

Optimal Health Report

Created for: **Sample Report**

Date: **21/12/2020**

Practitioner: **Customer Support**



Sample Report

Age	42	Sex	M
Height	195 cm	Weight	127.3 kg
BMI	33.4	Exercise	Never
Smoke		Alcohol	Daily

In order to prepare this report, myDNAhealth has analysed your DNA along with the answers you provided in the questionnaires. This combined approach highlights genetic and lifestyle risk factors which may impact your gene expression, in other words, whether the risk potential is being realised through your diet and lifestyle choices. As you read through your results, please remember that your genes are just your tendency and not your health destiny. Nutritional and lifestyle changes are what make the crucial difference.

Please also be aware that **this report does not diagnose any health conditions or provide medical advice**. Consult with a healthcare or nutritional professional before making any major dietary changes or if you have any other concerns about your results.

How to read your report

In the sections that follow, we have listed potential risk areas where you need to be fairly vigilant when it comes to lifestyle choices. You will see three possible risk scores **Typical**, **Moderate** or **Elevated**. Remember, your genes are merely the potential you have and may not be expressing themselves all the time. It is best to adopt healthy eating and exercise habits that will support your overall risk potential.

Everyone has some potential genetic risks, however, whether they are expressing or not is the true determining factor as to whether they need continued support or not. Don't treat the individual genetic variants, rather support yourself holistically using sleep, stress management, exercise and good nutrition from a range of healthy foods for overall health. If you think you may need some extra support from supplements, please remember to always consult a nutrition or healthcare practitioner, who will assess your overall risk alongside your DNA results and will be able to provide you with the qualified, expert advice.

We are very happy that you joined myDNAhealth and we trust that you benefit greatly.

Yours sincerely,
myDNAhealth Clinician Team



Legend



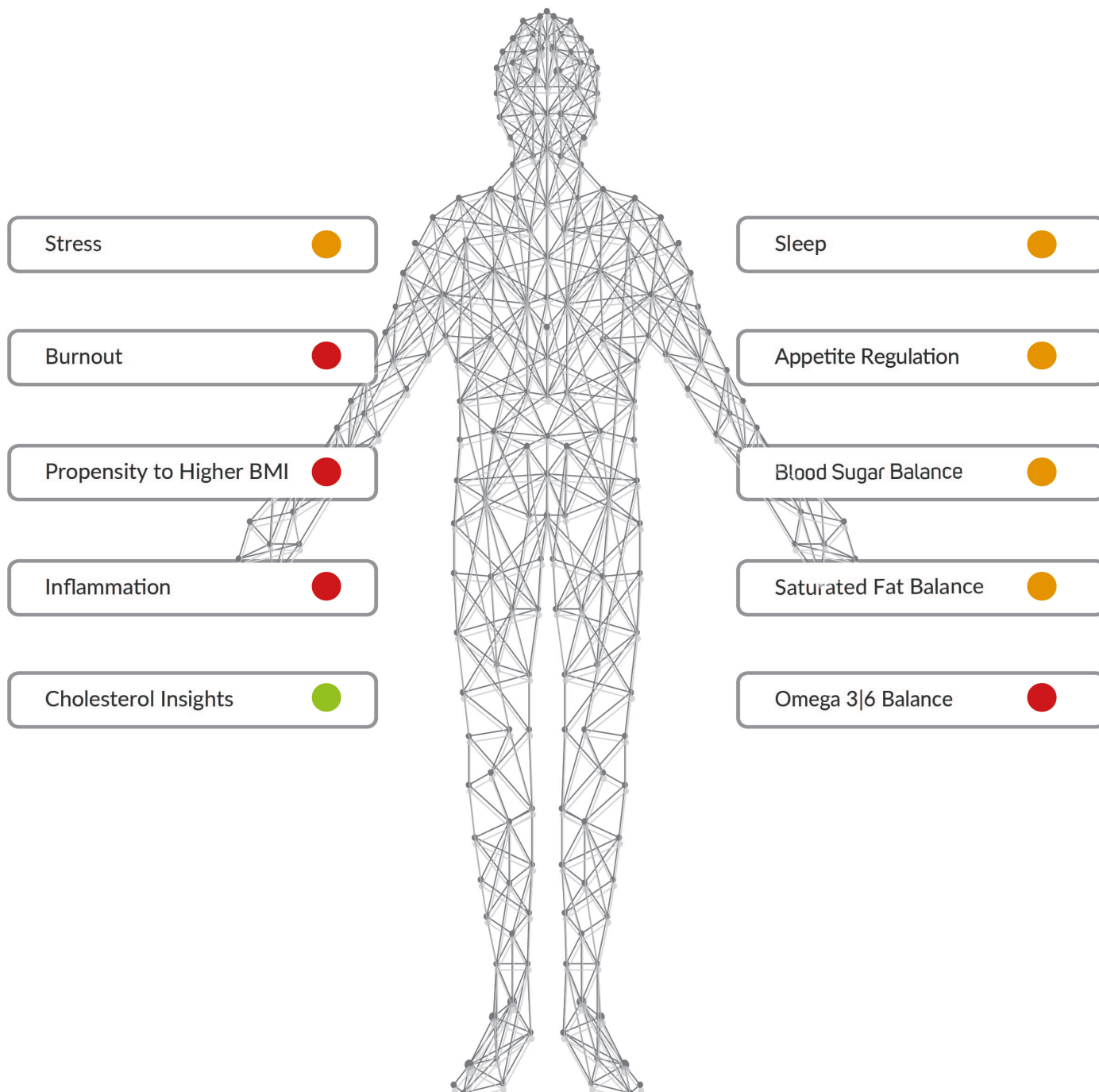
Typical



Moderate



Elevated



Nutritional Requirements and Sensitivities

Lactose Intolerance



Caffeine Metabolism



Vitamin D



Recommended Diet: Reduced Carbohydrate Eating Plan

Recommended Exercise: Strength (Power)



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Appetite Regulation - **Moderate**

According to the genetic variants as well as the questionnaire you filled in, you have a moderate risk for food cravings which can put you at risk of excessive weight gain.



Propensity to higher BMI - **Elevated**

Your score indicates that you may have a propensity to higher BMI. We are increasingly understanding that higher BMI and risk of obesity is a complex interplay between our genetics, lifestyle and environment. Your risk score is a measure of many different factors across of all of these areas and is calculated from your DNA test and consultation questionnaires results.



Blood Sugar Imbalance - **Moderate**

Your overall score indicates this is an area that needs dietary and lifestyle support to provide future protection against developing blood sugar dysregulation conditions such as hyperglycaemia and insulin resistance. To determine the risk score, we have assessed your genetic variants including ADIPOQ, GCKR, PPARG and TCF7L2 alongside the blood sugar sensitivity questionnaire to indicate if you may be symptomatic.



Saturated Fat Balance - **Moderate**

Your score indicates that this is an area that needs dietary support in order to reduce risks associated with impaired saturated fat metabolism and/or changes in blood triglyceride levels. To determine the risk score, we have assessed your genetic variants including APOA2 and APOA5 alongside the dietary fat intake questionnaire to indicate if you may be over consuming some fats.



Omega 3/6 Imbalance - **Elevated**

Your overall score indicates a risk for essential fatty acid imbalance due to increased or decreased enzyme function responsible for omega-3 (FADS1) and omega-6 (FADS2) metabolism in the body. To determine the score we analysed your genetic variants alongside the dietary fat intake questionnaire and essential fatty acids deficiency checker questionnaire.



Cholesterol Insights - **Typical**

Your score indicates you may be at lower risk of an unbalanced cholesterol lipoprotein profile. If you are at all concerned, contact your healthcare provider for further discussion. To determine the score, we analysed your genetic variants including PPARG, GCKR, FABP2 and APOA5 alongside the dietary fat intake questionnaire.



Sleep - **Moderate**

Your overall score indicates that you may be predisposed to experience poor sleep patterns. To determine the risk score, we have assessed your genetic variants (CLOCK) and sleep questionnaire results.



Stress - **Moderate**

According to the genetic variants you may be more sensitive to stress and your stress questionnaire results indicate that you are experiencing levels of stress. Life stressors are among the risk factors for depression and increasingly research is evidencing links to upregulation of the key areas of the immune system involved in inflammation.



Burnout - **Elevated**

According to the genetic variants you may be more sensitive to burnout and your questionnaire result also indicates that you are experiencing levels of burnout due to prolonged stress. Burnout can affect well-being and quality of life in various ways. This can lead to poor physical and mental health, as well as a sense of isolation from other people.



Inflammation - **Elevated**

You have the genetic predisposition for inflammation, and according to your inflammation questionnaire result, you may be experiencing symptoms of inflammation. The overall score suggests you may be more prone to inflammation. To determine the risk score, we have assessed your genetic variants including IL6 Receptor (cytokine), TNF alpha (cytokine involved in systemic inflammation), MnSOD and questionnaire results.



Risk for Vitamin D Deficiency - **Elevated**

You have genetic variants which may predispose you to a vitamin D deficiency. In addition to bone health, emerging evidence from clinical studies has indicated that vitamin D deficiency is associated with several inflammatory diseases. Please discuss getting your vitamin D levels checked with your nutritional or healthcare practitioner.



Caffeine Sensitivity - **Moderate**

You are a slow metaboliser of caffeine and should limit your caffeinated drinks. Excessive consumption of caffeine can increase your risk of cardiovascular problems such as hypertension.



Lactose Intolerance - **Moderate**

You have the genetic variants that may predispose you to being lactose intolerant. Lactose intolerance is a digestive problem that begins in the small bowel. Lactose is a natural sugar found in milk and other dairy products. If symptomatic you may benefit from limiting or removing dairy from the diet.



Reduced Carbohydrate Eating Plan

Our nutritionist has recommended a Reduced Carbohydrate dietary approach due to your genetic predisposition for impaired sugar metabolism. The dietary guidelines are designed to help you remove added sugars and refined carbohydrates from the diet in order to maintain an even blood sugar level. In addition, ensure adequate intake of protein alongside the lower 'sugary' carbohydrates at meal times.

Your overall results also shows that you may become sensitive to some fats. You can lower your risk through adopting a healthy fat eating lifestyle with exercise.



Power Exercise

According to your results, you are genetically better suited for power/strength exercises and you may enjoy this type of exercise more.

