



Comprehensive Panel Report

Created for: Susan X

Date: 05/05/2017

Practitioner: Practice McPartner



Susan X

Age:	41	Sex:	Female
Height:	162 cm	Weight:	76 kg
BMI:	29	Exercise:	3 or more times a week
Smoke:	No	Alcohol:	Moderate

Dear Susan

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. We have had the pleasure of reviewing your results and would like to give you a brief summary that will help you as you go through the full report.

Taking your genes and questionnaires into account, you have scored well in the following areas:

- Good waist circumference
- Cortisol release

In the section below we have listed potential risk areas where you need to be fairly vigilant when it comes to lifestyle choices. It is important to remember not to treat the moderate and severe genetic variants individually: gene expression is modified by lifestyle and other genes. That is why we have put your individual results in perspective for you by combining them and reporting overall scores in different sections of this report. 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.

1. According to your sleep questionnaire answers, your sleep pattern is severely compromised. Sleep is just as important as good nutrition. Sleep deprivation results in higher levels of cortisol the next day and many of the genes that are affected by a lack of sleep are involved in processing stress and regulating our methylation system. It can also increase the activity of the genes linked to inflammation.
2. According to your questionnaire results you have higher than expected stress level. The perception of stress in the brain leads to high alert and too much adrenaline. If this is not dealt with properly, it can lead to problems with the adrenal glands. Regular exercise or meditation have been proven to be useful in stress management. Certain adaptogenic herbs and nutrients like vitamin B and magnesium can support your adrenal glands and help prevent burnout. You might also wish to consider limiting caffeinated drinks and sugar in your diet to support this. Please discuss this with your nutritional or healthcare practitioner.

3. Your burnout questionnaire results suggest that you may be experiencing some symptoms of adrenal burnout. Lifestyle modifications such as getting eight hours of sleep, limiting caffeinated drinks, sugar and reducing stress are all important to support your adrenal glands. There are specific herbal and nutritional supplements that have been designed to support tired adrenals, please discuss your options with your nutritional or healthcare practitioner.
4. You have a high risk for food cravings. These cravings may be sweet or savoury. Please be aware of this risk and limit your caloric intake to just 3 meals a day with no snacking in between. Exercise has been proven to help as does supplementation of chromium and magnesium. Be aware of your triggers, like stress and manage those as well.
5. You have the genetic risk potential to over absorption of certain fats from the intestine. Unfortunately, the fatty acids that are absorbed are prone to being affected by oxidative stress, which then might affect the removal of sugar from the blood. A diet low in unhealthy fats and refined carbohydrates and rich in antioxidant phytonutrients will help to reduce this risk. Exercise has also been shown to reduce risk gene expression, and should be encouraged.
6. Your results indicate an impaired potential for fat release. This means that you should be mindful of your food choices and ensure that you are exercising enough to stimulate fat release for energy. Exercise and caffeine have been shown to stimulate beta receptors to release fat for energy. However, if you are a slow metaboliser of caffeine, limit coffee intake to one cup a day, ideally, 30 minutes before exercising. Discuss with your nutritional or healthcare practitioner.
7. Your overall results for sugar metabolism and sensitivity indicate that this is an area of metabolism that probably needs support in the form of avoiding sugar and refined carbohydrates. Avoid added sugar and limit your intake of sugary fruit. It is important to keep sugar and insulin levels low in the body as insulin has a negative impact on inflammation as well as the hormones that release fat. Reducing your consumption of sugars and refined carbohydrates will decrease insulin in the body and help to keep fat cell receptors open in order to cut into your fat stores for energy.
8. Your questionnaire results and genetic potential for poor detoxification indicate that you will need to support yourself through vigilant toxin avoidance and healthy lifestyle habits. Your questionnaire results are severe, this indicates that your lifestyle is currently not supporting the underlying risk genes as they are expressing freely and making you feel toxic. You may need support in the form of a supplement until your questionnaire results improve. Please discuss this with your nutritional or healthcare practitioner.
9. Your results for methylation indicate that you will need to support this important process through toxin avoidance and vigilant lifestyle habits. It is important to ensure healthy sleeping habits, as well as making sure that you are eating dark, leafy green vegetables daily and exercising moderately. If you have symptoms such as fatigue, insomnia, depression, inflammation, brain fog and hormonal imbalances, you may need to introduce a supplement that gently supports methylation. Please discuss supplementation with your nutritional or healthcare practitioner. It is not advisable to take supplements without the support

of a qualified professional.

10. You have a high potential risk for poor oestrogen metabolism. You can support oestrogen metabolism by ensuring good overall detoxification. You may need to increase your consumption of cruciferous (broccoli, brussel sprouts and cabbage), allium vegetables (garlic and onions) and fibre. These will all provide the nutrients needed to support oestrogen metabolism as well as detoxification and will likely improve bowel function. You should also avoid toxins such as polyaromatic hydrocarbons (charred meat) and xenoestrogens (such as biphenyl A from plastic water bottles).
11. You have a risk potential for inflammation. You should avoid pro inflammatory foods such as trans fats and refined carbohydrates. Choose foods that are as natural as possible and be sure to include healthy portions of leafy greens and colourful vegetables.
12. Glutathione production may need support. Glutathione is intimately involved in combating oxidative stress and in detoxifying unhealthy oestrogen, drugs and metals like mercury and aluminium. Glutathione works with vitamin C to reduce damage caused by free radicals. You can support this pathway by adding colourful fruit and vegetables, specifically cruciferous (broccoli and cauliflower) and allium vegetables (onion and garlic) to your diet. If you are deficient in glutathione then it is very important to replace it as a supplement so please discuss this option with your nutritional or healthcare practitioner before starting any supplements.
13. You are a slow metaboliser of caffeine and should limit your caffeinated drinks to 1 a day. Excessive consumption of caffeine can increase your risk of cardiovascular problems such as hypertension.
14. You may benefit from eating more antioxidant rich foods such as colourful fruit and vegetables (berries, broccoli etc.). Discuss with your nutritional or healthcare practitioner.
15. You have an increased need for B vitamins, specifically dietary folate, B6 and B12. Please discuss these options with your nutritional or healthcare practitioner before starting any supplements.
16. You may have a predisposition to storing excess iron. Please consult with your healthcare provider before taking any supplements that contain iron.
17. You may need to increase your intake of dietary omega-3 and limit omega-6 dietary sources. You may also benefit from supplementing the diet with a good quality omega-3 EPA and DHA. Please discuss with your nutritional or healthcare practitioner before taking any supplements.

Your recommended dietary and exercise plans are as follows:

Diet: Low Toxin, Low Sugar, Healthy Fat Plan

Exercise: Strength | Cardio

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 your 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 ● Good ● Moderate ● Severe

Methylation ●

Apolipoprotein E ●

Stress Questionnaire ●

Burnout Questionnaire ●

Cortisol Release Questionnaire ●

Sleep ●

Food Cravings ●

Muscle Function / Exercise
Moderate twitch / Combined ●

Sugar Metabolism ●

Detoxification Phase 1 ●

Detoxification Intermediate Phase ●

Detoxification Phase 2 ●

Fat Sensitivity and Overabsorption ●

Inflammation ●

Fat Release ●

Oestrogen Imbalance ●

Nutritional Requirements and Sensitivities					
Lactose Intolerance	●	Iron Overload	●	Caffeine Metabolism	●
Folate	●	Glutathione	●	Antioxidants	●
Vitamin B	●	Vitamin D	●	Magnesium	●

Recommended Diet: Low Toxin Low Sugar Healthy Fat Plan

Recommended Exercise: Cardio, Strength

Summary of your results



Sugar Metabolism - **Severe**

We have tested a number of genes for glucose over-absorption, arterial inflammation and insulin resistance. The combined DNA and questionnaire result indicates that you have a compromised sugar metabolism pathway which needs support in the form of diet and lifestyle choices.



Sleep - **Severe**

Your sleep questionnaire results indicate that your sleeping patterns are in need of improvement in order to prevent help prevent possible food cravings, weight gain, methylation imbalances and high cortisol levels.



Food Cravings - **Severe**

According to the two genetic pathways we tested as well as the Cravings questionnaire you filled in you have a predisposition to crave food. To manage that, avoid addictive foods such as sugars, bread and alcohol and be aware of your triggers (stress, for example).



Fat sensitivity and over-absorption - **Moderate Risk**

According to the gene tests we have performed, you have a moderate genetic tendency to over-absorb some fats in your diet.



Ability to release fat from fat cells - **Impaired**

Your beta-receptors are impaired in their ability to allow fat to be released back into the bloodstream for energy use.



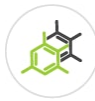
Stress - **Moderate**

Your results show that some lifestyle modifications to better manage stress can improve your stress levels and, in turn, your overall health.



Burnout - **Moderate**

Your burnout level is considered borderline. This implies that you may have slightly elevated levels of adrenal burnout.



Cortisol Release - **Low**

According to your questionnaire results, your cortisol release is considered to be fine.



Detoxification Phase 1: **Severe**

Your overall DNA and questionnaire results show your phase 1 detoxification pathway requires support. This can be obtained through toxin avoidance and a diet which includes cruciferous vegetables and dark leafy greens.



Detoxification Intermediate Phase: **Moderate**

Your gene results show that your intermediate detoxification phase may be moderately compromised and may increase oxidative stress and inflammation.



Detoxification Phase 2: **Severe**

Your DNA and questionnaire results show your detoxification phase 2 pathway may require additional support in the form of nutrition and lifestyle choices.



Methylation : **Severe**

Your results show that this vital process may be compromised and could benefit from support in order to reduce the risk of associated health issues in case of imbalance.



Oestrogen Dominance : **Severe Dominance risk**

Your results show you are prone to oestrogen dominance and may be feeling symptomatic. Oestrogen detoxification pathway can be supported via toxin avoidance, nutrition and lifestyle changes.



