

# dnacore

## Welcome

### to your personalised nutrition and fitness report

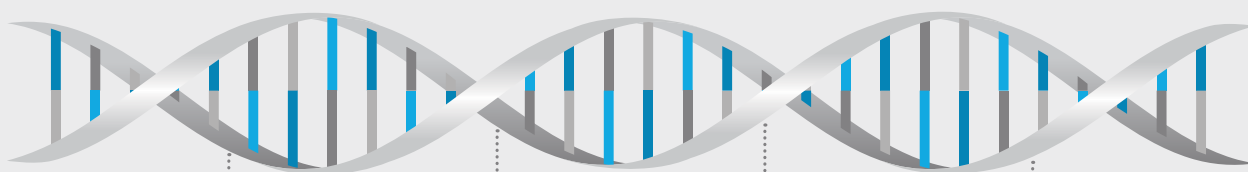
Date of birth:

Date reported:

Sample number:

Referring practitioner:

DNA Core is designed to guide you on your journey to live a healthier and more active life, and help you reach your weight management and health goals.



Biological  
processes



Nutrition



Weight  
management



Exercise  
response

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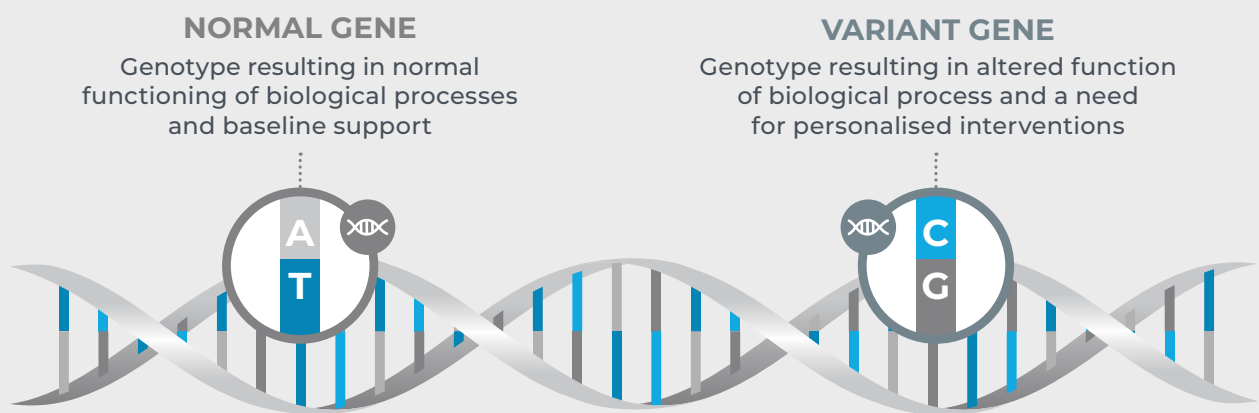


# The science behind DNA Core

## Genetics and personalised medicine

Genes are segments of DNA that contain the instructions your body needs to make each of the many thousands of proteins required for life. Each gene is comprised of thousands of combinations of “letters” (called bases) which make up your genetic code. The code gives the instructions to make the proteins required for proper development and function.

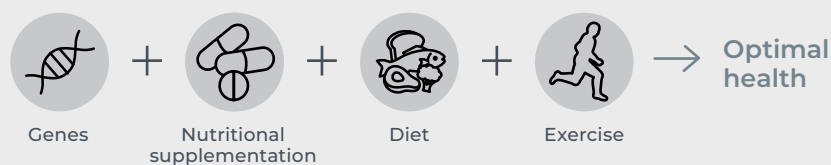
Genetic variations can affect the expression of a gene, thereby affecting metabolic processes that are important for maintaining a state of health. Knowledge of these variations offers a powerful advantage, enabling personalised nutritional, lifestyle, and exercise recommendations aimed at optimising health, weight management and performance.



## How does understanding my DNA help me on my journey to achieve my core health goals?

Our cells are complex machines that perform critical, biological processes. These processes, or pathways, have specific requirements to function. Knowledge of the genetic variations you carry can help to determine which diet, lifestyle interventions and nutrients you may need to optimise your health.

The personalised recommendations in this report are grounded in reliable, valid, scientific evidence, that when used in conjunction with a healthy diet, exercise and lifestyle plan, will help you make informed decisions regarding your healthcare journey.