Strength training is a type of exercise specialising in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance and size of skeletal muscle. While aerobic means with oxygen anaerobic means without air/oxygen. It is a short lasting, high intensity activity, where your body's demand for oxygen exceeds the oxygen supply available.



Appetite Regulation

- TT** **CLOCK:** TT allele result shows no significant influence of this genetic variant on the likelihood of weight gain due to changes in appetite stimulation.
- AT** **FTO:** Carriers of the A allele show some increased propensity for a higher BMI, higher body fat percentage due to an increased appetite particularly for saturated fat.
- TT** **MC4R:** TT allele shows no change in eating behaviours due to this variant.

Blood Sugar Balance

- CC** **ADIPOQ:** CC allele shows no association with increased risk of insulin resistance.
- CC** **GCKR:** You are more predisposed to higher fasting blood glucose and insulin levels. You may benefit from increasing consumption of whole-grains and removal of refined sugars from your diet.
- CG** **PPARG:** Carriers of the G variant have been associated with improved insulin sensitivity and being at reduced risk of developing type 2 diabetes. This beneficial effect is thought to be removed in overweight individuals.
- CT** **TCF7L2:** CT allele is associated with a moderate propensity towards insulin resistance. Carriers may benefit from consuming a diet lower in refined carbohydrates and higher in fibre.

Saturated Fat Balance

- CT** **APOA2:** T allele carriers show no changes in Apolipoprotein A-II production and therefore there is no associated effect on saturated fat metabolism.
- AA** **APOA5:** The AA genotype shows no associated changes with fasting blood triglyceride levels.

Omega 3/6 Imbalance

- CC** **FADS1:** CC allele is associated with a functioning D5D enzyme responsible for omega-3 metabolism.
- TT** **FADS2:** TT allele indicates an increased D6D enzyme activity which may impact downstream production of certain omega 6 fats leading to heightened inflammatory state. Carriers may consider reducing omega-6 dietary sources.

Cholesterol Insights

- AA** **APOA5:** AA allele is not associated with changes in cholesterol levels.
- CT** **FABP2:** T allele carriers show a predisposition to higher LDL-cholesterol (which is sometimes known as our 'bad' cholesterol) and lowered HDL-cholesterol (which is sometimes known as our 'good' cholesterol) blood profiles.
- CC** **GCKR:** CC allele is not associated with changes in blood triglycerides or cholesterol.

CG

PPARG: CG carriers of the G variant have been associated with higher LCL Cholesterol levels, particularly in obese individuals who consume higher levels of saturated fat and lower levels of omega 3's. Research has associated omega 3 dietary supplementation with improvements in LDL-cholesterol.

Sleep

TT

CLOCK: The TT genotype has shown to be more likely to have an earlier sleep-wake timing (morning) preference, associated with a tendency to start their activities early in the day.

Stress

TT

CLOCK: TT allele results show more ability to fall into an earlier sleep-wake cycle and tend to get more sleep. This may be related to benefits in being more able to stabilise mood and the ability to deal with stress.

AG

COMT: A allele carriers are related to reduced efficiency of the COMT enzyme leading to higher levels of dopamine. Research has linked this to a tendency to be more sensitive to stress.

TT

MAOA: Research has shown T allele carriers may breakdown neurotransmitters quicker, leading to serotonin being removed quicker from the brain.

Burnout

TT

CLOCK: TT allele results show more ability to fall into an earlier sleep-wake cycle and tend to get more sleep. This may be related to benefits in being more able to stabilise mood and the ability to deal with sleep.

AG

COMT: A allele carriers are related to reduced efficiency of the COMT enzyme leading to higher levels of dopamine. Research has linked this to a tendency to be more sensitive to biological stressors including increased adrenal response.

TT

MAOA: Research has shown T allele carriers may breakdown neurotransmitters quicker, leading to serotonin being removed quicker from the brain.

Inflammation

AA

IL6R: Carriers of the A allele may have an increased immune response to an inflammatory diet and lifestyle. This may increase chronic inflammatory markers and risk of immune-mediated inflammatory disease such as chronic heart disease.

CT

MNSOD: Carriers of the C allele have increased activity of this cellular antioxidant enzyme. This leads to increased clearance of free radicals when the body is subjected to oxidative stressors such as high sugar diets, stress, alcohol and toxins in our environment.

AG

TNFALPHA: Carriers of the A allele have been associated with increased ability to produce tumour necrosis factor alpha and likelihood of chronic low-grade background inflammation.

Vitamin D

CT

VDRFOK: The T allele has poorer calcium absorption than the C allele. Ensure adequate calcium (in the form of Microcrystalline hydroxyapatite), magnesium and vitamin D3 and reduce caffeine to 300mg per day. T allele carriers are also more susceptible to insulin resistance when deficient in vitamin D.



VDRBQ: The T allele means a person does not readily absorb vitamin D from sun exposure. This may also contribute to seasonal depression, particularly when the sun is at its lowest in the Autumn/Winter season. Studies have noted a strong correlation between vitamin D deficiency and neurological degeneration.

Lactose



MCM6: The C allele can impact a person's ability to break down lactose, therefore increasing risk for lactose intolerance. Likelihood of digestive discomfort caused by lactose intolerance is increased. A dairy or lactose free diet may be recommended.

Caffeine



CYP1A2: AC allele is likely a slow metaboliser of caffeine.



Sleep - Moderate

Your Result

Your overall score indicates that you may be predisposed to experience poor sleep patterns. To determine the risk score, we have assessed your genetic variants (CLOCK) and sleep questionnaire results.

Your Genetic Variants



Clock

The TT genotype has shown to be more likely to have an earlier sleep-wake timing (morning) preference, associated with a tendency to start their activities early in the day.

The **Circadian Locomotor Output Cycles Kaput** (CLOCK) gene is a key part of our internal body clock. Our 24-hour natural circadian rhythms directly influence our sleep patterns. This includes the amount of sleep we get and our preferences for sleep-wake timings. Morning types or so-called larks, naturally prefer to wake earlier and tend to be more productive in morning, as opposed to evening types, often referred to as owls, who prefer to get things done later in the day and into the evening.



Lifestyle Interventions

What to do

Tips for better sleep

If you do start experiencing interrupted sleep patterns then you may find these tips helpful. What you eat, drink and do can have a huge impact on the quality and pattern of your sleep - and not just in the time before bed. Think of your sleep as just one component in your 24-hour cycle of wake and rest; to get the most out of it you need to control what you eat and drink and when.

The list of suggestions for better sleep is not meant to be implemented in its entirety. Instead pick three or four changes to implement to help improve your sleep quality.

Make sure you are not over-stimulated before bed

- Avoid alcohol (wine, beer, and hard liquor) within 3 hours of bedtime.
 - Avoid caffeine-containing beverages or foods after 2 pm; if sensitive to caffeine, avoid it after 12 noon.
- Read the labels of everything you eat and drink!

- Similarly, aerobic exercise can elevate your alertness for several hours, so you should ideally exercise before 6pm or at least 3 hours before bedtime.
- decongestant cold medicines at night.
- Some medications may have stimulating effects. Consult your pharmacist and doctor to determine whether any of them might be contributing to sleep problems. Do not discontinue them without permission from your doctor.

Sleep planning and preparation

- Plan your sleep by putting it into your schedule; plan for 8½ to 9 hours in bed.
- As much as possible, go to sleep and wake up at the same time each day. This will help train your biological clock.
- Begin prepping for bedtime 30 minutes before getting in bed.
- Avoid getting in bed after 11 pm as late-hour sleep is not as helpful as earlier sleep.
- Avoid late afternoon or evening naps.
- Avoid naps longer than 45 minutes unless you are sick or quite sleep deprived.
- Avoid large meals or spicy foods before bed.
- Finish all eating 3 hours prior to going to sleep. This allows your digestion to get underway and metabolism to return to baseline.

Relax the brain before bed time

- Have a wind-down routine before retiring for the night. Consider stretching, meditation, enjoy a face cleansing ritual before bed and write down any concerns or tasks for the next day on a piece of paper and leave it next to your bed.
- Try a hot salt/soda aromatherapy bath which can help raise your body temperature before sleep to induce sleep. A hot bath also relaxes muscles and reduces tension. For example, add 1-2 cups Epsom salts, ½ to 1 cup baking soda and 10 drops lavender oil.

Bright light / blue light

- Our internal body clock works best if it is reset in the morning by light exposure so get outdoors in the morning.
- Consider reading a good neutral book under low light to help with falling asleep.
- If using a tablet or phone for reading, make sure they are in the night-time setting and brightness is as low as possible. Research shows that the blue light from electronic screens including smart phones and televisions can confuse our natural biological clock leading to a reduction in sleep quantity and quality.

Sleep environment

- Consider where you sleep, including bed/bedding, light, noise and temperature.
- Turn down the light in the bathroom and in rooms you are in 15 minutes before going to bed.
- Decrease the light in your bedroom by using a dimmer or a reading light with a dimmer.

- Turn off or remove any appliances or clocks that make noise.
- Make sure your sleeping area is the correct temperature range (not too hot or too cold).

Bedding and pillows

- Consider replacing your pillows with hypoallergenic pillows. Use ultrafine allergy pillow and mattress covers.
- Sleep on the highest quality bed linens you can afford.

Tension and anxiety

- Avoid anxiety-provoking activities close to bedtime.
- Avoid watching the news before going to bed.
- Avoid reading stimulating, exciting materials in bed.
- Avoid paying bills before bed.
- Avoid checking your financial reports or the stock market before bedtime.
- Try to achieve some action plan or resolution of a discussion or argument before trying to go to sleep.
- Try writing in your journal any disturbing thoughts that are running through your mind.
- Schedule a time within the next few days to deal with whatever is troubling you. If you are having trouble managing your concerns for more than a few weeks, consult your healthcare or nutritional practitioner for treatment suggestions.
- There are many relaxing yoga or stress reducing mindful breathing Apps, CDs or DVDs available to help you find a relaxing bedtime ritual that works for you.