Inflammation : **High risk**

Your genetic and questionnaire results indicate that you may be prone to inflammation and might benefit from lifestyle and dietary support to regulate chronic inflammation, which can be damaging to the body.



APOE - **APOE 3:4**

We have tested the APOE gene responsible for transporting cholesterol healthily across the blood-brain barrier and into the brain. Your result indicates that you have the APOE4 risk variant and should still be mindful of sugar consumption that can inhibit this variant's ability to attract healthy cholesterol into the brain.



EFA Metabolism - **Impaired**

You may need to increase your intake of dietary omega-3 and limit the intake of omega-6.



Lactose Tolerance: **Low Risk**

You do not have the genetic variant for lactose intolerance. However, if you are experiencing gastrointestinal or digestive problems, please consult your nutritional or healthcare practitioner.



Caffeine Metabolism: **Slow**

You are likely a slow metaboliser of caffeine and might benefit from limiting your caffeine intake.



Glutathione requirement: **High**

You may be deficient in glutathione and therefore need additional support in the form of natural foods like cruciferous and allium vegetables, and if necessary, supplementing with glutathione or N-acetyl Cysteine, a precursor to glutathione. Please discuss these options with your nutritional or healthcare practitioner before starting any supplements.



Folate requirement: **Moderate**

Your overall need for folate is slightly increased and needs additional support in the form of consuming enough dark leafy green vegetables daily.



Antioxidant requirement: **High**

You have risk variants for oxidative stress and have an increased need for antioxidants.



Vitamin D requirement: **Good**

You do not have increased need for Vitamin D.



Vitamin B requirement: **High**

You have an increased need for B vitamins (such as B6 and B12). Focus on obtaining your daily B vitamin requirements from natural foods first, then discuss supplementing with your nutritional or healthcare practitioner, if necessary.



Iron Overload: **Moderate risk**

You may be at risk for storing excess iron. Please consult with your nutritional or healthcare practitioner before taking any supplements that contain iron.



Magnesium requirement: **Good**

You do not have additional need for magnesium. Getting it through natural foods should be adequate to support you.



Diet: Low Toxin Low Sugar Healthy Fat Plan

This plan was suggested to better support your lifestyle and genetic potential for poor detoxification. Follow the low toxin plan for up to 4 weeks, then move to Low Sugar Healthy Fat plan. This plan was recommended to support your overall sugar metabolism and genetic potential for increased sensitivity to saturated fats.



Exercise plan: Cardio, Strength

According to your DNA results, you are genetically suited for a balance of strength and cardio exercises and you might enjoy this type of workout more.

The table below displays your genetic variations, known as single nucleotide polymorphisms (SNP's).

SNP Results



-/- Normal/Wild Type

*See note at end



+/- Heterozygous

(one variant)



+/+ Homozygous

(two variants)

Gene	Result	Description
ACTN3	CT +/-	Indicates that you have one copy of the alpha-actinin-3 in fast-twitch muscle fiber. It is more frequent in endurance athletes and very rare in elite power athletes.
ADRB2 Gly16	GG +/+	This result indicates that you will really struggle to unlock your B-receptors and have a tendency to put on weight via abdominal fat. Studies show that GG-allele carriers struggle to lose weight and put weight back on more easily than the average person. You may also struggle to lose weight easily with exercise.
ADRB2 Glu27	GG +/+	GG allele carriers may suffer from increased abdominal weight gain when on a high carbohydrate diet. Removing excess and refined sugar and carbohydrates from your diet is important. You may benefit from Beta-receptor stimulation before exercise with caffeinated supplements.
APOA2	TT -/-	No heightened sensitivity to saturated fat
APOE	APOE3:4	APOE is the fatty acid transporter that is active in transporting cholesterol healthily across the blood-brain barrier and into the brain. APOE4 carriers need to follow a healthy diet, rich in phytonutrients, and focus on good fats high in DHA. These people are susceptible to toxins found in cigarettes and alcohol. To lower any further risk of degenerative conditions created by high blood sugar, a low sugar diet is also recommended.
CBS	AG +/-	The A Allele is associated with decreased risk of CVD due to reduced homocysteine but in the presence of electrolyte deficiency or fatigue, can up regulate the conversion of homocysteine to Ammonia rather than Glutathione.
COMT	GG -/-	The G allele has higher COMT enzymatic activity causing a more rapid breakdown and thus lower levels of dopamine. In the brain, the GG allele is seen as the "warrior" and metabolises dopamine quickly. In the liver, kidneys and blood it is used to regulate oestrogen.
CYP1A1	AG +/-	An A to G substitution leads to an upregulation of Phase 1 detoxification. Reduce exposure to procarcinogens and optimise Phase 2 detoxification.
CYP1A2	CC +/+	Slow metaboliser of caffeine, This enzymes activity can be enhanced by eating more cruciferous vegetables such as brocolli and brussel sprouts.
CYP1B1	GT +/-	The G Allele has a 3 fold higher activity than the T Allele. It is important to reduce exposure to environmental carcinogens and attention should be paid to optimising Phase 2 detoxification .

eNOS/NOS3	GG -/-	No impact.
FABp2	CT +/-	Indicates a moderately increased sensitivity to saturated fats.
FADS1	TT +/+	You have a compromised delta-5-desaturase enzyme activity which may impact downstream production of certain omega 3 fats and you may consider supplementing EPA & DHA to your diet.
FADS2	CC -/-	No Impact
FTO	AT +/-	Indicates a moderately increased sensitivity to fats. You may also benefit from increased levels and intensity of physical activity.
GSTM1	Absent	A GSTM1 deletion results in an absence of the enzyme which means a person is not able to use the GST enzyme, leading to reduced capacity to clear toxins and increased risk for chemical sensitivity. To compensate for reduced activity, the other GST enzyme activities can be induced in part by adding to the daily diet colourful fruit and vegetables, cruciferous (e.g. broccoli and cauliflower) and allium vegetables (e.g. onion and garlic) to assist the glutathione detoxification system in removing harmful substances from the body. When dietary intake is inadequate supplementation may be required. It is also important to minimize exposure to toxins.
GSTT1	Absent	GSTT1 is absent which indicates a person is not able to use the GSTT1 enzyme to clear toxins and therefore at an increased risk of poor detoxification. To compensate for reduced activity, the other GST enzyme activities can be induced in part by adding to the daily diet colourful fruit and vegetables, cruciferous (e.g. broccoli and cauliflower) and allium vegetables (e.g. onion and garlic) to assist the glutathione detoxification system in removing harmful substances from the body. When dietary intake is inadequate supplementation may be required.
HFE C282Y	GG -/-	No impact.
HFE H63D	CG +/-	The G allele is associated with an increased risk of hemochromatosis. You might consider doing regular checks of serum iron and ferritin levels, especially if you also carry HFE C282Y A allele risk.
IL6R	CC +/+	The C allele has been associated with raised IL-6 and CRP concentrations which is associated with inflammation, obesity, insulin resistance, dyslipidaemia and hypertension. This is made worse by smoking. People with the C allele should follow a diet rich in antioxidants and high in Omega 3. Toxin avoidance would also assist this SNP.
MC4R	CT +/-	Indicates a moderately increased sensitivity to saturated fats. This will also contribute to increased refined carbohydrate sensitivity.

MCM6	TT -/-	No impact.
MnSOD/SOD2	CC +/-	The mitochondrial antioxidant manganese superoxide dismutase (MnSOD) detoxifies free radical O ₂ which is generated by mitochondrial respiration. The C Allele is the risk allele for this gene. The risk associated with this gene can be greatly reduced by eating a range of colourful fruit and vegetables and if needed, additional supplementation.
MTHFR 677	TT +/-	Homozygote (two copies) can have about 70% reduced enzyme activity. Indicates that you may be deficient (TT allele) and that there is only a 20-30% functioning of this part of the methylation pathway. This gene produces an enzyme that is necessary for properly using vitamin B9, as well as converting homocysteine into methionine, which the body needs for proper metabolism and which is needed for glutathione creation. Phase 2 detoxification also involves this enzyme, so those with a T allele may have trouble effectively eliminating toxins from their body. Methylation may need to be supported.
MTHFR 1298	AC +/-	MTHFR A1298C mutation is very common and does not seem to pose too much concern unless there are other methylation or cytochrome mutations present. The C allele may result in 20% loss of function of this enzyme and methylation may need to be supported.
MTR	AG +/-	The G Allele is associated with decreased levels of Homocysteine as this SNP increases the activity on the enzyme that converts homocysteine to methionine. It also indicates an increased need for B12.
MTRR	GG +/-	The G allele is associated with increased need for vitamin B6 and B12.
NQO1	CT +/-	You have a moderately compromised ability to produce NQO1 one of a number of antioxidative enzymes in the body
PPARG	CC +/-	You have a severely compromised gene for fat absorption into cells. This gene converts excess dietary energy into fat. The worst combination are foods containing unhealthy fats and sugars such as doughnuts, pizzas, white breads, biscuits, muffins and waffles. It is the unhealthy fats plus sugars together that are bad for this gene.
TCF7L2	CT +/-	A person with a T allele has increased risk for insulin resistance and type 2 diabetes, especially if they are obese and have low HDL. The T allele has also been associated with less weightloss in response to diet and lifestyle intervention, especially when fat intake is high. You require diet and lifestyle changes that include low sugar and moderate healthy fats. Increased exercise may also be beneficial.
TNF alpha	GG -/-	No impact.
VDR fok	CC -/-	No impact.

VDR taq	CC -/-	No impact.
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How to read your gene results

We have two copies of most of the genes we are born with - one from our mother and one from our father. myDNAhealth uses your unique DNA sequence to determine if one or both copies have a variation at a specific location in a specific gene. In the results table you will see the gene name, SNP result with the associated impact (colour coded) and an explanation.

