporting phase II of the detoxification process.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

One serving of cruciferous vegetables is equivalent to half a cup of cooked vegetables or a cup of raw vegetables.

If you struggle to include cruciferous vegetables, try adding microgreens from mustard seeds or watercress.

Get creative with your recipes - try roasting florets of cauliflower to intensify its flavour!

Suoftar preference

Sugar intake is partly determined by our sweet taste preference and cravings for certain foods and beverages. There is considerable variability in individuals' preferences and cravings for sweet foods and beverages. There are many factors that may impact your preference for sugary foods including the age that you are first introduced to sweets, and psychological associations between consuming these foods and certain life experiences or emotions.

Based on your results, you are at a normal risk of over-consuming sugar.

Function

The body does not respond well to over-consumption of sugar, the excess blood glucose can cause a number of health issues including blurred vision, cognitive impairment, physical fatigue, difficulty concentrating.

How to improve

Having an occasional sweet treat is fine - no foods should be off-limits. But eating too much sugar can increase your risk of a wide range of health issues, from weight gain and tooth decay to diabetes and heart disease. Try slowly reducing your intake of sugary foods and drinks over a few weeks, as this is likely to be manageable and sustainable.

Your Suoftar Preference Genes

Based on your results, you are at a normal risk of over-consuming sugar.

For full genetic details contact us.

NORMAL	MODERATE	INCREASED

The GLUT2 gene has been tested due to its association with the overconsumption of sugar.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

Pairing foods that contain sugar with foods that contain fiber, protein, or healthy fats can make it easier to reduce your sugary food's portion size. It can also slow the rate at which your body absorbs the sugar.

Be mindful of portion sizes - if you want something, then have it - but try to have a small portion when it comes to sugary treats to keep your daily sugar consumption within the recommended amounts.

It may seem obvious, but keeping sugary foods and drinks out of the house will make them easier to avoid. Try replacing your favourites with healthier alternatives.

Bitter taste perception

Studies report that individuals carrying a C allele on the TAS2R38 gene are likely to be a 'taster' of certain bitter flavours based on the TAS2R38 genotype and can perceive the bitterness in foods and beverages such as cabbage, raw broccoli, soy, green tea, tonic water, coffee and some beers.

Based on your results, you are likely to be a taster of certain bitter flavours.

Function

Our experience of taste differs from person to person due to variations in our taste receptors. The 'supertaster' gene determines if you are able to detect certain bitter compounds found in common foods. Our ability to taste bitterness is thought to protect us against consuming toxic foods.

Your Bitter Taste Perception Genes

Based on your results, you are likely to be a taster of certain bitter flavours.

For full genetic details contact us.

LIKELY NON-TASTER | LIKELY TASTER

The TAS2R38 gene has been tested as it codes for a protein which allows us to detect bitter tastes.

Advice for you

Here's some recommended lifestyle tips and practices based on your result

You are likely a taster of bitter foods, so you might struggle to tolerate the taste of certain foods like broccoli, brussels sprouts, kale, and even coffee. Try adding herbs and spices like basil, coriander, garlic, ginger, or something acidic like lemon juice or vinegar. These will help override bitter tastebud receptors by stimulating other taste receptors such as savoury, salty, or sour.

Try including other vegetables in your diet such as carrots, cucumber, zucchini or peppers to ensure you consume a variety of foods.

Hiding bitter vegetables in larger meals like stews or soups, might neutrilse the taste.