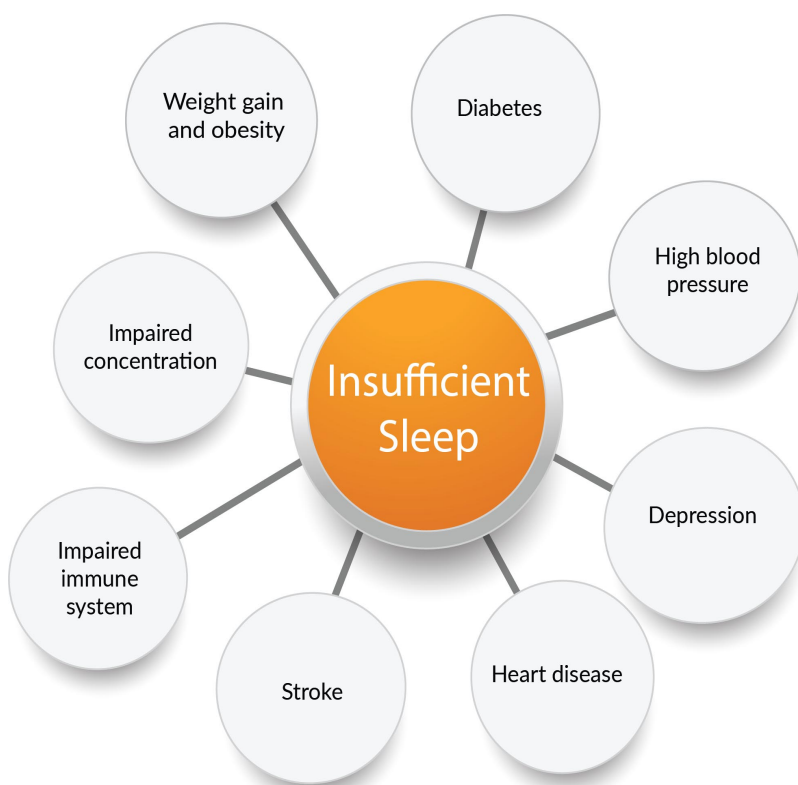
Always seek help from a healthcare or nutritional practitioner if sleep remains disrupted.

More Info

Health problems linked to insufficient sleep

Poor sleeping patterns could lead to major health issues such as obesity, heart disease, high blood pressure and diabetes. Sleep supports healing and detoxification and is an important factor in maintaining healthy hormones. When asleep, we "clear out" neurotransmitters and hormones in the brain to prevent brain fog, fatigue, low mood and anxiety.

The image below is an illustration of how insufficient sleep can impact your health and wellbeing.





Appetite Regulation - Moderate

Your Result

According to the genetic variants as well as the questionnaire you filled in, you have a moderate risk for food cravings which can put you at risk of excessive weight gain.

Your Genetic Variants



Clock

TT allele result shows no significant influence of this genetic variant on the likelihood of weight gain due to changes in appetite stimulation.

Regulation of our appetite is influenced by many factors and we are increasingly aware that our sleeping preferences play important roles in prompting us to eat. The **CLOCK** gene forms part of our genetic internal body clock and variations in this gene have been associated with altered metabolic function and appetite control.



FTO

Carriers of the A allele show some increased propensity for a higher BMI, higher body fat percentage due to an increased appetite particularly for saturated fat.

The **Fat Mass and Obesity Associated (FTO) Gene** has a genetic variant which has been consistently associated with appetite regulation, energy expenditure and risk of obesity. FTO is expressed in most tissues but highest levels are found in the hypothalamus, a key brain area involved in energy balance.

On a more positive note, lifestyle modification is effective in weight management and is not hindered by having this gene variant.



MC4R

TT allele shows no change in eating behaviours due to this variant.

Alpha-Melanocyte-stimulating hormone forms a crucial part of our satiety response in the brain by binding to the **melanocortin 4 receptor (MC4R)** to suppress appetite.



Craving
Questionnaire
Severe

Lifestyle Interventions

What you can do

Start by making some lifestyle changes. Get enough sleep, go for a run or brisk walk whenever you get the urge to reach for something sweet (or salty) – and these small, but important changes will help you become healthier and cravings-free.

Improve sleep and mood

Cravings may result from low mood or lack of sleep: it's our body's way to make up for the lack of energy and dopamine. Sleep also regulates the hunger and satiety hormones – ghrelin and leptin. In case of sleep deprivation, there is an abundance of the hunger hormone ghrelin and not enough of the satiety hormone leptin. Sleep also balances other hormones and not getting a good night's sleep can lead to high levels of cortisol – the stress hormone.

Not only that, but when we're sleep deprived, the CB1 receptor of the endocannabinoid system of the brain stimulates reward and addiction mechanisms – that's why that chocolate bar is even more dangerous when you're sleep deprived, it might drag you into a vicious circle.

See Sleep Report for more information.

Reduce stress

When we're stressed, we try to snack ourselves calm. Stress may also cause weight gain on its own, without extra food cravings. Stress results in higher levels of cortisol, the stress hormone, which may promote belly fat. See Stress Report for more information.

Exercise

Benefits of regular exercise are enormous. We often seek sugary treats to boost our mood, but exercise can do that too! Endorphins get released into our bodies after a workout, improving our mood, so we might not need that mood-boosting snack after all.

Eat filling foods

such as whole foods, protein-rich foods and foods containing healthy fats to stay full for longer and avoid the need to snack.

Stay hydrated

Too little water can promote hunger and cravings in some people. Hunger and thirst can produce very similar sensations in the mind, causing it to become confused. One of the easiest ways to reduce food cravings is to make sure the body is hydrated throughout the day. Drinking plenty of water helps clean out toxins from the body, which may also benefit a person's overall well-being.

Avoid feeling hungry

Under-eating can worsen food cravings by making us crave more calorie-dense foods than usual, such as fried

and processed foods. Don't wait for hunger to become too intense, instead, have a regular pattern of meals planned throughout the day.

Control portions

For some people, completely avoiding the food they crave may make these cravings worse. This can lead to overeating or feeling miserable without that food. In this case, it may be better to satisfy the cravings with a small, portion-controlled treat. It can help to put this treat at the end of a healthy habit, such as going for a walk or completing an exercise routine.



Saturated Fat Balance - Moderate

Your Result

Your score indicates that this is an area that needs dietary support in order to reduce risks associated with impaired saturated fat metabolism and/or changes in blood triglyceride levels. To determine the risk score, we have assessed your genetic variants including APOA2 and APOA5 alongside the dietary fat intake questionnaire to indicate if you may be over consuming some fats.

Your Genetic Variants



ApoA2

T allele carriers show no changes in Apolipoprotein A-II production and therefore there is no associated effect on saturated fat metabolism.

The **APOA2 gene** encodes Apolipoprotein A-II, a protein which is an important part of High-Density Lipoprotein (HDL) cholesterol (which is sometimes known as our 'good' cholesterol). A variant in this gene has been associated with reduced ability to produce Apolipoprotein A-II which has effects on saturated fat metabolism.



ApoA5

The AA genotype shows no associated changes with fasting blood triglyceride levels.

The **APOA5 gene** encodes the Apolipoprotein A5 which is part of our triglyceride (fat) metabolism. A variant in this gene has been associated with changes in blood triglyceride levels related to the diet we choose.



Lifestyle Interventions

What you can do

Consumption of fats, particularly saturated fat has historically been associated with poor cardiovascular outcomes and obesity. From this, earlier nutritional guidelines regarding dietary fat intake often included generic advice to consume a low-fat diet. However, current research and understanding has advanced to discover that not all fats are created equal and that you may process fats in slightly different ways according to your genetic

variations and dietary choices. Saturated fat can be recognised by their characteristic of being solid at room temperature. Examples include, animal fat such as beef, lamb, chicken, pork and dairy products, plus it is also present in some plant foods such as coconut, palm oil and peanuts.

When balancing your fat intake, it is important to look at all aspects of your diet. Research varies on its opinion as to the best amounts of fat to consume in the diet, but it is generally considered best to keep fat to 20%-35% of your recommended dietary intake unless there is some other specific requirement (such as for weight management, infants, during pregnancy and certain medical conditions – please consult your healthcare provider for further information).

Fat provides a lot of energy in a small volume and can be used by the body for different processes such as a source of energy but is also important for optimal functioning of the brain, connective tissue and gastrointestinal tract. It is best to keep your saturated intake to 8%-10% and to offset this by including daily sources of healthier unsaturated fats found in avocados, olives, nuts, seeds, oily fish and flaxseeds.

Top tips for balancing your total fat intake include:

- Reduce your consumption of meats and dairy produce and choose higher welfare or wild products where possible.
- Regularly include sources of omega 3 beneficial fats. This may be achieved by including oily fish in your diet, aim for a minimum of two portions per week or including flaxseeds such as a salad topper or in porridge.
- Eat olives and walnuts, consider using the oils of these as a salad dressing.

As our fat pathways are linked to our carbohydrate and protein pathways it is important to be mindful of other areas in your diet to ensure optimum fat metabolism. This includes:

- Balancing blood sugars by choosing low glycaemic index and lower sugar foods.
- Choosing foods higher in fibre such as vegetables, oats, barley, beans, lentils and nuts can help to balance blood sugars and aid the elimination of certain fats from the body.
- Including a wide range of phytonutrients and antioxidants found in coloured fruits and vegetables. Aim for a rainbow effect e.g. blueberries, yellow bell peppers, spinach, onions.

How to balance your fat intake

Our understanding of how we should be eating fats in our diet has moved on from simple low-fat guidance. We now understand the importance of paying attention to both quantity and quality of the fats we consume.

Tips for storage and cooking:

Due to their nature fats and oils (particularly unsaturated) are easily degraded by heat and light, becoming rancid and lose their benefits and actually become detrimental for our health.

Follow the following tips to keep your fat and oils in the best condition.

- Oils should be kept in dark glass containers at cool temperatures and used before their sell by date
- Never cook with fats at high temperatures. If you need to fry or roast use a small amount of a stable fat such as coconut oil or ghee at the lowest temperature possible.
- Do not fry or excessively heat monosaturated or polyunsaturated oils. Use these as salad dressings.
- Throw away any fat or oil if it smells rancid.



Cholesterol Insights - Typical

Your Result

Your score indicates you may be at lower risk of an unbalanced cholesterol lipoprotein profile. If you are at all concerned, contact your healthcare provider for further discussion.

To determine the score, we analysed your genetic variants including PPARG, GCKR, FABP2 and APOA5 alongside the dietary fat intake questionnaire.