The results are displayed as follows:

- **Wildtype/norm:** if there are no variations
- **Heterozygous:** if one copy of the gene is different
- **Homozygous:** if both copies have a variation

The impact associated with each result is displayed as follows:

- **No, Mild or Beneficial Impact:** -/-
- **Moderate Impact:** +/-
- **High Impact:** +/+

It is also important to understand that having a homozygous or heterozygous variant does not mean that the gene is defective or non-functioning, only that it is working with an altered efficiency. Sometimes this means that it is working at a decreased level, but it could also mean that it is functioning at a higher than normal efficiency, or that the gene is lacking regulatory mechanisms normally involved in its expression. Sometimes the wildtype is a risk.

Wellness & Weight Management

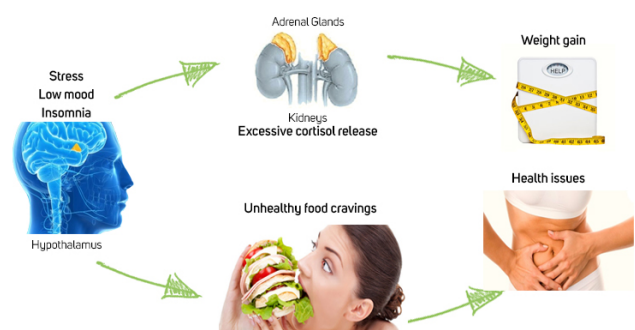
How our body processes nutrients such as fats and sugars is partly determined by our genes. Another determining factor is our environment and our lifestyle. In this section, we look at several areas that combine genetic and lifestyle factors to assess your overall sensitivity to carbohydrates (sugars) and fats, ability to release fat and the tendency for food cravings. We also analyse your environment including sleep pattern and stress levels to have a more comprehensive picture.

Food Cravings

Low mood and stress can cause insomnia in many people. Not getting enough sleep may lead to unhealthy food cravings to make up for the lack of energy and dopamine the next day. This can be especially pronounced if you are genetically predisposed to experience cravings.

We can't change our genes, but we can support them to perform better and protect ourselves from potential negative impact.

Stress, especially if prolonged, may cause the adrenal glands to produce more cortisol - the stress hormone - that is involved in converting those excess sugars that we crave into fats.



Carbohydrate (Sugar) Metabolism and Sensitivity

High sugar and refined carbohydrate intake can lead to health problems. Sensitivity to sugars and certain carbohydrates may mean that the process of glucose uptake into the blood to help make energy, regulated by insulin (a hormone that helps carry glucose out of the blood and into cells), is not functioning correctly and causes blood sugar dysregulation.

When the blood sugar level is too high the body converts the excess to glycogen (short-term energy fuel, stored mainly in the liver and muscle cells) or fat. The blood sugar level may go too high, and then drop too low which can contribute to weight gain and lethargy. In the long run, this extreme form of blood sugar dysregulation results in the body no longer able to produce sufficient insulin and may lead to diabetes and obesity.

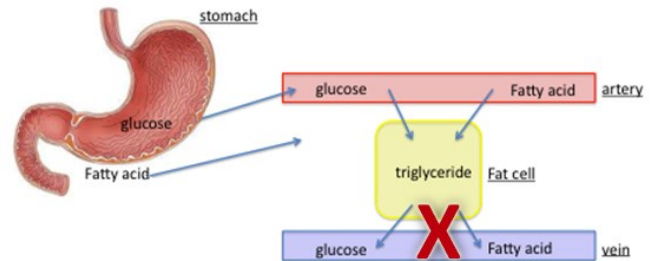
Fat Metabolism and Sensitivities

Most people in the Western world eat too much of the wrong kind of fats like saturated fats and too little of the healthy and essential fats our body needs for optimal health. Genetics play a role in the transport and metabolism of these fats and a sensitivity means that some fats might be over-absorbed in the intestine from food. This can potentially lead to raised cholesterol levels in the blood. Luckily, all these genetic predispositions can be managed with an appropriate nutrition combined with the right exercise and lifestyle supporting these genetic risk variants.

Fat Release for Energy

The ability to release fat from fat cells is regulated by adrenoreceptor genes. At the bottom of every cell is a beta receptor that, if opened, releases fat from cells to be used for energy.

Those who can access this plug easily are able to harness their fat stores during exercise and tend to lose weight quickly with exercise. If these receptors are genetically impaired and you are sensitive to insulin, your body may find it even harder to efficiently burn fat, may feel that you run out of energy quickly when exercising and feel hungry shortly after.



Sleep

Result: **Severely Interrupted**

Your answers in the sleep questionnaire indicate that your sleep patterns are severely disturbed. Sleep is important and helps our hormones rebalance, and supports healing, detoxification and gene expression.

You may have a problem with either weak sleep hormones or stressful thoughts keeping you awake. If you are waking up in the middle of the night then it may be caused by your stress and anxiety levels. If you are struggling to fall asleep then it may be linked to melatonin or cortisol levels.

Questionnaire Result

Unhealthy Sleep

What can you do to beat disrupted sleep?

- **Make sure you are not hyper-stimulated before bed:** Cut out any coffee or caffeine products after lunch. Cut out any sugar stimulatory products in the evening (chocolate, desserts, sugar, sweets)
- **Reduce brain overstimulation in the evening:** Avoid watching TV in the bedroom, working or playing computer games until just before bed, charging your mobile phone next to your bed, having pets or children sleeping with you.
- **Relax the brain before bed:** Have a wind-down routine of closing windows and locking doors, consider stretching, meditation or having a bath with lavender oil or magnesium salts before bed, 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.
- **Consider additional nutrients** that has a calming effect and/or support serotonin and melatonin production to help you get into healthier sleeping patterns. Please discuss with your nutritional or healthcare practitioner before taking any supplements.

Always seek help from a healthcare provider if sleep remains disrupted.

The Risks Facing Those Who Don't Get Enough Sleep

Poor sleeping patterns could lead to major health issues such as obesity, heart disease, high blood pressure and diabetes. The University of Surrey in the UK has also found that inadequate sleep affects 700 genes and leads to more than the expected cognitive impairment.

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.

We can also struggle to sleep for two reasons: either we start to run out of the sleep hormone melatonin; or we have circulating worrisome thoughts that stimulate adrenaline and cortisol that keep us awake. If we are deficient in sleep then we also start to run out of serotonin - our happy hormone. This can result in a low mood and food cravings.

Food Cravings

Result: **Severe**

You have a strong genetic predisposition to crave food in the two genetic pathways we have tested. You must try to avoid addictive foods such as sugars, bread and alcohol. You should note that food cravings will increase during stressful periods and periods of insomnia.

How it works

Cravings generally evolve as serotonin, the happy hormone decreases and we need to rely on dopamine, the excitement and cravings hormone. If we can support both of these hormones then we can go a long way to breaking the habit of craving certain foods.

Questionnaire Result

Unhealthy Cravings

SNP	Result	Allele
FTO	+/-	AT
MC4R	+/-	CT



Stress

Result: **Moderate**

Your score in the stress and anxiety questionnaire is moderate. This implies slightly higher than normal levels of stress and anxiety.

Questionnaire Result

Moderate

What to do

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.
- **Beathing 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.

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 defenses 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. The adrenal glands release adrenaline and cortisol – hormones that provide you with the extra energy and strength required for either fight or flight. This 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.

Prolonged cortisol elevations can affect 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). Some of the symptoms of hypoglycemia, such as irritability and nervousness, may sometimes be the effects of high levels of stress hormones.

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.

Stress also impacts on digestion and the gut may need additional support in the form of a digestive enzyme. This can also take some stress off the liver helping release amino acid methionine to aid detoxification pathways and tryptophan which is then converted to serotonin and melatonin to support mood and sleep. 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

Result: **Moderate**

According to the answers in the questionnaire, your burnout level is considered borderline and indicates you may be experiencing some level of adrenal fatigue.

How adrenal fatigue impacts our health

Burnout is a state of emotional, mental, and physical exhaustion caused by excessive and prolonged stress. It occurs when you feel overwhelmed and unable to meet constant demands. As the stress continues, your adrenal glands continue to produce cortisol - the stress hormone - to meet those demands. After a while, your adrenals may become fatigued and you may begin to lose interest or motivation that led you to take on a certain role in the first place. Typical symptoms of adrenal include:

Burnout reduces your productivity and saps your energy, leaving you feeling increasingly helpless, hopeless, cynical, and resentful. People with adrenal fatigue are in a real bind because when they are under stress, demand for blood glucose increases, but their fatigued adrenals have difficulty producing enough of the necessary hormones to generate higher glucose levels from reserves. Further complicating this matter is that during stress, insulin levels are increased because the demand for energy in the cells is greater.

Both stress and adrenal fatigue can contribute to hypoglycemia (low blood sugar) because of the key roles the adrenal hormones epinephrine, norepinephrine and cortisol play in blood sugar regulation. Stress (and the anticipation of stress) signals the body to raise blood sugar (glucose) levels in order to generate energy to respond to the stress. If the body cannot meet this higher demand for blood glucose, hypoglycemia can result.

During adrenal fatigue, when adrenal hormone levels are lower, it becomes harder

Questionnaire Result

Moderate

to maintain blood sugar balance, especially in response the increased demand from stress. It has been known for almost a century that people who are chronically hypoglycemic are often also experiencing adrenal fatigue, and that people going through adrenal fatigue almost always have some form of irregular blood sugar pattern. Hypoglycemia is the most common of these.

Cortisol release

Result - Low

According to the answers in the questionnaire, your cortisol release is considered to be in the healthy range.

How it works

The effects of chronic overexposure to cortisol can be devastating. Prolonged cortisol elevations can result in sustained elevations of blood sugar, loss of muscle mass and increased fat accumulation. When the cortisol levels are unbalanced, sleep patterns can be affected. Excess cortisol keeps us awake which leads to further excess cortisol secretion the next day resulting in food cravings and eventual weight gain.