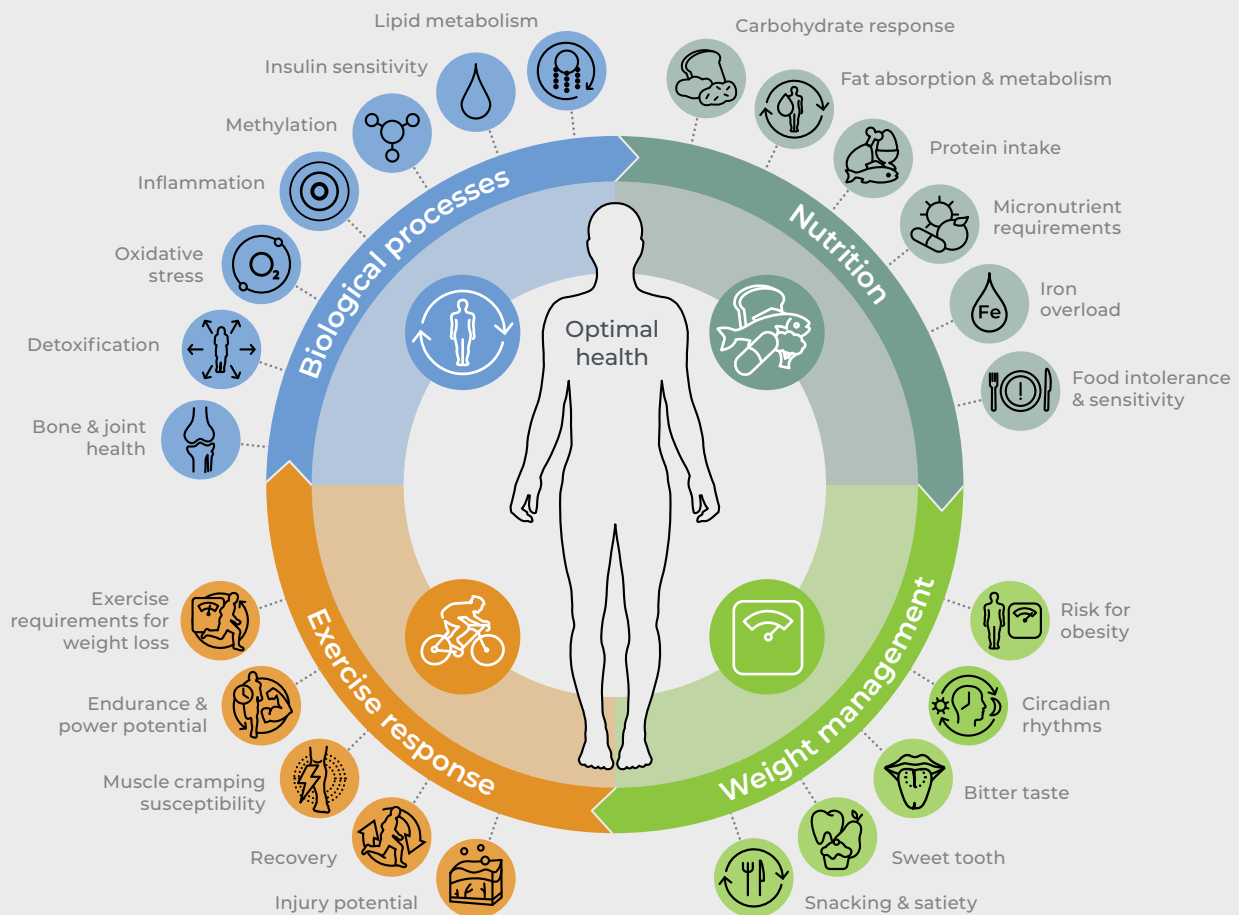


Scan to watch “Introduction to genetics” for more information on the above.

# An overview of DNA Core

DNA Core is your handy reference guide to weight management, exercise responsiveness, nutrient requirements, and a host of other factors that combine to help you reach your health goals. Your genes never change, so you can refer to this report at any time.

## DNA CORE REPORTS ON FOUR KEY AREAS:



## How to read your report

We have analysed your DNA and identified specific genetic variations that make you who you are. These variations are not "good" or "bad" but rather give insights into how you can better support gene expression for optimal cellular functioning. Based on your specific genetic variations, you might need interventions in one or more of the key biological areas to enhance your overall health.