Your Genetic Variants



ApoA5

AA allele is not associated with changes in cholesterol levels.

The **APOA5 gene** encodes the Apolipoprotein A5 which is part of our triglyceride (fat) metabolism. A variant in this gene has been associated with changes in cholesterol blood profiles.



FABp2

T allele carriers show a predisposition to higher LDL-cholesterol (which is sometimes known as our 'bad' cholesterol) and lowered HDL-cholesterol (which is sometimes known as our 'good' cholesterol) blood profiles.

FABP2 gene produces a small protein predominantly found in the intestinal epithelial cells, fatty acid binding protein 2. This protein is important for uptake of fatty acids from the gastrointestinal tract. A variant of this gene has been found to alter the protein structure and increase fat sensitivity, modifying cholesterol blood profiles.

Research shows that it may be beneficial to moderate saturated fat intake and increase omega 3 intake.



GCKRa

CC allele is not associated with changes in blood triglycerides or cholesterol.

Glucokinase is a key enzyme involved in regulating how the liver either stores glucose as glycogen or uses glucose for energy. **GCKR** is a gene which produces an important regulatory protein for this pathway, helping to control the fate of glucose. Because the way in which we use glucose also influences our blood triglyceride and cholesterol levels a variant of the



Cholesterol
Lowering
Questionnaire
Typical



GCKR gene has been associated with changes in triglyceride and cholesterol levels.



PPAR γ

CG carriers of the G variant have been associated with higher LCL Cholesterol levels, particularly in obese individuals who consume higher levels of saturated fat and lower levels of omega 3's. Research has associated omega 3 dietary supplementation with improvements in LDL-cholesterol.

PPARG gene encodes a transcription factor (peroxisome proliferator-activated receptor gamma), a type of protein able to enter a cell nucleus and bind to DNA to regulate expression of genes. PPARG is a regulator of metabolism of fats (breakdown and storage) from our adipose tissue. A genetic variant in this gene has been associated with reductions in ability to activate gene expression and associated with changes in cholesterol levels.

Lifestyle Interventions

What to do

You are at lower risk. However, if you are concerned and want to prevent developing an unbalanced cholesterol lipoprotein profile in the future, then consider the below diet and lifestyle interventions.

Top tips for balancing your cholesterol profile include:

Reduce processed (particularly fried) foods and saturated fat consumption See the saturated fat decision tree for further information.

Exercise regularly: aim for at least 150 minutes of moderate aerobic activity such as cycling or brisk walking every week; or 75 minutes of more vigorous exercise such as running or a game of singles tennis every week; or a mix of moderate and vigorous aerobic activity every week – for example, two 30-minute runs plus 30 minutes of brisk walking equates to 150 minutes of moderate aerobic activity.

Add soluble dietary fibre to your diet - To help the removal of excess cholesterol include regular soluble dietary fibre sources such as oats and legumes.

Regularly include sources of omega 3 beneficial fats. This may be achieved by including oily fish in your diet, aim for a minimum of two portions per week or including flaxseeds such as a salad topper or in porridge.

Eat a daily rainbow vegetables and fruits. We are increasingly understanding that the colours of fruits and vegetables contain natural compounds called phytonutrients which can have powerful health benefits. Balance cholesterol profiles have been associated with consuming a diet rich in fruit and vegetables, particularly of a variety of colours. Certain phytonutrients have been particularly associated with helping to reduce risks associated with LDL cholesterol.

Aim to include the following as part of your rainbow of plant foods:

- **Lycopene:** is a red-coloured pigment found in foods such as tomatoes, tomato-based products and red watermelon.
- **Phytosterols:** are found in many plant foods but in useful concentrations in nuts (and their oils), olive oil, seeds, whole grains and legumes.
- **Quercetin:** is a strong anti-oxidant found in red onions, buckwheat, red grapes, green tea and apple skins.
- **Resveratrol:** is found in red grapes and becomes highly concentrated in red wine (remember alcohol should be consumed in moderation) but is also found in blueberries and peanuts.

Find out what cholesterol is and why we need it.

What is cholesterol?

Cholesterol is a fatty substance which is made in the liver. It's found in some foods too. We all need some cholesterol in our bodies just to keep us ticking over but having too much can clog up our arteries and lead to health problems in the future.

As cholesterol is a type of fat, it is not soluble in the body and must be transported as part of a specialised system used to move fats through the water-based blood.

The carrier systems of fats are called lipoproteins which you may have heard of as; low-density lipoprotein cholesterol (LDL-cholesterol) or high-density lipoprotein cholesterol (HDL-cholesterol).

- **LDL** delivers cholesterol to cells throughout the body and is also sometimes called 'bad' cholesterol as it has been linked to cardiovascular disease.
- **HDL** delivers excess cholesterol back from the body's cells to the liver for excretion and has been associated with a reduced risk of cardiovascular disease, hence 'good' cholesterol.

Increased levels of circulating LDL-cholesterol have historically been linked to consuming foods which contain higher levels of cholesterol and advice was given to reduce these in the diet. However, most of the cholesterol in our body is actually produced by the liver and as little as 10% of the cholesterol in the blood comes directly from the foods we consume. Our transport and metabolism of cholesterol is tightly regulated and current research understands it is influenced by both our individual genetics plus our diet and lifestyle factors.

Why do we need cholesterol?

Cholesterol plays a vital role in how our body works and there is cholesterol in every cell in our body, and it's especially important in our brain, nerves and skin.

Cholesterol has three main jobs:

- It's part of the outer layer, or membrane, of all our body's cells
- It's used to make vitamin D and steroid hormones which keep our bones, teeth and muscles healthy.
- It's used to make bile, which helps to digest the fats you eat.



Omega 3/6 Imbalance - Elevated

Your Result

Your overall score indicates a risk for essential fatty acid imbalance due to increased or decreased enzyme function responsible for omega-3 (FADS1) and omega-6 (FADS2) metabolism in the body. To determine the score we analysed your genetic variants alongside the dietary fat intake questionnaire and essential fatty acids deficiency checker questionnaire.

Your Genetic Variants



FADS1

CC allele is associated with a functioning D5D enzyme responsible for omega-3 metabolism.

FADS1 gene encodes for the delta-5-desaturase (D5D) enzyme responsible for omega-3 metabolism. A genetic variant is associated with a reduced D5D enzyme activity which indicates an impaired omega-3 pathway. Research has indicated that reduced D5D activity is related to inflammatory states such as obesity and insulin resistance and thus the variants contribute to this risk.



FADS2

TT allele indicates an increased D6D enzyme activity which may impact downstream production of certain omega 6 fats leading to heightened inflammatory state. Carriers may consider reducing omega-6 dietary sources.

FADS2 gene encodes for the D6D activity in omega-6 enzyme. Increased D6D enzyme activity has been correlated to inflammatory states and a decreased need for omega 6.



Essential Fatty
Acids Deficiency
Questionnaire

Moderate



Omega 3/6 Balance
Questionnaire

Severe

Lifestyle Interventions

What to do

The ratio of omega-3 fatty acids to omega-6 fatty acids is important to balance. This is due to the fact that

omega-6 fatty acids help generate pro-inflammatory chemicals. While these can aid the immune system to an extent, far too many of them can lead to chronic inflammation, which can in turn increase a person's susceptibility to disease. On the flip side, omega-3 fatty acids help to generate anti-inflammatory chemicals which can help to dampen chronic inflammatory messages.

- Reduce intake of omega 6 fats such as grain fed or non-free-range chicken and other meats and processed commercial fats.
- Ensure adequate intake of omega 3 fats such as non-farmed wild caught oily fish, green leafy vegetables, nuts, flax and chia seeds, and walnut oils.

More Information

Polyunsaturated fats are fatty acids known as PUFAs. Two well-known PUFAs are omega-3 and omega-6 fatty acids. Both omega-3 and omega-6 fatty acids are considered to be "essential fats" because the human body is unable to produce them naturally and they are essential for certain body processes.

The main types of omega 3 fatty acids are alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA), and all have different but important effects on overall health. While the main function of EPA is to help reduce inflammation, DHA is crucial for normal brain function and development. ALA is primarily used for conversion into EPA and DHA.

ALA is normally found in fats from plant foods, such as nuts and seeds (walnuts and rapeseed are rich sources). EPA and DHA, collectively called long chain omega 3 fats, are naturally found in fatty fish, such as salmon and fish oils including cod liver oil. Omega 3 fats are also readily available in supplements.

Gamma-linolenic acid (GLA), on the other hand, is an omega-6 fatty acid that's necessary for maintaining brain function and can induce a weak anti-inflammatory effect. Good sources include certain oils like evening primrose oil and borage oil.



Blood Sugar Imbalance - Moderate

Your Result

Your overall score indicates this is an area that needs dietary and lifestyle support to provide future protection against developing blood sugar dysregulation conditions such as hyperglycaemia and insulin resistance.

To determine the risk score, we have assessed your genetic variants including ADIPOQ, GCKR, PPARG and TCF7L2 alongside the blood sugar sensitivity questionnaire to indicate if you may be symptomatic.

Your Genetic Variants



ADIPOQ

CC allele shows no association with increased risk of insulin resistance.

Our fat storage (known as adipose tissue) also functions to release important hormone signals to the body. Adiponectin is one such hormone and one of its roles is making sure our tissues are sensitive to insulin. This allows muscles to burn fatty acids and to take up glucose from the bloodstream. A genetic variant of the **adiponectin coding gene ADIPOQ** has been associated with changes in this mechanism leading to insulin resistance.



GCKR

You are more predisposed to higher fasting blood glucose and insulin levels. You may benefit from increasing consumption of whole-grains and removal of refined sugars from your diet.

Glucokinase is a key enzyme involved in regulating how the liver either stores glucose as glycogen or uses glucose for energy. **GCKR** is a gene which produces an important regulatory protein for this pathway, helping to control the fate of glucose. A variant of the GCKR gene has been associated with changes in blood glucose and associated insulin levels.



PPARG

Carriers of the G variant have been associated with improved insulin sensitivity and being at reduced risk of developing type 2 diabetes. This beneficial effect is thought to be removed in overweight individuals.



Blood Sugar
Sensitivity
Questionnaire
Moderate



PPARG gene encodes a transcription factor (peroxisome proliferator-activated receptor gamma), a type of protein able to enter a cell nucleus and bind to DNA to regulate expression of genes. PPARG is a regulator metabolism of glucose.