Questionnaire Result

Healthy

Carbohydrate (sugar) Metabolism & Sensitivity

Result: Severe

We have analysed how sugar is absorbed from the intestine, how sugar inflames and damages arteries. Some people might 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 can lead to weight gain and eventually obesity and type 2 diabetes.

We have combined the DNA and the questionnaire results to assess your overall risk. You have compromised genes overseeing this sugar metabolism pathway. You will need to make some dietary and lifestyle changes to help control blood sugar levels. If necessary, you may also benefit from supplements with natural ingredients that assist stabilising sugar and insulin levels such as alpha lipoic acid, cinnamon and chromium. However, before taking any supplements, please discuss with your nutritional or healthcare practitioner.

How it works

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, such as brown rice or quinoa, are broken down into glucose more slowly. When glucose is released too quickly it disrupts the body's blood sugar level, which can then be harmful to your health over the long term, and dramatically affect your ability to manage weight effectively.

Sugar Questionnaire

Unhealthy

Insulin Result

Unhealthy

Glucose Result

Unhealthy

Arterial Inflammation

Unhealthy

SNP	Result	Allele
ADRB2 Gly16	+/+	GG
ADRB2 Glu27	+/+	GG
FTO	+/-	AT
IL6R	+/+	CC
MC4R	+/-	CT
PPARg	+/+	CC
TCF7L2	+/-	CT
TNF alpha	-/-	GG

Fat sensitivity and over-absorption

Result: Moderate

According to the genetic test we have performed, you have a tendency to over-absorb some fats. You should avoid fried foods (trans fats) and limit animal based fats (saturated fats), but you will still gain benefit by including healthy fats such as fish oil, olive, hemp and Evening Primrose oils as part of your eating plan.

How it works

The world used to be obsessed with removing fat from our diets to reduce obesity and heart attacks. Since 2000, we have turned our focus to sugar as being the big danger in causing health problems. In our excitement about sugar, we have forgotten that eating certain "bad" fats is potentially an issue for people.

Some people over-absorb fat from the intestine into the blood stream, increasing blood cholesterol and risk of blocked arteries. This can also make the liver work hard to store it and increases fat storage.

SNP	Result	Allele
FABp2	+/-	CT
APOA2	-/-	TT
PPARG	+/+	CC
APOE	APOE3:4	

Ability to release fat from fat cells

Result: Severe

According to the genetic test and your insulin result, you have an impaired ability to release fats. This means you have reduced functionality of your beta-receptors on fat cells as they are mildly impaired in their ability to allow fat to be released back into the bloodstream for energy use. Insulin can also block beta-receptors, worsening this problem.

You may have a tendency to put on weight easily without eating much and possibly notice the tendency to lose weight very slowly with exercise. If that is the case, it is important for you to be aware of your sugar intake and minimise the need for insulin release. Exercise and caffeine products have been shown to help open up these receptors. If you are sensitive to caffeine, discuss this option with your nutritional or healthcare practitioner.

How it works

At the bottom of every cell is an important plug (beta receptor) that if opened, releases the fat from the cell to be used for energy. People who can access this plug easily are able to harness their fat stores during exercise and tend to lose weight quickly with exercise. People who struggle to open these beta receptor plugs are not able to employ fat for energy during exercise and need to focus more on their diet than exercise to lose weight.

Insulin Result

Unhealthy

SNP	Result	Allele
ADRB2 glu27	+/+	GG
ADRB2 Gly16	+/+	GG
FTO	+/-	AT
PPARG	+/+	CC
TCF7L2	+/-	CT

APOE

Result: APOE 3:4

We have tested the APOE gene responsible for transporting cholesterol healthily across the blood-brain barrier and into the brain. Your result indicates that you will benefit from healthy nutrition and lifestyle. The APOE4 is considered a risk variant and to neutralise this risk, you need to minimise sugar consumption, limit your

intake of saturated fat intake and focus on eating healthy fats, as well as increase phytonutrient antioxidants. You may also be more susceptible to toxins and need to lead a healthy lifestyle: getting enough exercise, avoiding alcohol, and not smoking. Discuss this with your nutritional or healthcare practitioner.

How it works

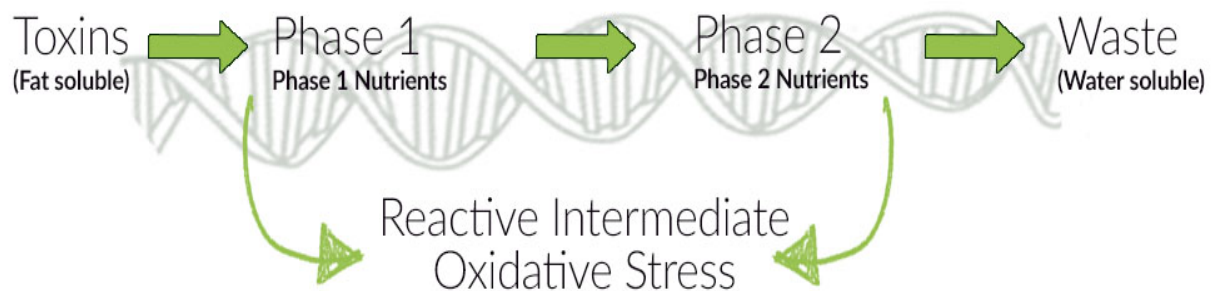
Apolipoprotein E (APOE) is the fatty acid transporter that is active in transporting cholesterol healthily across the blood-brain barrier and into the brain. It has a multi-function role in lipoprotein metabolism and is essential for the normal breakdown of triglycerides-rich lipoprotein.

Introduction to Liver Detoxification

In the report we have examined the areas where your genes may need some support in order for you to effectively remove toxins from your body. We have assessed the three stages, Phase 1, the Intermediate phase and Phase 2 individually.

The term detoxification is used to refer specifically to the intracellular biotransformation process that occur in the Phase 1, Intermediate and Phase 2 processes in the liver. Detoxification refers to any process of decreasing the negative impact of xenobiotics, otherwise known as chemicals or molecules that are foreign to the biologic system, originating externally (from toxic substances in the environment) or internally (from some food and metabolic byproducts), on bodily processes. The process of detoxification involves biotransformation of these molecules into metabolites that can then be easily excreted by the kidneys and the colon.

Detoxification Pathways



The liver is the main detoxification organ of the body responsible for neutralising and eliminating the extra toxins that our bodies are exposed to on a daily basis. When optimum nutrition is provided, the liver operates efficiently. Unfortunately, too many people have diets that are toxic or contain insufficient nutrients to provide the liver with everything it needs for the detoxifying process. If nutrition is compromised through these poor dietary and lifestyle habits, the detoxification process will be impaired and health will suffer as the body retains the toxins it cannot eliminate.

There is more to detoxification than just the liver. If the bowel is constipated (less than a bowel motion daily), then many of the toxins eliminated by the liver through the bile get reabsorbed in the small intestine, and return to the liver, making it work extra hard to remove the excess load. If the gut flora is imbalanced, then the toxic bacteria or yeasts in the intestines create even more toxic chemicals, causing a vicious cycle of toxic overload to be experienced. The kidneys filter and excrete toxins through urine, but also require support in the form of adequate hydration. Drink filtered water to improve both kidney and bowel function in order to support your detoxification.

The rate at which the liver can eliminate toxins can determine susceptibility to toxic overload, which in turn can lead to symptoms of poor health. Many inflammatory conditions such as arthritis, cardiovascular problems, headaches, chronic fatigue, and premature ageing can all be caused by a buildup of toxins that the liver is not able to cope with.

As mentioned, the liver uses a two-step enzymatic process to neutralise unwanted chemical compounds, with an intermediate step that is pro inflammatory and prone to oxidative stress. These toxic compounds include toxins such as drugs, pesticides, as well as toxins from the gut and normal body chemicals such as hormones and inflammatory chemicals (such as histamine) that become toxic if allowed to accumulate in the body.

Detoxification Phase 1

Results: **Severe**

We have assessed your sleep patterns and levels of toxicity and tested the three main CYP genes from the Cytochrome P450 family of genes that are responsible for detoxification of toxicants such as xenobiotics, certain drugs and caffeine, as well as hormones and neurotransmitters.

Your overall gene and questionnaires result shows potentially severely compromised Phase 1 liver detoxification pathway and you will need to be more aware of your exposure to toxins. When this pathway is not working properly, one of two things happens. i) The enzymes have been inhibited and there are not enough of them to bind to the toxins, which means they are unable to detox the toxicants you have been exposed to. ii) The enzymes are working too fast and are making the toxic intermediates more rapidly than your body can deal with them.

What to do

Ensure Phase 2 detoxification is being well supported by toxin avoidance. Follow a healthy diet and include cruciferous vegetables, artichokes, dark leafy greens, and liver supporting nutrients. Limit caffeinated drinks to one a day, ensure you have regular bowel movements and healthy gut flora. Please consult your nutritional or healthcare professional who will give you more information on liver support through diet and supplementation.

How it works

Phase 1 detoxification in the liver takes fat soluble toxins and breaks them down into water soluble intermediate substances. These substances are more toxic than the original substance as they are now water soluble. The main genes involved in Phase 1 detoxification are part of the Cytochrome P450 enzyme family.

The only food that can be a problem if someone is on pharmaceuticals is grapefruit which contains furanocoumarins. Furanocoumarins can irreversibly inhibit a cytochrome P450 metabolising enzyme used by Phase 1 to metabolise almost 50% of all drugs, as a result, many drugs are impacted by consumption of grapefruit.

SNP's in Phase 1 are best supported by optimising Phase 2 detoxification and ensuring optimal antioxidant intake.

Toxicity Questionnaire

Unhealthy

Sleep Questionnaire

Unhealthy

SNP	Result	Allele
CYP1A1	+/-	AG
CYP1A2	+/+	CC
CYP1B1	+/-	GT

Detoxification Intermediate Phase

Results: **Moderate**

We have tested the genes responsible for oxidative protection and inflammation. Your intermediate detoxification phase is moderately compromised.