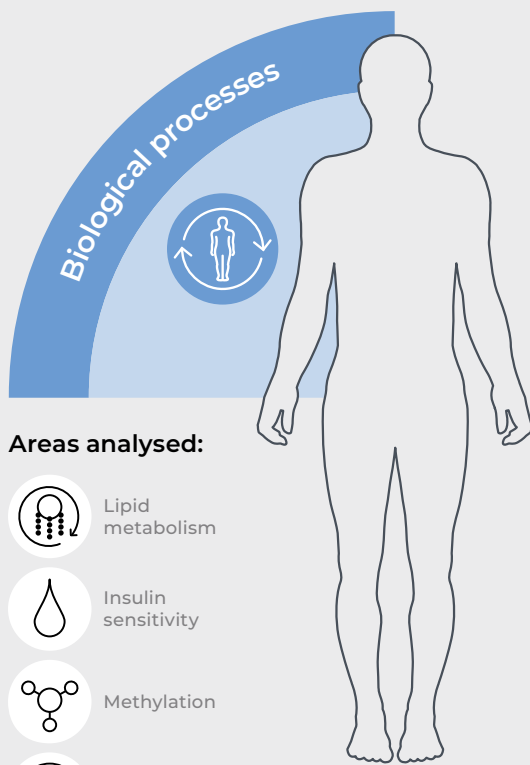
The report is structured and colour-coded based on the core areas shown above. The biological processes that have been identified as priority areas i.e. requiring additional support, are highlighted on the summary pages that follow. This is followed by a summary page of practical recommendations to support your core priority areas. At the bottom of each summary page is a QR code which will give you access to additional information. You will then be able to view genotype results in the technical section of the report, followed by detailed information and recommendations for each of your priority areas.

In the appendix, you will find fact sheets for your recommended diet type for weight management, exercise recommendation tools, as well as insights into personalised nutraceutical intake.








# Summary of core areas

## Your biological processes summary




The biological processes that have been identified as priority areas which require additional support, are highlighted in blue below. The greyed-out results indicate a normal or typical outcome. To find out more about each area analysed, scan the QR code on the bottom of the page.




### Areas analysed:

-  Lipid metabolism
-  Insulin sensitivity
-  Methylation
-  Inflammation
-  Oxidative stress
-  Detoxification
-  Bone and joint health


### Your lipid metabolism results:

-  **Typical risk for high triglycerides**  
Lower triglyceride benefits heart health (triglycerides = energy stored as fats in the blood)
-  **Typical risk for dyslipidaemia**  
Regular metabolism of "good" & "bad" cholesterol
-  **Elevated risk for lipid oxidation**  
Altered antioxidant enzyme activity increasing risk for blood vessel damage


### Your insulin sensitivity:

-  **Typical risk for type 2 diabetes**  
Associated with appropriate insulin response to food intake

### Your methylation results:

-  **Elevated risk for raised homocysteine levels**  
Raised homocysteine levels negatively impacts heart & mental health, mood, ageing & reproduction



### Your inflammation results:

-  **Elevated risk for chronic inflammation**  
Negatively impacts heart & mental health, weight management, & recovery

### Your oxidative stress results:

-  **Suboptimal function of antioxidant enzymes**  
High risk of oxidative stress, cell damage & premature ageing

### Your detoxification results:

-  **Accelerated function of phase I detoxification enzymes**  
Heightened response to environmental pollutants & risk of cell damage
-  **Reduced function of phase II detoxification enzymes**  
Poor ability to clear toxins & metabolites from the body with high risk of cell damage

### Your bone and joint health results:

-  **Typical risk for low bone mineral density**  
Optimising bone health reduces risk for osteoporosis & fractures