TCF7L2

CT allele is associated with a moderate propensity towards insulin resistance. Carriers may benefit from consuming a diet lower in refined carbohydrates and higher in fibre.

TCF7L2 gene encodes a transcription factor (7-like 2), a type of protein able to enter a cell nucleus and bind to DNA to regulate expression of genes. TCF7L2 has many different roles in particular as a regulator of genes which affect insulin secretion. A genetic variant in this gene has been associated with changes in this proteins structure and its ability to regulate insulin sensitivity.

Lifestyle Interventions

What to do?

It is important to maintain an even blood sugar level. The more often blood sugar rises, the more insulin is produced and as more is produced, more sugar is turned into fat. Over time, the body's cells become less responsive (or resistant) to insulin, causing even more insulin to be produced which can lead to type 2 diabetes.

In addition to excessive sugar consumption, there are other factors that contribute to the development of insulin resistance and type 2 diabetes including too much highly processed food, physical inactivity and low muscle mass, sleep deprivation, persistently high stress levels, disturbed gut bug ecosystem and low levels of vitamin D.

Goal setting and making slow changes can help set yourself up for success.

How do you know if you have prediabetes?

The results from a fasting plasma glucose or an HbA1c blood test can indicate if you are at risk. The following results indicate the presence of prediabetes:

- Fasting plasma glucose level of 5.5 to 6.9 mmol/L or an
- HbA1c level of 42 to 47 mmol/mol (6.0 to 6.4%)

Lower and your blood glucose levels are normal. If your results are above the upper limits for prediabetes, your GP may either diagnose you with type 2 diabetes or take another test in the near future to confirm whether you have diabetes.

Tip: Goal setting and making slow changes can help set yourself up for success.

Understanding blood glucose levels and prediabetes

The first step to reducing risk of blood sugar imbalance is to understand what makes blood sugar levels rise.

- **Glucose:** The carbohydrates and sugars in the food eaten turns into glucose (sugar) in the stomach and digestive system. Glucose can then enter the blood stream.
- **Insulin:** Insulin is a hormone that is made in the pancreas and helps the body's cells take up glucose from the blood and lower blood sugar levels.
- **Prediabetes:** If your doctor has told you that you have prediabetes this means your blood glucose levels are higher than normal, not high enough for you to be diagnosed with type 2 diabetes. It does mean you have a higher chance of developing type 2 diabetes.
- **Type 2 diabetes:** In type 2 diabetes glucose builds up in the blood instead of going to cells because,
 - The body develops "insulin resistance" and can't use the insulin it makes efficiently.
 - The pancreas gradually loses its capacity to produce insulin.
 - The result can be a higher blood glucose level.

Eat better

- Limit sugary foods and beverages. According to the World Health Organization, an average adult should consume only 10 per cent of their energy intake in the form of free sugars, or about 12 teaspoons per day.
- Follow UK guidelines to consume foods containing less than 5 per cent sugars using food labelling.
- Try to choose foods with a low glycaemic load as these slow the release of sugars into the blood stream.
- Fiber helps to slow the rate at which glucose enters the bloodstream, which can help to achieve good blood sugar control. Carbohydrates rich in fiber include **fruits, vegetables**, legumes (beans), and whole grains.

Get active

- If you spend long periods of time sitting, (this does not include sleeping) this is known as a 'sedentary' lifestyle. Being sedentary is associated with an increased risk of type 2 diabetes.
- Physical activity can help control and reduce type 2 diabetes health effects.

Maintain a healthy weight

You're more at risk of type 2 diabetes if you're overweight, especially if you're large around the middle. (Source: Diabetes UK)

Not all carbohydrates are the same

Sugar and carbohydrates are our most basic source of energy and are essential to life. However, we managed to "hack" nature by extracting pure sugars and adding them to foods, by refining carbohydrates and by heavily processing foods. Eating excessive sugars and carbohydrates is the main reason why we put on weight.

Not all carbohydrates are the same. Simple carbohydrates are broken down quickly by the body and are in foods like sugar, white bread and pastas, whereas complex carbohydrates - the ones mother nature intended us to use to fuel our bodies - such as brown rice or quinoa, are broken down into glucose more slowly. When glucose is released slowly, our blood sugar levels remain more or less stable and we feel energised for longer. When glucose is released too quickly it disrupts the body's blood sugar levels, which can then be harmful to your health over the long term, and dramatically affect your ability to manage weight effectively.

Using glucose too quickly for energy is also what causes energy dips (also called "sugar crashes"). The more often blood sugar rises, the more insulin is produced and as more is produced, more sugar is turned into fat. Over time, the body's cells might become less responsive (or resistant) to insulin, causing even more insulin to be produced which can lead to diabetes.

How well sugar is absorbed and stored also partly depends on genetics. Some people will pull too much sugar from the carbohydrates that they eat or they may direct too much of the sugar in the blood into fat storage. Both problems might, in the long run, lead to weight gain, or type 2 diabetes. These health issues are preventable by being mindful of food and lifestyle choices.



Inflammation - Elevated

Your Result

You have the genetic predisposition for inflammation, and according to your inflammation questionnaire result, you may be experiencing symptoms of inflammation. The overall score suggests you may be more prone to inflammation. To determine the risk score, we have assessed your genetic variants including IL6 Receptor (cytokine), TNF alpha (cytokine involved in systemic inflammation), MnSOD and questionnaire results.

Your Genetic Variants



IL6R

Carriers of the A allele may have an increased immune response to an inflammatory diet and lifestyle. This may increase chronic inflammatory markers and risk of immune-mediated inflammatory disease such as chronic heart disease.

Research suggests making lifestyle change to reduce the inflammatory component of diet such as high sugar intake and including sources of plant sterols (found in many vegetables, fruits, legumes, nuts and seeds) as important with this genetic variation.

IL6R gene encodes the receptor for interleukin 6, a cytokine signalling molecule which has important roles in regulation of our immune-mediated inflammatory response. A variant in this gene has been associated with a change in the biological activity of IL6 leading to changes in our chronic inflammatory response.



MnSOD

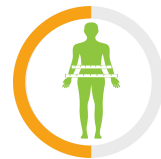
Carriers of the C allele have increased activity of this cellular antioxidant enzyme. This leads to increased clearance of free radicals when the body is subjected to oxidative stressors such as high sugar diets, stress, alcohol and toxins in our environment.

MnSOD gene encodes manganese superoxide dismutase, an important antioxidant enzyme. This enzyme is an important first step in a pathway to remove free radicals produced as a natural by-product of energy production pathways found in the majority of cells in the body. Free radicals can cause damage to cellular structures and processes so it is important to have effective mechanisms to remove these. A variant of this



Inflammation
Questionnaire

Severe



Waist/Hip Ratio

Moderate



gene has been associated with a change in the structure of this enzyme and its efficiency.

Due to the increased activity of this first free radical removing step, research has established a detrimental effect due a build-up of a secondary by-product known as peroxide. Peroxide may also cause damage to the cell and is usually cleared by antioxidants from our diet in a secondary reaction. However, if there is not a plentiful supply to keep up with its production this may lead to increased oxidative stress and low-grade inflammation. It is important for those carrying this variation to consume an antioxidant rich diet.

AG

TNFalpha

Carriers of the A allele have been associated with increased ability to produce tumour necrosis factor alpha and likelihood of chronic low-grade background inflammation.

TNF alpha gene encodes an inflammatory immune cytokine messenger, tumour necrosis factor alpha. Amongst its different roles tumour necrosis factor alpha is released from white blood cells (known as macrophages) in response to inflammatory signals which increase the immune inflammatory response. A genetic variant of this gene has been shown to increase the amount of tumour necrosis factor alpha and likelihood of chronic low-grade background inflammation.

Evidence suggests that maintaining an anti-inflammatory based diet, particularly a high omega 3 to saturated fat ratio may be beneficial to reducing tumour necrosis factor alpha production.

Lifestyle Interventions

What to do?

To control inflammation, limit inflammatory stressors and load up on supporting foods and lifestyle habits! You should pay special attention to the foods that can both promote inflammation as well as those that can be anti-inflammatory.

- **Include enough omega-3 fats** from oily fish (such as non-farmed, wild salmon, mackerel, herring, trout, tuna and sardines), flax and chia seeds.

Also try to **include some anti-inflammatory foods** such as olive oil, avocados, green leafy vegetables and nuts.

- **Try to avoid or limit foods that inflame as much as possible:** shop-bought processed products, fried

foods, sugar, refined carbohydrates, peanuts, processed meats and potential allergies or irritating substances such as alcohol. Reduce intake of omega 6 fats such as grain fed or non-free-range chicken and other meats and processed commercial fats.

- **Get plenty of antioxidants** from fresh fruits and vegetables. Try to eat a rainbow of colours daily.
- **Manage stress and negative thoughts.** Research shows that people who ruminate (think about negative things in the past) tend to have a prolonged inflammatory response. Find some way to manage psychological and emotional stress so it isn't preying on your mind. See your Stress report for more information.
- **Sleep well,** 7-8 hours preferably. Sleep affects the expression of many genes that regulate our immune system. Lack of sleep can upregulate ("turn on") the pro inflammatory genes that can contribute to inflammation. See your Sleep report for more information.
- **Get moving.** Even a 30 minute brisk walk every day can reduce inflammation and downregulate ("turn off") the genes responsible for inflammation. Therefore, exercise is encouraged. However, make sure that it's the right kind of exercise for you and that you are not over-exercising as this can contribute to inflammation. Start slow and build up the intensity and frequency as you grow stronger and symptoms of inflammation subside.
- **Take care of your gut flora.** Inflammation can negatively affect gut flora and vice versa. Take care of your gut to stop or prevent this vicious cycle.
- **Lose some weight.** If you are overweight, try to gradually shed some pounds - fat cells churn out inflammatory proteins called cytokines.
- **Consider supplementation** if you're doing all of the above and still experiencing symptoms of inflammation. There are plenty of natural supplements out there, such as turmeric and curcumin, that can help relieve inflammation. Check with myDNAhealth customer support or your nutritional or healthcare practitioner on the right kind of supplement for your symptoms.
- If you're still feeling inflamed, **check for allergies or intolerances** that may possibly be causing or prolonging your inflammatory response. Ask your nutritional or healthcare practitioner on how to get tested.