What to do

Even if the intermediate phase is only mildly compromised, it is important to adequately support it as it may be disruptive for overall detoxification. You will need to be extra vigilant about eating a rainbow of colourful vegetables and fruit to support this process adequately. You may want to focus on anti-inflammatory foods such as turmeric and Omega 3 from fish oils if you are prone to pain and inflammation. Additional supplementation of anti-oxidants may also be beneficial, but please discuss this with your nutritional or healthcare professional.

How it works

A significant effect of Phase 1 detoxification is the production of free radicals as the toxins are transformed. For each molecule of toxin metabolised by Phase 1, one free radical molecule is generated. Without adequate free radical defenses, every time the liver neutralises a toxin, it is damaged by the free radicals produced.

Antioxidants, such as reduced glutathione, vitamins C and E, carotenoids, flavonoids and selenium reduce the damage caused by these free radicals. If antioxidants are deficient and toxin exposure is high, toxic chemicals become far more dangerous. These free radicals are also pro inflammatory and can be a factor in inflammatory conditions.

SNP	Result Allele	
eNOS	-/-	GG
IL6R	+/+	CC
MnSOD	+/+	CC
VDRtaq	-/-	CC

Detoxification Phase 2

Results: **Severe**

We have assessed your sleep patterns and levels of toxicity and have tested a number of genes responsible for Phase 2 detoxification. Your results have come back as severely compromised and will require some additional support from you.

What to do

You must try to avoid toxins, eat organic food and where necessary, add supplementation of supporting nutrients. The genes that we have tested are easily overwhelmed if too many toxins are present, so if you have any form of metal toxicity, if you live in a city or an area that is sprayed with herbicides and pesticides or if you are on pharmaceutical medication, this pathway will need added support.

For efficient Phase 2 detoxification and production of bile, the liver cells require sulphur-containing amino acids such as taurine and cysteine, as well as several other nutrients such as those found in cruciferous and allium vegetables.

Please discuss your risk factors and possible need for additional support through diet and supplementation with your nutritional or healthcare practitioner.

How it works

Phase 2 detoxification is the second stage in processing toxic compounds for elimination. This phase involves the addition of chemical groups (such as glutathione, glycine or taurine) to the toxic intermediate compound that make it less toxic to body tissues and easier to excrete.

During Phase 2, the liver adds small chemical pieces onto the toxin in a process called conjugation, which effectively wraps it up safely, ready to be excreted via the colon and kidneys. These conjugation reactions include sulphation, glucuronidation, and glutathione conjugation, which are key processes to healthy detoxification along with Methylation, acetylation, and amino acid conjugation. The conjugation reaction (wrapping effect) neutralises toxins and the reactive intermediate compounds left over from Phase I.

Toxicity Questionnaire

Unhealthy

Sleep Questionnaire

Unhealthy

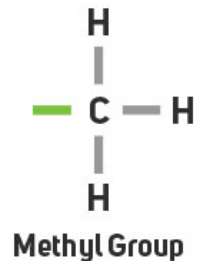
SNP	Result	Allele
CBS	+/-	AG
COMT	-/-	GG
GSTM1	Absent	
GSTT1	Absent	
MTHFR 677	+/+	TT
MTHFR 1298	+/-	AC
MTR	+/-	AG
MTRR	+/+	GG

Methylation

An introduction to Methylation

Methylation is a chemical reaction that occurs in every cell and tissue in our body by which methyl groups (CH₃) are added to other molecules. Efficient methylation is needed to keep our body and brain biochemistry in balance and contributes to numerous essential functions, including:

- Detoxification
- Gene expression
- Immune function
- DNA integrity
- Energy production
- Neurotransmitter balance
- Inflammation control

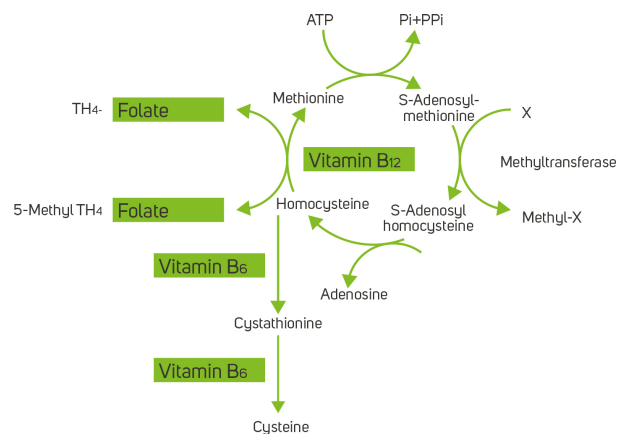


Environmental factors such as diet, chemical or drug exposure, sleep and stress are known to play a role in supporting or hampering methylation. For example, insufficient or deficiency in vitamin B6, B9, B12, methionine, betaine (TMG), choline and S-adenosylmethionine can hinder methylation.

Impact of methylation dysfunction

Methylation dysfunction (impairment) may contribute to health issues, including:

- Cardiovascular disease
- Diabetes
- Chronic fatigue syndrome
- Increased susceptibility to stress
- Free radical damage (premature ageing)
- Build-up of toxins, hormones and heavy metals
- Mood disorders presenting as depression or anxiety
- High histamine-related conditions such as hayfever and hives
- Autoimmune conditions such as MS, psoriasis and Rheumatoid Arthritis
- Oestrogen-related hormonal disorders, including PCOS, fibroids and PMS
- Pregnancy-related disorders such as unexplained miscarriage and infertility



Results: **Severe**

We have examined the methylation genes and relevant questionnaires and overall result indicates a potential compromised methylation function.

What to do

You will need to support your methylation pathway through eating more dark leafy green vegetables and possibly adding a supplement with methyl folate, B2, B6 and B12, depending on your overall risk factors as evaluated by your nutritional practitioner.

Please avoid supplements with folic acid in them if it is not the methyl form you need as your body will struggle to convert it. Folic acid also binds more firmly to the active enzyme sites that methyl folate would bind to thus exacerbating a deficiency.

Avoiding exposure to toxins is important. Look at your household cleaning supplies and cosmetics, try opt for more natural, preservative free, non toxic products.

Many factors other than diet can affect methylation such as inflammation, stress, and sleep.

- Always aim to get a good nights sleep. Many of the genes that are affected by lack of sleep are involved in processing stress and regulating our immune system (Methylation).
- Ensure that you are supporting yourself adequately in times of stress.
- If you are inflamed and in pain, please take the necessary steps to turn off that inflammatory response.

Toxicity Questionnaire

Unhealthy

Sleep Questionnaire

Unhealthy

SNP	Result	Allele
CBS	+/-	AG
COMT	-/-	GG
eNOS/NOS3	-/-	GG
MTHFR 1298	+/-	AC
MTHFR 677	+/+	TT
MTR	+/-	AG
MTRR	+/+	GG
VDR taq	-/-	CC

Oestrogen Dominance

Introduction to oestrogen dominance

Oestrogen is a predominantly female hormone produced mostly by the ovaries and the adrenal glands. It circulates throughout the body, binding to oestrogen receptors on cells. After oestrogen has performed its necessary function, any excess oestrogen is detoxed by the liver via a series of enzymes which prepare it for excretion through the bowel and kidneys.

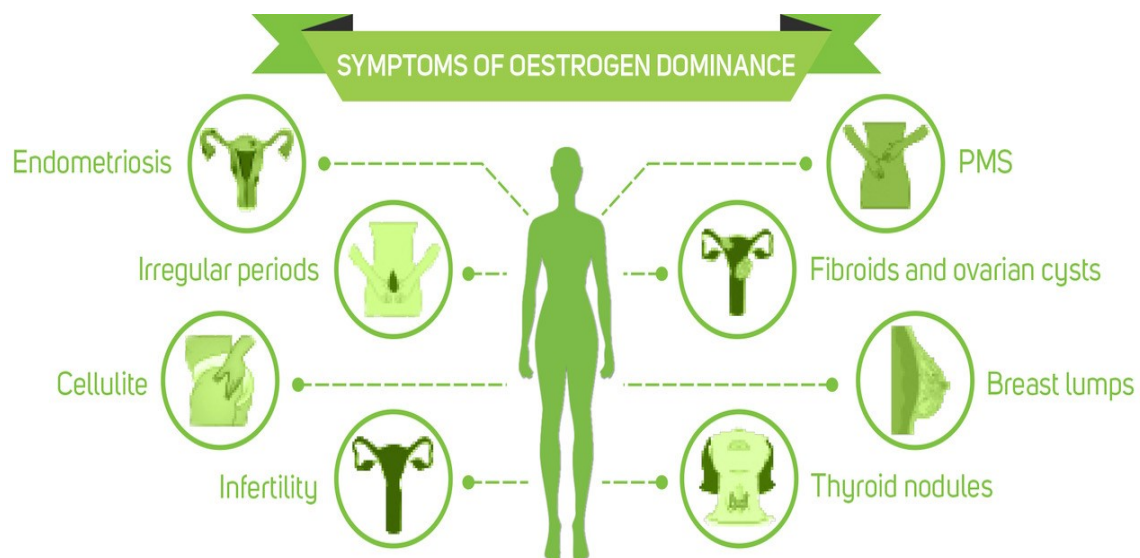
Healthy gut bacteria have also been shown to be beneficial in the elimination of oestrogen. If there are “bad” gut bugs, they may unconjugate or “unwrap” the conjugated oestrogen that is ready for elimination, which means it will be reabsorbed from the colon and sent back to the liver to be processed again.

Causes and symptoms

Some women suffer from having too much oestrogen in the body. This can increase cell growth in oestrogen sensitive tissues, such as in the uterus and breast and lead to fibroids, endometriosis, heavy periods and fibrocystic breast disease.

Ageing and high levels of physical, chemical and emotional stress are associated with the loss of progesterone in women and testosterone in men. When these key hormones are depleted it causes a state of oestrogen dominance.