Functional test to consider: Organic Acid Testing

More Information

How does it work?

Inflammation is a natural and mostly beneficial process by which our body responds to a pathogen, toxin, stress or trauma. When something stresses your body, it responds by swelling in an attempt to heal itself. Inflammation is necessary for proper tissue repair; however, systemic or chronic inflammation has a domino effect that can seriously undermine your health.

Symptoms of chronic inflammation can be persistent pain, low energy, frequent headaches, recurring allergies,

high blood pressure and brain fog.

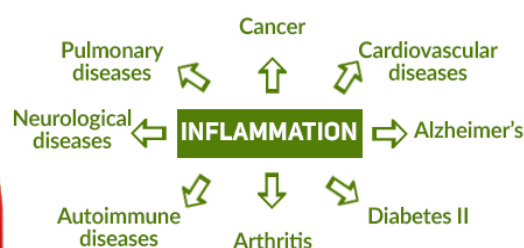
Inflammation also has a genetic component as certain genetic variants including IL6R, TNFa, MnSOD and the FADS, might make people more prone to inflammation. It is not an issue if those people are aware of their genetic predisposition and manage it through their lifestyle and diet.

A tendency for the body to overreact is also associated with a deficiency in essential fatty acids and their supportive nutrients, vitamins B3 and B6, biotin, vitamin C, zinc and magnesium. Vitamin B5 is also needed to make cortisol, the body's anti-inflammatory hormone.

What is systemic or chronic inflammation?

Long term chronic inflammation is a significant component of many health issues and a common denominator in the progression of many diseases such as diabetes, heart disease, autoimmunity and Alzheimer's. Unhealthy inflammation arises when our immune system's response goes out of control and doesn't "switch off", damaging our own healthy tissues.

When you catch a cold or sprain your ankle, your immune system switches into gear. Infection or injury trigger a chain of events called the inflammatory cascade. The familiar signs of normal inflammation such as heat, pain, redness, and swelling are the first signals that your immune system is being called into action. This is called acute inflammation.



Acute inflammation isn't a problem. If the inflammatory response flares up and then dies down, there's nothing to worry about - it signifies a well-balanced immune system. But symptoms of inflammation that don't recede are telling you that the "on" switch to your immune system is stuck. In some cases, what started as a healthy mechanism, like building scar tissue or swelling, just won't shut off - you may be exposed to something that your immune system keeps reacting to and there are not enough anti inflammatory substances in your body to stop that. This is called chronic inflammation.

It is also sometimes referred to as "hidden" inflammation as most people don't even know they're inflamed. It may sound relatively harmless, but this situation can lead to numerous health issues. If your immune system becomes overburdened, these inflammatory triggers are cycled continuously through your blood where they affect nerves, organs, connective tissues, joints, and muscles. This is how disease develops.



Stress - Moderate

Your Result

According to the genetic variants you may be more sensitive to stress and your stress questionnaire results indicate that you are experiencing levels of stress. Life stressors are among the risk factors for depression and increasingly research is evidencing links to upregulation of the key areas of the immune system involved in inflammation.

Your Genetic Variants



CLOCK

TT allele results show more ability to fall into an earlier sleep-wake cycle and tend to get more sleep. This may be related to benefits in being more able to stabilise mood and the ability to deal with stress.

Our biological clock genetically regulates day and night fluctuations of various physiological processes such as sleep-wake cycles. Research has established that variations in the **CLOCK gene** influence our sleep and is involved in mood regulation particularly in response to stress.



COMT

A allele carriers are related to reduced efficiency of the COMT enzyme leading to higher levels of dopamine. Research has linked this to a tendency to be more sensitive to stress.

Catechol-O-methyltransferase (COMT) is an enzyme which degrades some neurotransmitters involved in our stress response such as dopamine. A genetic variant in this gene has been associated with reduced activity of this enzyme leading to higher levels of dopamine.



MAOA

Research has shown T allele carriers may breakdown neurotransmitters quicker, leading to serotonin being removed quicker from the brain.

MAO-A gene encodes an enzyme involved in breakdown of certain neurotransmitters such as serotonin (sometimes called the happy chemical). The balance of such neurotransmitters as serotonin are important for the regulation of emotional behaviours. A genetic variant of this gene has been associated with increased activity of the MAO-A enzyme. As MAO-A is an X-chromosome linked gene, females will have



two copies compared to males who have one copy.

Lifestyle Interventions

Tips to manage your stress

Ensure that you are managing stress. If you're stressed, whether by your job or by something more personal, the first step to feeling better is to identify the cause. Below are some tips to help you destress. However, if you are struggling to cope and feeling overwhelmed then please consult with your nutritional or healthcare practitioner for additional support and guidance.

Get active: Exercise won't make your stress disappear, but it will reduce some of the emotional intensity that you may be experiencing, clearing your thoughts and helping you to deal with the problem more calmly.

Have some "me" time: Set aside some time for socialising, relaxation or exercise.

Avoid unhealthy habits: Don't rely on alcohol, smoking and caffeine as your ways of coping. You need to tackle the cause of your stress.

Work smarter: Working smarter means prioritising your work, concentrating on the tasks that will make a real difference. This means leaving the least important tasks to last.

Meditate: Try to meditate a few minutes each day to help ease anxiety.

Breathing techniques: Take a 5-minute break and focus on your breathing.

Look after your gut: Stress also impacts on digestion so a digestive enzyme may also be helpful during stressful periods.

More Information

How stress impacts your health

Stress is a normal physical response to events that make you feel threatened or upset your balance in some way. When you sense danger, whether it is real or imagined, the body's defences kick into high gear in a rapid automatic process known as the fight or flight reaction, or the stress response. The stress response helps you rise to meet challenges.

However, beyond a certain point, stress stops being helpful and starts causing major damage to your health, mood, productivity, relationships, and quality of life.

What happens when you experience stress?

When your body senses danger the adrenal glands release adrenaline and cortisol – hormones that provide you with the extra energy and strength required for either fight or flight. Ongoing stress means the cortisol levels are constantly elevated. Consequently, the adrenals produce too much cortisol and the effects of chronic overexposure to cortisol can be devastating.

Some consequences of prolonged cortisol elevations are abnormal blood sugar levels, loss of muscle mass and increase fat accumulation, especially in the stomach area and around the internal organs (which is known as visceral fat). For example, when the cortisol is unbalanced, sleep patterns can also be affected. Excess cortisol keeps us awake which leads to further excess cortisol secretion the next day resulting in food cravings, and

consequent weight gain. This is a vicious stress cycle.

How does stress affect your digestion?

Stress also impacts digestion and the gut may need additional support in the form of a digestive enzyme. Good stomach acid is also required to stimulate absorption of essential vitamins and minerals. Stress switches off stomach acid due to the fight or flight reaction!



Burnout - Elevated

Your Result

According to the genetic variants you may be more sensitive to burnout and your questionnaire result also indicates that you are experiencing levels of burnout due to prolonged stress. Burnout can affect well-being and quality of life in various ways. This can lead to poor physical and mental health, as well as a sense of isolation from other people.

Your Genetic Variants



CLOCK

TT allele results show more ability to fall into an earlier sleep-wake cycle and tend to get more sleep. This may be related to benefits in being more able to stabilise mood and the ability to deal with sleep.

Our biological clock genetically regulates day and night fluctuations of various physiological processes such as sleep-wake cycles. Research has established that variations in the CLOCK gene influence our sleep and is involved in mood regulation particularly in response to stress.



COMT

A allele carriers are related to reduced efficiency of the COMT enzyme leading to higher levels of dopamine. Research has linked this to a tendency to be more sensitive to biological stressors including increased adrenal response.

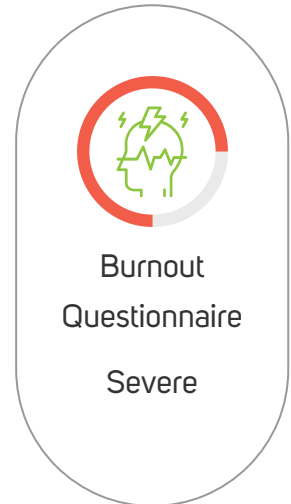
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this gene has been associated with increased activity of the MAO-A enzyme. As MAO-A is an X-chromosome linked gene, females will have two copies compared to males who have one copy.

Lifestyle Interventions

What to do?

In order to manage burnout and eventually overcome it, the first step is recognising that you are experiencing it.

Being under constant pressure to achieve, with few opportunities to take real breaks from work, can add to your levels of stress. This can make you feel overwhelmed and more likely to reach the burnout stage. For example, too intense a workload, paired with a toxic work environment and other sources of stress, can lead to burnout. But aside from an overwhelming workload, other factors can also contribute to stress levels and lead to burnout.

There are things you can do to support your adrenals and recover from the symptoms of burnout that you may be feeling.

- **Share your experiences with others.** One way of getting to the root of the problem is by sharing your experiences with someone. Try speaking to a friend, colleague or family member.
- **Get at least 8 hours of sleep every night,** keep to a regular schedule and rest when you're tired (see Sleep section for more information on sleep hygiene).
- **Manage stress** to keep the stress levels in the healthy range (see Stress section for more information).
- **Limit caffeine** intake to avoid overstimulating your adrenals.
- **Limit sugar and refined carbohydrates** in your diet.
- **Ensure enough nutrient-dense foods** in your diet - especially in the morning - such as coconut, avocado, oily fish, nuts and seeds. They will give you energy and beat your cravings for salty or sugary foods without raising your blood sugar levels.
- **Avoid environmental toxins.**
- **Eat regularly** and at about the same times every day.
- **Stay hydrated.**
- **Exercise.** Exercise can help support the adrenal function and also help to reduce stress and cravings. However, too much exercise can contribute to symptoms of adrenal fatigue - listen to your body.
- If you are following the above guidelines and still experiencing symptoms, **consider supplementing with adaptogenic herbs**, such as ashwaganda, ginseng, licorice root, holy basil. Consult your nutritional or healthcare practitioner before taking supplements.

The difference between stress and burnout

Burnout is a state of emotional, mental, and physical exhaustion caused by excessive and prolonged stress. It occurs when you feel overwhelmed, emotionally drained, and unable to meet constant demands. As the stress continues, you begin to lose the interest or motivation that led you to take on a certain role in the first place.