Xenoestrogen's are either synthetic or natural chemical compounds that can mimic the action of oestrogen. They disrupt communication within the bodies endocrine/ hormone producing organs which contributes to oestrogen excess and blocks the effects of true oestrogen. This excessive bombardment of artificial hormones taxes the liver, which tries to break down the excess oestrogen to effectively eliminate it from the body. Over time, the hormone is eventually stored in fat cells. Chronic liver stress causes severe problems with toxicity, digestion, metabolism, and inflammation among other things.



Oestrogen

Result: **High Risk**

We have analysed your questionnaire and DNA results and your overall risk associated with oestrogen detoxification is high which means you may need to support detoxification of oestrogen through your diet, lifestyle and possibly some supplements.

What to do

You can improve oestrogen detoxification by making simple changes to the foods you eat. Firstly, cut out junk foods and processed foods. Reduce or remove alcohol, coffee and other caffeine containing drinks. When you're detoxifying, the foods that you eat are just as important as the things that you avoid. Concentrate on fruits and vegetables (the deeper the colour the better in terms of antioxidant content) and good quality protein.

The top foods to help with your oestrogen detoxification include:

- Brassica family vegetables: these include broccoli, cabbage and Brussels sprouts. The brassica vegetables can activate the rate at which the liver clears excess oestrogen.
- Dietary fibre, such as psyllium, can help bind up and eliminate oestrogen from the gut.
- Limonene from citrus fruits help to increase the liver's detoxification pathways.
- Probiotics from yoghurt or fermented foods, have been shown to positively affect bacteria in the colon, which increases the elimination of oestrogen.
- Flaxseeds are rich in lignans which are compounds that can exert a weak, oestrogenic effect in the body once converted by the bacteria in the bowel. These compounds can compete with the body's own oestrogen for uptake, therefore minimising the stronger effects of too much oestrogen.
- The herb rosemary improves detoxification of oestrogen.
- Organic, hormone free fish and meats support Phase 2 liver detoxification by supplying the essential amino acids needed for conjugation.

In addition, manage your weight as obesity can increase oestrogen levels in the body, as fatty tissue converts hormones such as androgens into oestrogen. You should also try to reduce your exposure to environmental "fake" oestrogen such as some plastics, cosmetics, glue and industrial chemicals.

Please discuss this further with your nutritional or healthcare practitioner.

Toxicity Questionnaire

Unhealthy

Oestrogen Questionnaire

Moderate

Cortisol Release

Healthy

SNP	Result	Allele
COMT	-/-	GG
CYP1A1	+/-	AG
CYP1B1	+/-	GT
MTHFR 677	+/+	TT
MnSOD	+/+	CC
GSTT1	Absent	
GSTM1	Absent	

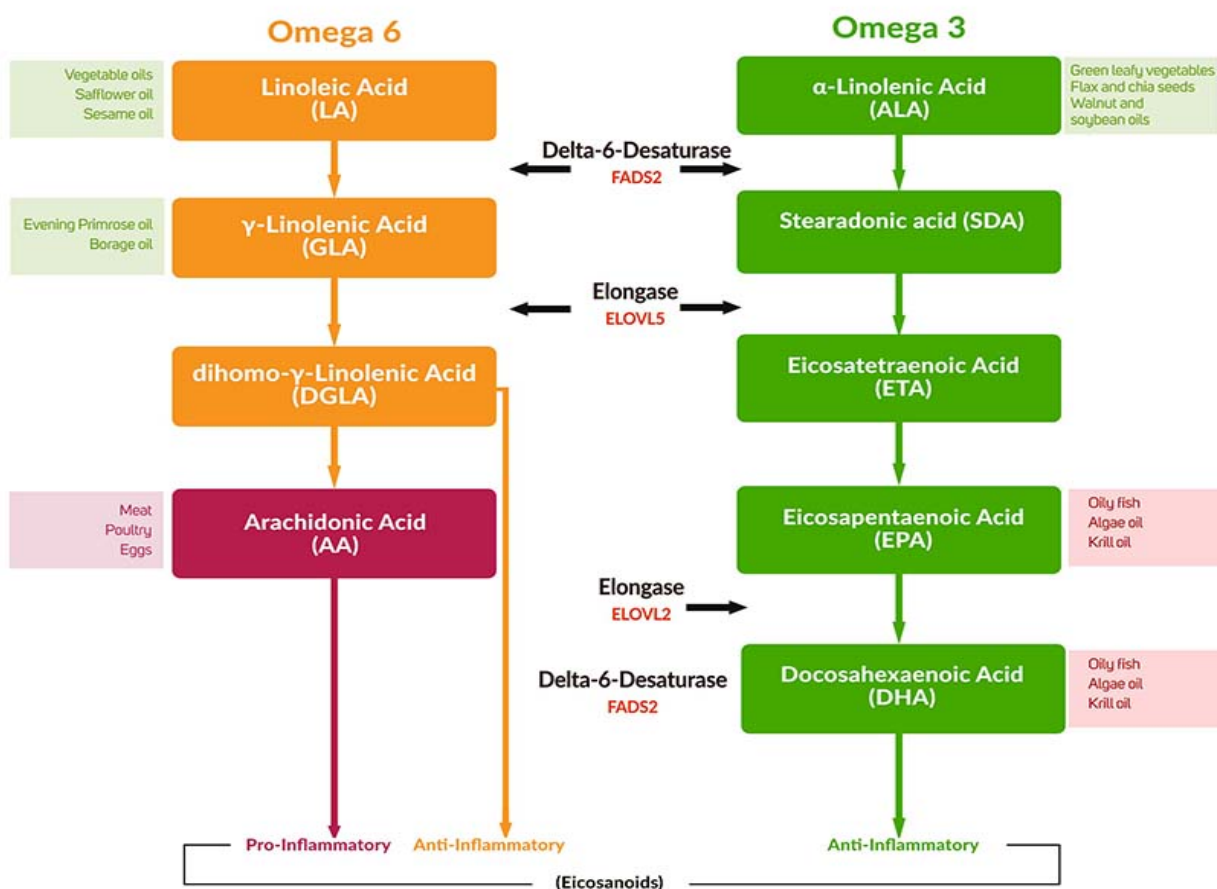
Essential Fatty Acids

PUFA Metabolism

The world has been obsessed with avoiding fats for decades. However, we now know that consuming healthy fats is crucial for optimal health, including supporting heart health and brain function. However, getting the right kind and balance through diet alone may be difficult for some people.

Dietary fatty acids are either saturated (SFAs), monounsaturated (MUFAs) or polyunsaturated (PUFAs). All fatty acids can be synthesised in the human body except for omega-3 and omega-6 that may only be obtained from dietary sources and are therefore known as "essential fatty acids" (EFAs). They contain the building blocks for other important PUFAs which have a range of important roles in human biology such as controlling inflammation, being components of cell membranes, acting as signalling molecules and regulating gene expression. As PUFAs have powerful effects on human biochemistry it is important to ensure that we have appropriate and balanced amounts in the body. Not only is this highly determined by diet and lifestyle but also by our genetic capacity to metabolise the essential fatty acids.

Essential Fatty Acid Pathways



Essential Fatty Acids

The two families of omega-3 and omega-6 are metabolised by the same enzymes and compete with each other for enzyme availability. This is why balancing omega-3 and omega-6 intake is so important in order to maintain the right PUFA levels in the body.

Key enzymes in this pathway are the Delta-5 (D5D) and Delta-6 desaturases (D6D) encoded by FADS1 and FADS2 genes respectively. Therefore, conversion of omega-3 (dependent on D5D enzyme) and omega-6 (dependent on D6D enzyme) suggests that individuals will require different amounts of dietary PUFAs depending on their genetic variants.

Essential Fatty Acids

Result: Impaired

Your overall results indicate an impaired essential fatty acid metabolic pathway.

FADS2 gene variant indicates a healthy functioning D6D enzyme. FADS1 gene variant indicates a reduced D5D enzyme activity. Research indicates that reduced D5D activity is related to inflammatory states such as obesity and insulin resistance and the T allele may contribute to this risk.

What to do?

To reduce this risk, ensure appropriate omega-3 intake (from oily fish, olive oil, avocados) and limit omega-6 intake (from eggs, poultry and most vegetable oils). Your questionnaire result indicates that you may not be getting an appropriate and well-balanced amount of omega-3 and omega-6 through your diet and may be showing symptoms of a deficiency or imbalance. Try to include at least two portions of oily fish (sustainably sourced, if possible) alongside green leafy vegetables in your diet weekly. Discuss any further supplementation (if necessary) with your nutritional or healthcare practitioner.

Essential Fatty Acids Questionnaire

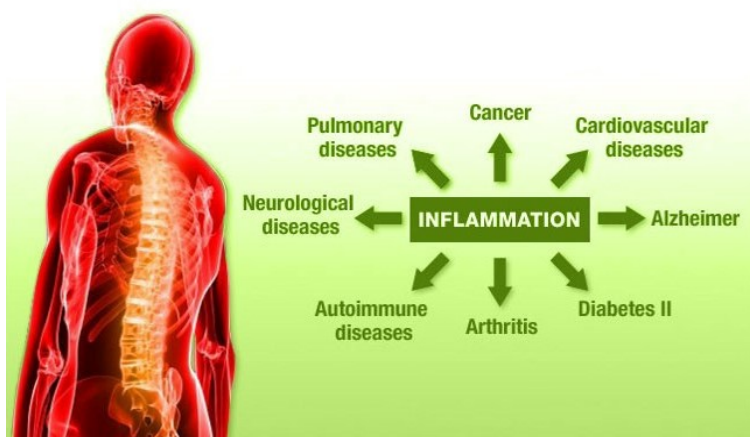
Moderate

SNP	Result	Allele
FADS1	+/+	TT
FADS2	-/-	CC

Inflammation

An introduction to inflammation

Inflammation is the body's natural response 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.



Many experts now see inflammation as arising from an immune system response that is out of control. 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. In a delicate balance of give-and-take, inflammation begins when pro-inflammatory hormones in your body call out for your white blood cells to come

and clear out infection and damaged tissue. These agents are matched by equally powerful, closely related anti-inflammatory compounds, which move in once the threat is neutralised to begin the healing process.

Acute inflammation isn't a problem. If the inflammatory response flares up and then dies down, there's nothing to worry about. But chronic inflammation can actually be a symptom that causes problems of its own.

Acute inflammation that fluctuates as needed 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. It's poised on high alert even when you are not in imminent danger. In some cases, what started as a healthy mechanism, like building scar tissue or swelling, just won't shut off. It may sound relatively harmless, but this situation can and often does lead to numerous serious and debilitating diseases. Since your immune system can become 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.

Inflammation

Result: High Risk

We have assessed your overall risk for inflammation and, according to the combined results of your inflammation questionnaire and your genetic profile, you are at high risk of prolonged systemic inflammation.

You should pay special attention to the foods that can both promote inflammation as well as those that can be anti inflammatory. If you have pain that needs to be addressed, there are nutritional supplements that can help to turn off the inflammation responses. You may also be more prone to systemic inflammation after an injury, so if you are injured, take time to heal properly before taxing the injured part of your body.

Inflammation Questionnaire

Unhealthy

SNP	Result	Allele
IL6R	+/+	CC
MTHFR 677	+/+	TT
TNF alpha	-/-	GG

What to do

To control inflammation, limit inflammatory stressors and load up on supporting foods and lifestyle habits!

- From a diet perspective, limit Omega-6 fats from seed oils, excess sugar, and refined carbs.
- Get enough Omega-3s from oily fish or flax and chia seeds.
- Find some way to manage psychological and social stress so it isn't preying on your mind.
- Sleep well, 7-8 hours preferably. Not sleeping well can turn on inflammatory responses.
- Take care of your gut flora.
- Get plenty of antioxidants from fresh fruits and vegetables.
- Many foods and spices are considered anti inflammatory, please discuss these with your nutritional or healthcare practitioner.

Lactose Intolerance

Lactose intolerance is the inability to digest lactose, the sugar found in milk and milk products. This condition is caused by the lack of an enzyme called lactase. The MCM6 gene has been shown to regulate lactase levels.

If you are lactose intolerant you should make sure that you are getting enough calcium from non-dairy or lactose-free sources. On the other hand, if you are not lactose intolerant, be aware that dairy products can be high in calories, fat, or both. You need to watch your intake accordingly or select low fat dairy products. People with a C/C genotype are "More Likely" to be lactose intolerant, while people with other genotypes are "Less Likely". This variant has been found to be associated with lactose intolerance in Caucasians, while other variants might play an important role in other ethnicities, including Africans and Asians

Result: Low Risk

You do not have the genetic variant for lactose intolerance. However, if you are experiencing gastrointestinal or digestive problems, please consult your nutritional or healthcare practitioner.

SNP	Result	Allele
MCM6	-/-	TT

Caffeine Metaboliser

Caffeine is one of the most widely consumed stimulants in the world, and it is found in the leaves and seeds of many plants. It is also produced artificially and added to some foods. Caffeine is found in tea, coffee, chocolate, many soft drinks and energy drinks, as well as in some pain relievers and other over-the-counter medications. Caffeine is metabolised by a liver enzyme, which is encoded by the CYP1A2 gene. Variation at a marker in the CYP1A2 gene results in different levels of enzyme activity, and thus, different metabolism rates for caffeine.

Therefore, the two possible genetic results in this report are "Fast Metaboliser" and "Slow Metaboliser". If you are a "Slow Metaboliser", then caffeine may have longer lasting stimulant effects for you. In addition to genetics, your body's ability to metabolise caffeine also depends on other lifestyle factors. For example, how much coffee you drink, whether you smoke or whether you take hormonal birth control, may also affect your ability to metabolise caffeine. Because these and other lifestyle factors may both increase or decrease your caffeine metabolism, the most sensible advice is to make lifestyle choices that have the maximum benefit for your overall health.

Result: Severe

You are likely a slow metaboliser of caffeine and might benefit from limiting your caffeine intake.

SNP	Result	Allele
CYP1A2	+/+	CC

Glutathione Need

Glutathione is one of the body's most powerful cleansers and detoxifying systems and found in the brain, the liver and most cells in the body. Glutathione S-transferase is the enzyme that brings glutathione and the toxins together to remove them from the system.

If this glutathione enzyme does not work, there will tend to be an accumulation of unstable compounds. This can contribute to the toxic symptoms of fatigue, depression, allergy, asthma, infertility, obesity and hormonal upsets. Glutathione works with Vitamin C to reduce damage caused by free radicals. Adding colourful fruit and vegetables, specifically cruciferous (broccoli and cauliflower) and allium vegetables (onion and garlic) to your diet can assist this detoxification system in removing harmful substances from the body.

Result: High

You may be deficient in glutathione and therefore need additional support in the form of natural foods like cruciferous and allium vegetables, and if necessary, supplementing with glutathione or N-acetyl Cysteine, a precursor to glutathione. Please discuss these options with your nutritional or healthcare practitioner before starting any supplements.

SNP	Result
GSTT1	Absent
GSTM1	Absent

Vitamin D Requirements

Vitamin D is important for the absorption and utilisation of calcium, which is beneficial for maintaining good bone health. Vitamin D deficiency has been linked to increase risk of osteoporosis, especially if you consume more than two caffeinated beverages a day. Vitamin D deficiency has also been linked to issues with blood sugar regulation and the regulation of the neurotransmitter dopamine.

You can increase your Vitamin D levels naturally by getting just 15 minutes of sunshine on your whole body per day, but considering that getting sunlight may not be an option, food sources include salmon, trout, mackerel, tuna, eel, portobello mushrooms, egg yolks, beef liver and cod liver oil. Furthermore you can take a Vitamin D3 supplement but please discuss with your nutritional or healthcare professional before starting.

Result: Good

You do not have increased need for Vitamin D.

SNP	Result	Allele
VDRtaq	-/-	CC
VDRfok	-/-	CC

Folate Requirements

These genes are responsible for making the MTHF reductase enzyme that converts folic acid into the biologically active folate. When you have compromised genes your ability to make the active form of folate is reduced. The best lifestyle modification that supports these genetic variants is the inclusion of more green leafy vegetables in your daily diet.

Another way to support this gene is through supplementing with a combination of methylfolate (L-5MTHF) and vitamin B12, along with all of the co-factors, such as magnesium, zinc, and the other B vitamins. Please discuss these options with your nutritional or healthcare professional before starting any supplements.

Folate is found in many foods, such as green leafy vegetables like chard or kale, as well as beans, lentils, fruits and fortified grains. This nutrient plays a role in protein metabolism, as well as DNA repair. Folate can lower the blood level of homocysteine, a substance linked to cardiovascular disease at high levels. Diets rich in folate have been associated with reduced risk of cardiovascular disease. Folate is particularly important early in pregnancy for preventing some birth defects.

Result: Moderate

Your overall need for folate is slightly increased and needs additional support in the form of consuming enough dark leafy green vegetables daily.

SNP	Result	Allele
COMT	-/-	GG
MTHFR 677	+/+	TT
MTHFR 1298	+/-	AC

Vitamin B Requirements

Vitamin B12 plays an important role in how your brain and nervous system function. It helps to keep red blood cells healthy and is a critical component for synthesis and regulation of your DNA.

Vitamin B12 is found naturally in foods of animal origin including meat, fish, poultry, eggs and milk products. A healthy diet will typically provide sufficient B12, although vegetarians, vegans, older people, and those with problems absorbing B12 due to digestive system disorders may be deficient. You should ensure that you are eating a healthy diet and discuss this result with your nutritional or healthcare professional.

Result: High

You have an increased need for B vitamins (such as B6 and B12). Focus on obtaining your daily B vitamin requirements from natural foods first, then discuss supplementing with your nutritional or healthcare practitioner, if necessary.

SNP	Result	Allele
MTR	+/-	AG
MTRR	+/+	GG

Iron Overload

Iron is an essential nutrient found in many foods. Iron carries oxygen to all parts of the body. Normally, humans absorb about 8-10% of the iron in foods that they eat but a person with hemochromatosis (too much iron) can absorb four times more iron than normal. The genes associated with hemochromatosis are HFE C282Y and HFE H63D. Please note that having the genetic variants does not mean that you will have a problem with your iron level; other things such as environment, diet, and other genes may come into play. If you do have the genetic variants or concerned about your iron levels, then please discuss with your healthcare professional.

Result: Moderate

You may be at risk for storing excess iron. Please consult with your nutritional or healthcare practitioner before taking any supplements that contain iron.

SNP	Result	Allele
HFE H63D	+/-	CG
HFE C282Y	-/-	GG

Antioxidant Requirements

The common denominator in the process of ageing and its associated diseases is called oxidative damage or stress. Oxidative stress is what happens when your body does not have enough antioxidants to neutralise free radicals, the unstable molecules that react with other substances in your body to damage cells or create abnormal ones. This cellular damage can trigger inflammation, arterial damage, and ageing. Common diseases are becoming more associated with a shortage of antioxidant nutrients in the body.

Antioxidants helps to reduce oxidative stress. Genetics and environmental factors contribute to oxidative stress. Antioxidants are found naturally in the body in the form of enzymes but certain genetic variants can impact enzyme activity. Therefore, some people will need to increase their intake of dietary antioxidants found in a natural foods including colourful fruits and vegetables, and possibly supplement.

Result: Severe

You may benefit from eating more antioxidant rich foods such as colourful fruit and vegetables.