Burnout reduces productivity and saps your energy, leaving you feeling increasingly helpless, hopeless, cynical,

and resentful. Eventually, you may feel like you have nothing more to give.

Burnout is a gradual process. The signs and symptoms are subtle at first, but they get worse as time goes on. Think of the early symptoms as red flags that something is wrong that needs to be addressed. If you pay attention and act to reduce your stress, you can prevent a major breakdown. If you ignore them, you'll eventually burn out.

Burnout may be the result of unrelenting stress, but it isn't the same as too much stress. Stress, by and large, involves too much: too many pressures that demand too much of you physically and psychologically. Stressed people can still imagine, though, that if they can just get everything under control, they'll feel better.

Burnout, on the other hand, is about not enough. Being burned out means feeling empty, devoid of motivation, and beyond caring. People experiencing burnout often don't see any hope of positive change in their situations. If excessive stress is like drowning in responsibilities, burnout is being all dried up. And while you're usually aware of being under a lot of stress, you don't always notice burnout when it happens.



Caffeine Sensitivity - Moderate

Your Result

You are a slow metaboliser of caffeine and should limit your caffeinated drinks. Excessive consumption of caffeine can increase your risk of cardiovascular problems such as hypertension.

Your Genetic Variant



CYP1A2

AC allele is likely a slow metaboliser of caffeine.

The CYP1A2 gene contains instructions for an enzyme that breaks down the caffeine you consume.

Lifestyle Interventions

What you can do

- **Limit or reduce caffeine:** If you consume caffeine, current guidelines recommend that healthy adults drink no more than 400mg of caffeine a day. If you consume caffeinated coffee, research indicates you should stick to 2 cups or less a day to reap the best health benefits. But keep in mind that the actual caffeine content in beverages varies widely, especially among energy drinks. If you consume coffee, research indicates you should stick to 2 caffeinated cups or less a day to reap the best health benefits of the antioxidant compounds naturally present in coffee beans.
- **Avoid caffeine after 12pm.** Since caffeine hangs around in your system for several hours, consider avoiding caffeine starting mid-afternoon or earlier if you want a good night's sleep. If you fancy a warm drink in the afternoon or evening, try switching to caffeine free or herbal teas.

Caffeine guide

This is how much caffeine is in a cup (250ml) of black coffee, latte, energy drink, black tea, green tea and cola:

Latte: 113-280mg

Instant coffee with one teaspoon: 60-70mg

Black tea: 30-50mg

Green tea: 30-50mg

Energy drink: 80mg

Cola: 36-48mg

More Information

How does caffeine keep you awake?

Caffeine interferes with the brain system that causes sleepiness. A molecule called adenosine acts as a signal between brain cells to bring on sleepiness. Caffeine blocks adenosine's signals, making you feel more alert. This is why caffeine can make it hard to fall asleep and can interfere with deep sleep.



Lactose Intolerance - Moderate

Your Result

You have the genetic variants that may predispose you to being lactose intolerant. Lactose intolerance is a digestive problem that begins in the small bowel. Lactose is a natural sugar found in milk and other dairy products. If symptomatic you may benefit from limiting or removing dairy from the diet.

Your Genetic Variant



MCM6

The C allele can impact a person's ability to break down lactose, therefore increasing risk for lactose intolerance. Likelihood of digestive discomfort caused by lactose intolerance is increased. A dairy or lactose free diet may be recommended.

MCM6 is part of the MCM complex that helps to regulate the activity (expression) of the **LCT gene**, which encodes for the lactase enzyme. This enzyme helps to digest lactose, a sugar found in milk and other dairy products.

Lifestyle Interventions

What you can do

If you think you have lactose intolerance, you can try avoiding foods and drinks containing lactose for two weeks to see if your symptoms improve.

Symptoms of lactose intolerance usually develop within a few hours of consuming food or drink that contains lactose. They may include:

- flatulence (wind)
- diarrhoea
- bloated stomach
- stomach cramps and pains
- stomach rumbling
- feeling sick

The severity of the symptoms and when they appear depends on the amount of lactose you consume. Some people may still be able to drink a small glass of milk without triggering any symptoms, while others may not

even be able to have milk in their tea or coffee.

More Information

What causes lactose intolerance?

The body digests lactose using an enzyme called lactase. This breaks down lactose into two sugars called glucose and galactose, which can be easily absorbed into the bloodstream.

People with lactose intolerance don't produce enough lactase due to genetics or ageing when they may lose the ability to make this enzyme, so lactose stays in the digestive system where it's fermented by bacteria. This leads to the production of various gases, which cause the symptoms associated with lactose intolerance.

Depending on the underlying reason why the body isn't producing enough lactase, lactose intolerance may be temporary or permanent. Most cases that develop in adults are inherited and tend to be lifelong.



Risk for Vitamin D Deficiency - Elevated

Your Result

You have genetic variants which may predispose you to a vitamin D deficiency. In addition to bone health, emerging evidence from clinical studies has indicated that vitamin D deficiency is associated with several inflammatory diseases. Please discuss getting your vitamin D levels checked with your nutritional or healthcare practitioner.

Your Genetic Variants



VDRfok

The T allele has poorer calcium absorption than the C allele. Ensure adequate calcium (in the form of Microcrystalline hydroxyapatite), magnesium and vitamin D3 and reduce caffeine to 300mg per day. T allele carriers are also more susceptible to insulin resistance when deficient in vitamin D. The VDR gene produces the vitamin D receptor protein, responsible for binding vitamin D.



VDRtaq

The T allele means a person does not readily absorb vitamin D from sun exposure. This may also contribute to seasonal depression, particularly when the sun is at its lowest in the Autumn/Winter season. Studies have noted a strong correlation between vitamin D deficiency and neurological degeneration. The VDR gene provides instructions for making a protein called vitamin D receptor, which allows the body to respond appropriately to vitamin D. VDR proteins are found in the brain and stimulates the enzymes that generate dopamine. Low vitamin D is related to a number of neurological and immunological conditions. Studies show a relationship between Type 2 diabetes mellitus and vitamin D deficiency. Vitamin D deficiency can be seen in diseases such as Cardio metabolic syndrome disorders and osteoporosis.

Lifestyle Interventions

What you can do

The new advice on vitamin D from Public Health England, recommends that adults should have 10 micrograms (mcg) of vitamin D every day.

Sunlight: Our main source of vitamin D is from the action of sunlight on our skin. However, during winter (from October until the end of March) in many Northern hemisphere countries the sunlight does not contain enough

UVB radiation to make vitamin D. People with dark skin, from African, African-Caribbean and South Asian backgrounds, may not get enough vitamin D from sunlight in the summer.

Food: Vitamin D is found naturally in a small number of foods, including oily fish such as salmon, mackerel, herring and sardine, as well as red meat, liver and egg yolks. It's also found in fortified foods. However, it's difficult for us to get the recommended amount of vitamin D from food alone.

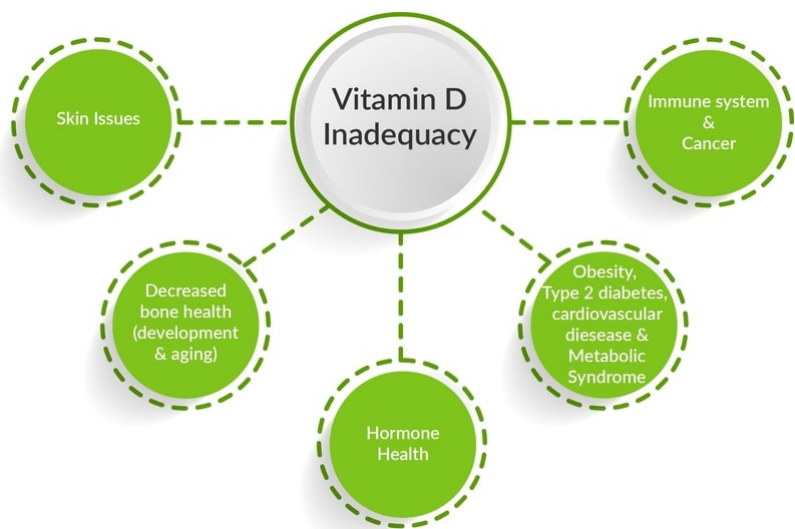
Supplement: If you live in the Northern hemisphere and experience limited exposure to sunlight, then you may want to consider taking a vitamin D3 supplement, especially during the darker winter months. If you have a darker skin colour then you may need to take a supplement year round.

More Information

What does vitamin D do to the body?

We need vitamin D to help the body absorb calcium and phosphate from our diet. These minerals are important for healthy bones, teeth and muscles. A lack of vitamin D, known as vitamin D deficiency, can cause bones to become soft and weak, which can lead to bone deformities. However, we are increasingly understanding that Vitamin D is required by every cell and its deficiency can cause a variety of symptoms in addition to bone decalcification including chronic

fatigue, lowered immune response, inflammation, or muscular-skeletal pain such as lower back pain. This is because vitamin D has crucial regulatory roles in our body and is even able to talk directly to our DNA to up regulate important genes.



Importance of vitamin D

The information about the importance of Vitamin D continues to increase. Some of the human disease's being associated with vitamin D adequacy are highlighted here.



Your Result: Power Exercise

According to your results, you are genetically better suited for power/strength exercises and you may enjoy this type of exercise more.

Strength training is a type of exercise specialising in the use of resistance to induce muscular contraction which builds the strength, anaerobic endurance and size of skeletal muscle. While aerobic means with oxygen anaerobic means without air/oxygen. It is a short lasting, high intensity activity, where your body's demand for oxygen exceeds the oxygen supply available.

Power or Strength training (anaerobic or resistance or body weight exercises)

Examples include weight lifting, all types of sprints (running, biking, etc.), jumping rope, hill climbing, interval training, isometrics, or any rapid burst of hard exercise.

Benefits of strength training

Strength training is important if you want to lose weight, specifically when it comes to burning more fat. This is because muscle twitches at rest burning up energy, whilst fat is dormant at rest. So the more we can build muscle, the more we get a free ride of burning energy even whilst we rest. Lifting weights has a number of benefits, not least of which is helping you lose weight and, of course, keeping your body strong. As a result it helps to:

- Build stronger muscles and reshapes your body so improving appearance.
- Increase muscle mass which boosts your metabolism and aids in weight loss and decreases body fat.
- Improve your VO2 max (the highest amount of oxygen one can consume during exercise) and thus improve your cardio and respiratory fitness.
- Increase your capacity to withstand the build up of waste substances (such as lactic acid) and remove them from the body. This means your endurance and your ability to fight fatigue will improve.
- Improve your energy.
- Increase bone density and strength.
- Improves joint protection.
- Lower your blood sugar by regulating insulin production.
- Improve your ability to perform all the tasks in your daily life.

Overall anaerobic exercise burns fewer calories compared to aerobic exercise. But it is better at building strength and muscle mass and still benefits the heart and lungs. Increased muscle mass helps a person become leaner and to manage weight as muscle uses

large amounts of calories.

Getting started

Note: Please discuss this training with your personal trainer or health club professional

To help get you started try the following workouts;

- Outdoor - sprinting, cycling up hills, hiking uphill, walking up stairs
- Gym - weight training (press ups, pull ups, squats, lunges, weight machines, free weights)
- Other - interval training

More Info

Below are examples of a beginners and intermediate/advanced power/strength workouts.

Beginners or new to exercise - 6 week jumpstart workout program:

If you're ready to jumpstart your body, this 6 week exercise program helps to ease into exercise with simple, effective workouts.

- **Warm up:** Always warm up first for 5 to 10 minutes
- **Frequency:** 3 times a week
- **Duration:** 20 minutes per session
- **Intensity:** 3 sets of 10 repetitions comfortably
- **Exertion level:** Level 5 - 6; above comfortable, you should be sweating and feeling slightly breathless
- **Cool down:** Cool down afterwards for 5 to 10 minutes

Intermediate to advanced

- **Warm up:** Always warm up first for 5 to 10 minutes
- **Frequency:** 3 times a week
- **Duration:** 20 minutes per session
- **Intensity:** 3 sets of 15 repetitions comfortably
- **Exertion level:** Level 7-8 - Work as hard as you can until you feel your muscles burning
- **Cool down:** Cool down afterwards for 5 to 10 minutes



Your Recommended Diet: Reduced Carbohydrate Eating Plan

Our nutritionist has recommended a Reduced Carbohydrate dietary approach due to your genetic predisposition for impaired sugar metabolism. The dietary guidelines are designed to help you remove added sugars and refined carbohydrates from the diet in order to maintain an even blood sugar level. In addition, ensure adequate intake of protein alongside the lower 'sugary' carbohydrates at meal times.

Your overall results also shows that you may become sensitive to some fats. You can lower your risk through adopting a healthy fat eating lifestyle with exercise.

Your genetic profile and clinical questionnaire indicate that you over-absorb sugar and struggle to metabolise sugars correctly. You particularly have the genetic profile that does not do well on refined carbohydrates (bread, pasta, pizza, cakes, etc). Continued over-consumption of sugar, sweet foods and refined carbohydrates can result in worsening weight gain and eventual heart problems and sugar diabetes.

Your recommended diet is a reduced carbohydrate eating plan as you are predisposed to have a high blood sugar level, which leaves you susceptible to premature sugar damage of the body. By cutting out the high-sugar carbohydrate foods and eating low-sugar carbohydrates, proteins and healthy fats, you should be able to move towards optimal wellness for you.

The information below will provide you with the dietary guidelines, which include foods to eliminate in your diet.

Good vs Bad Carbs explained

Carbohydrates or 'carbs' are one of three essential macronutrients (the other two are fats and proteins) and usually are the body's favoured energy source, providing fuel for everyday activities. However, not all carbohydrates are created equal. Carb intake has become controversial these days and there is a lot of information available, much of which splits carbs into good and bad. Let's have a look at these carbs and their health effects which will allow you to make good choices.

"Good" or whole carbs are foods which are minimally processed and packed with natural vitamins and minerals. Sources include vegetables (squash, spinach, broccoli, cauliflower), legumes (such as beans and lentils) and fruit (lower sugar fruits like apples, pears, berries).

"Bad" or refined carbs are from foods like white bread, sugary fruits (peaches), sugar and sweets, pack lots of calories and have little nutritional value. They play havoc with blood sugar levels and result in the body storing them as fat.

Reduced carbohydrate eating supplies fewer carbs than The Eatwell Plate would suggest. While the government recommends that adults get about half of their calories from carbs, your particular genetic sensitivity to carbohydrates means that you may need to reduce your carbs below the standard recommendations. This reduced carbohydrate eating plan will provide reduced amounts of daily calories from carbs, focusing on healthy whole carb sources.

What is dietary Fat?

Fat is an important part of our diet and are made of the same base molecules of carbon and hydrogen but put together in different ways to create different types of fat. The arrangement of the molecules in fat also determines how beneficial the type of fat we eat are for our health. Therefore it can be important to make sure we are consuming the optimal types of fat in our diet, especially if predisposed to sensitivity to some fats.

Fats in our food fall into 2 main types which are easily distinguished: Saturated fats are generally solid at room temperature and Unsaturated which tend to be liquid at room temperature. Unsaturated Fats are then split into either monounsaturated or polyunsaturated. Another layer of complexity is added to our modern diet due to processing of food which changes the chemical structure of the fat we eat and the impact these have on our body.

Saturated fats: These can be split into processed and unprocessed.

Processed saturated fats are also known as "Trans Fats" and should be completely avoided. Trans fats are created when certain fats and oils are heated in industrial processing in the presence of hydrogen gas. This has been popular in the food industry as it makes the fats more stable and have a longer shelf-life. Research has now established that trans fats are detrimental to our health and have been associated with health issues like coronary heart disease, asthma and arthritis. Products which may contain trans fats include margarine and processed foods such as crisps, pastries, fries and biscuits.

Unprocessed saturated fats are those naturally found in both animal and plant foods. The majority are found in animal foods such as beef, lamb, chicken, pork and dairy products. Some plant foods such as coconut, palm oil and peanuts also contain saturated fats. Fat is an important part of our dietary intake for maintenance of body tissues such as our nervous system and also to ensure we are able to absorb certain vitamins which are fat-soluble. However, this type of fat should be limited in our daily intake of food as over consumption can lead to excess fat storage and interfere with metabolism of more beneficial fats such as omega 3. Switch to wild game or free-range meat which has less saturated fat than farmed meat.

Unsaturated fats: These can be split into Monounsaturated and Polyunsaturated

Monounsaturated fats are considered to be healthier for us as research has established they can improve blood lipid profiles and reduce inflammation. Good sources are olive oil (particularly extra-virgin), avocados, most nuts, as well as pumpkin and sunflower seeds.

Polyunsaturated fats can also be split into unprocessed and processed. The act of processing polyunsaturated fats changes their molecular make up and has profound effects on our health when consumed. Hydrogenated vegetable oils are created when vegetable and seed oils are heated in industrial processing in the presence of hydrogen gas. This includes processed vegetable oil often used for cooking and should be avoided altogether. Unprocessed polyunsaturated fats include beneficial omega 3's which are an essential part of the diet as we are unable to make them ourselves. The health benefits of these anti-inflammatory fats are far reaching such as reduced risk of heart attack and osteoporosis, better mental stability and even better protection from sunburn. These fats are found in good quantities in cold pressed flaxseed and oily fish such as mackerel, salmon and sardines.

What to eat and drink

Eat moderate amounts of low-carb vegetables and fruits

Any carb that is processed, like biscuits, breads, pastas, tinned vegetables, sauces will have a high density carb/sugar content. Healthy fruits and vegetables include spinach, broccoli, cauliflower, and fruits like apples, pears and berries.

Eat moderate amounts of healthy fats

Get a mix of fat types from whole, unprocessed, high-quality foods. These include nuts, seeds (hemp, flax, and chia are especially nutritious), fish, olives and avocado.

Consume a limited amount (as part of your plate guidelines) of good quality saturated fat such as pasture-raised/grass-fed animals/eggs and coconut.

Avoid all foods from industrially processed, artificially created, and factory farmed foods, which contain trans fats and hydrogenated oils.

Avoid

Sugar, high fructose corn syrup, wheat, grains, seed oils, trans fats (margarines), artificial sweeteners, low-fat yoghurts and highly processed foods, fruit juices, carbonated fizzy drinks (except for sparkling water).

Disclaimer

This report is for information purposes only and is not intended to be used as medical advice. The information in this report is not intended to treat, diagnose or cure any medical condition or disease. Clients with medical conditions should not change or stop their medications or medical care without consulting with their medical professional first. The information in this report is not intended for children or for women who are pregnant or nursing.

The Lifestyle Assessment Report results are based on the answers to the self-assessment questionnaires that were completed by you.

Any assertions or suggestions in the report as to nutritional supplements, exercise or diet, whether specific or general, are based on the following assumptions that:

- You are in a good state of health and do not have any medical problems that you are aware of;
- You have not had any recurring illness in the past 12 months;
- No medical practitioner has ever advised you not to exercise;
- No medical practitioner has ever advised you to follow a strict diet due to a medical condition or serious illness;
- You are not on any prescribed medication that may affect your ability to exercise safely or to diet or to take nutritional supplements;
- You do not have any food allergies; and
- There is no other reason why you should not follow the suggestions in the Lifestyle Assessment Report.

The information provided by My DNA Health Limited is neither exhaustive nor absolute, and may not be applicable to individual circumstances should the information be subsequently deemed inaccurate or out of date by virtue of new scientific advances. Once your report is provided to you, there will be no further information, feedback, or updates provided to you unless you conclude a separate arrangement for an update regarding new developments.

If you have any concerns at any time about whether or not these assumptions are correct in your particular circumstances, before acting, or not acting, on any of the assertions or suggestions, you must consult a medical practitioner.

You are at all times responsible for any actions you take, or do not take, as a consequence of the assertions or suggestions in the Lifestyle Assessment Report, and you will hold My DNA Health Limited, its officers, employees and representatives harmless against all losses, costs and expenses in this regard. Before acting on any of the assertions or suggestions in the Lifestyle Assessment Report, you must consult your nutritional or healthcare practitioner.

If you have any questions, please ask your registered nutritional or healthcare professional to contact us at customersupport@mydnahealth.co.uk.

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