SNP	Result	Allele
MnSOD	+/+	CC
NQO1	+/-	CT
eNOS	-/-	GG
GSTT1	Absent	
GSTM1	Absent	

- **eNOS** is responsible for maintaining the cardiovascular system.
- **MnSOD** detoxifies free radical O₂ which is generated by mitochondrial respiration
- Glutathione-S-transferase (**GST**) is an antioxidant and is involved in the clearance of products of oxidative stress
- **NQO1** is a cytosolic flavoenzyme expressed in epithelial and endothelial tissue acting as an antioxidant

If you have the genetic variants and are not consuming enough antioxidants, or if you are inflamed, then you may be more susceptible to oxidation, hypertension and cardiovascular problems. This can be supported through consuming antioxidant rich vegetables and fruits and nutrients.

Magnesium Requirements

Magnesium is a nutrient that the body needs to stay healthy. Magnesium is important for many processes in the body, including regulating muscle and nerve function, blood sugar levels, and blood pressure and making protein, bone, and DNA.

Catechol-O-methyltransferase (COMT) is an enzyme that breaks down catecholamines, which include what we think of as adrenaline (epinephrine and norepinephrine). When we are under stress, adrenaline levels rise causing fear and anxiety. A person with COMT mutations will be less able to remove adrenaline from their body and more likely to experience these stressful feelings. Dopamine is also a catecholamine that is broken down by COMT, and if that function is decreased, elevated dopamine levels can result, affecting mood as well as focus.

Result: **Good**

You do not have additional need for magnesium. Getting it through natural foods should be adequate to support you.

SNP	Result	Allele
COMT	-/-	GG

Omegas

According to your genetic profile, you have an increased need for dietary omega-3 and a decreased need for omega-6. High omega-6 intake in relation to omega-3 may lead to inflammatory states such as obesity and insulin resistance. To prevent that, ensure appropriate intake of omega-3 from oily fish (at least twice a week), olive oil, seeds and limit dietary sources of omega-6 from poultry, eggs and most vegetable oils to prevent imbalance or deficiency potentially leading to inflammation, skin problems, fatigue, mood swings. Supplement with good quality EPA and DHA, if necessary. Discuss this with your nutritional or healthcare professional.

Result: **Moderate**

Based on the genes we tested, you may benefit from increasing dietary sources of omega-3.

SNP	Result	Allele
FADS1	+/+	TT
FADS2	-/-	CC



Low Toxin Dietary Guidelines

Your genetic profile and toxicity questionnaire results suggests that you struggle with clearing toxins from your system. Typical toxins that we can remove to lessen this load are alcohol, sugar and any processed foods i.e. any foods with high total bad fat, especially hydrogenated, trans fat like deep fried vegetable oils. You also need to reduce oxidative stress by increasing your intake of organic (pesticide free) vegetables.

Removing toxins will greatly help in your fight against poor health and weight gain. We recommend you try to follow a low toxin diet for 30 days. Thereafter, we recommend you redo your toxicity questionnaire to see if your toxin overload has decreased.

Please consult with your nutritional therapist or healthcare provider who will help to create a personalised plan.

Drink water

Drink clean, filtered water daily. Eight glasses of 250ml can be sipped throughout the day.

Eating and drinking

Eat and drink sensibly. The goal of this dietary approach is to remove some of the common foods that aggravate the liver detoxification system. Remove the following in your daily diet:

- ✗ All processed foods; try eat food in its most natural form and cook all meals from scratch (real food)
- ✗ All bread and grain products i.e. cereals, biscuits
- ✗ All sugar. Read labels carefully to see if added sugars are included
- ✗ All bad fats. Deep fried foods and processed foods will have high levels of bad fats
- ✗ All fruits and vegetables with pesticides (refer to Low Toxin Food Guide)
- ✗ Alcohol
- ✗ Coffee

Try and include some of the following in your daily diet:

- ✓ Low sugar fruits like organic berries, apples and pears
- ✓ Lots of organic vegetables
- ✓ Good fats like nuts, seeds and avocados
- ✓ Try to eat free range, organic and grass fed products.

Reminder: You need to repeat your questionnaire after 30 days as your epigenetic profile may have improved so that you can move on to a more relaxed dietary guideline.

Low Sugar Healthy Fat Guidelines

Your overall results show that you may develop a sensitivity to some fats and refined carbohydrates. You can lower your risk through adopting a low sugar healthy fat eating lifestyle with exercise.

The information below will provide you with some dietary guidelines, which you can adapt to suit your personal preferences. Please discuss with your nutritional or healthcare practitioner.

Unhealthy fat avoidance

The goal of this dietary approach is to moderate the saturated fats and eliminate trans fats and to choose healthier oils for your daily consumption. You will benefit from eating the healthy fats and should include them with every meal.

We recommend you follow a diet plan to eliminate the "bad" fats from your foods.

- ✗ Deep fried foods (damaged fats)
- ✗ Margarines (trans fats)
- ✗ Grain fed red meats (saturated fats)

You may also need to limit dairy products (cheeses, creams, yoghurts, milk).

Please note that it is still very important for you to consume healthy fats. The healthy fats provide essential fatty acids that the body can't make itself. These fats are essential for health as they make up 90% of the brain as well as being the main component of healthy cell membranes in every cell in our body. This is essential for optimal health. You should try to include the following healthy fats:

- ✓ Fish oils, avocados, grass fed butter*, unrefined extra virgin olive oil and coconut oil* as well as nuts and seeds
- ✓ Omega-3 essential fatty acids found in oily fish such as salmon, sardines and mackerel
- ✓ Omega-6 fatty acids found in nuts, seeds and olive oil

* Limit your grass fed butter and coconut oil to 7g per day (condiment size served in a restaurant)

Sugar avoidance

You should aim to eliminate the unhealthy added sugar from your diet. The World Health Organisation recommends that women consume no more than 6 teaspoons (25g) of added sugar a day and men, 9 teaspoons (36g). This is less than what you find in an average can of fizzy drink. It is less than what you find in a bowl of sugary cereal and it is about the same as a glass of fruit juice.

You should start to read the labels of everything that you eat and drink to see just how much added sugar you are consuming. For example, if the label of a fruit juice says 10g/100ml of sugar and you are drinking a glass of juice (250ml) then you have just consumed 25g, the entire daily WHO recommended allowance of sugar for a female.

Below is a list of typical high-sugar foods to avoid:

- ✗ All fizzy and sugary drinks including diet drinks
- ✗ All dried fruit
- ✗ Pure or concentrated fruit juice
- ✗ Cakes, biscuits, muesli, granola, muffins, cereal bars and sweets
- ✗ Breakfast cereals, where sugar is added to the ingredient
- ✗ Sugars: sucrose, maltose, dextrose, corn syrup, glucose syrup, agave nectar, honey, jam golden syrup, maple syrup, treacle and molasses
- ✗ Ready-made sauces like ketchup, mayonnaise and chutney
- ✗ Alcohol. If you are drinking spirits then it is the mixer (fizzy drink) that is generally high in sugar.
- ✗ Soda is your only option as a mixer. Avoid dessert wine, cider and liquors. Gin and Vodka are low in sugar. Dry wine is low in sugar.

Sweeteners

Avoid all artificial sweeteners. Some are toxic and some are natural, but they all stimulate the brain to crave sugars later in the day. If you are getting off sugar, then you need to get off sweeteners as well. Saccharin, sucralose and aspartamine are all chemical sweeteners and have been linked to cancers and fatigued brain responses. Stevia and xylitol are natural sweeteners, but may still leave you craving more sugar later.

Fruit

Fruit has sugar but also has fibre so the sugar is released slowly. Try to avoid fruit in the few weeks as it will stimulate your sugar cravings. Always, without exception, stay clear of dried fruit and fruit juices.

After this period you can re-introduce fruits but follow the recommended servings per day.



Cardiovascular exercise (endurance or aerobic)

Cardiovascular refers to the ability of your heart, lungs and organs to consume, transport and utilise oxygen. The maximum volume of oxygen your body can consume and use is your VO2max. When you exercise regularly, you can increase your cardiovascular fitness as your heart becomes more efficient at pumping blood and oxygen to the body and the body becomes more efficient at using the oxygen.

Cardiovascular exercise is endurance or aerobic and simply means that you are involved in an activity that raises your heart rate to a level that you are working, but can still talk i.e. in your "target heart rate zone".

You need cardiovascular exercise if you want to get your weight under control and get your stress to a tolerable level.

Getting started

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

Monitoring your exercise intensity is the best way to get the most out of your cardio workouts. If you don't know what you like, try something and if it does not work for you then try something else. Just about any activity will do, as long as it gets your heart rate into your target heart rate zone.

For example:

- Outdoors - running, cycling, hiking and walking, using a trampoline, skipping (using a jump rope)
- Gym - swimming, stationary bike, elliptical trainers, treadmills, rowing machines and stair master
- Other - dancing, climbing up stairs and all kinds of aerobic exercise, which can be done in a aerobic class or even following a DVD.

Strength training

(anaerobic or resistance or body weight exercises)

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.

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.

Disclaimer

The information provided in this report is not a diagnosis and does not represent medical advice and is not intended to treat, diagnose or cure any medical condition or disease. If you have any medical condition you should not change or stop your medications or medical care without consulting your medical professional. The information in this report is not intended for children or for women who are pregnant or nursing.

This report is based on your unique genetic results obtained by analysing the DNA from the DNA swab you provided, your answers to the online questionnaires and the information you provided in your personal profile. 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 conditions 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 follow an eating plan or to take nutritional supplements;
- You do not have any food allergies; and
- There is no other reason why you should not follow the assertions or suggestions in the report.

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 always consult with your nutritional or medical practitioner.

You are at all times responsible for any actions you take, or do not take, as consequence of the assertions or recommendation in this report, and you will hold My DNA Health Limited, its officers, employees and representatives harmless against all losses, costs, expenses and physical wellbeing in this regard. Before acting on any of the assertions or suggestions in this 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 practitioner@mydnahealth.co.uk.