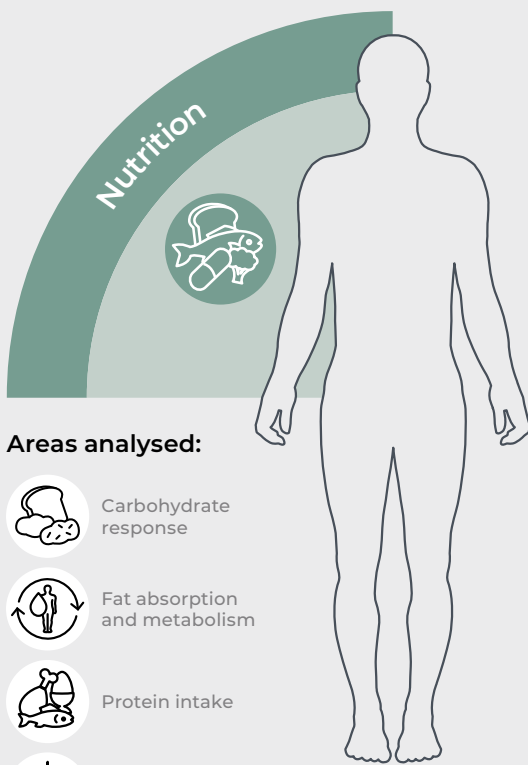


Scan for definitions and additional information about each of the areas above






# Summary of core areas

## Your nutrition summary: Nutrient requirements







The areas that have been identified as priority areas which require additional support, are highlighted in green below. The greyed-out results indicate a normal or typical outcome. To find out more about each area analysed, scan the QR code on the bottom of the page.



### Areas analysed:

-  Carbohydrate response
-  Fat absorption and metabolism
-  Protein intake
-  Micronutrient requirements
-  Micronutrient requirements

### Your macronutrient requirements:

-  **High barrier to weight loss with carbohydrate intake**  
You may experience weight loss-resistance when eating a carbohydrate-rich diet
-  **High barrier to weight loss with higher saturated fat intake**  
You may experience weight loss-resistance when eating too many high saturated fat foods
-  **Typical benefit** for weight management when eating standard recommendations of **mono-unsaturated fats**
-  **Enhanced benefit** for health when eating more **polyunsaturated fats** especially omega 3's (fatty fish)
-  **Typical benefit for weight management** when eating standard recommendations for protein
-  **You are at not risk of hereditary haemochromatosis**  
Normal regulation of iron turnover

### Your micronutrient requirements:

-  **Vitamin A: Increased**  
Susceptible to insufficiency: compromised immunity, poor skin & eye health
-  **Vitamin B2: Typical**  
Efficient utilisation of the essential vitamin
-  **Vitamin B6: Increased**  
Susceptible to insufficiency: negatively impacts heart & mental health, immunity & energy metabolism
-  **Folate: Increased**  
Susceptible to insufficiency: negatively impacts heart, mental health & DNA health, with fatigue
-  **Vitamin B12: Increased**  
Susceptible to insufficiency: anaemia, fatigue, poor heart health & cognitive function
-  **Choline: Typical**  
Efficient utilisation of the essential nutrient
-  **Vitamin C: Increased**  
Susceptible to insufficiency: Important for immunity, skin & joint health & wound healing
-  **Vitamin D: Increased**  
Susceptible to insufficiency: essential in growth & development, immunity, mental health & skeletal health
-  **Calcium: Increased**  
Susceptible to insufficiency: essential in growth & development & skeletal health

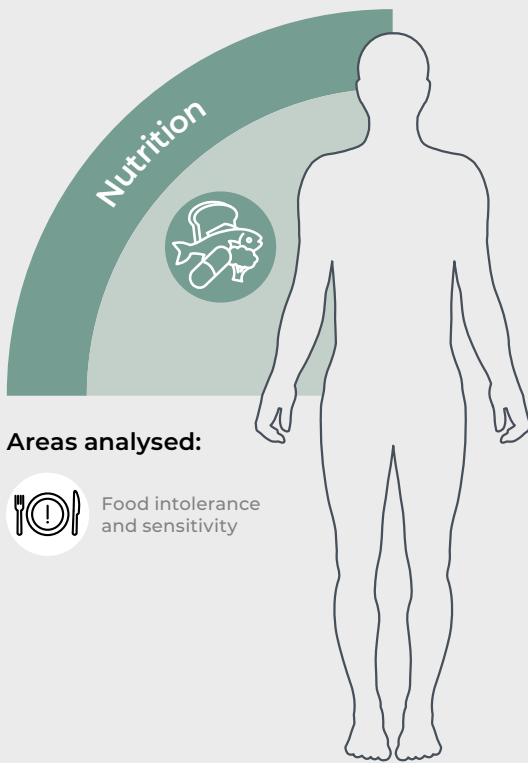


Scan for definitions and additional information about each of the areas above

# Summary of core areas

## Your nutrition summary: Food intolerance and sensitivity

The areas that have been identified as priority areas which require additional support, are highlighted in green below. The greyed-out results indicate a normal or typical outcome. To find out more about each area analysed, scan the QR code on the bottom of the page.



### Lactose intolerance:



**You are lactose intolerant**

You likely cannot break down lactose, & may experience undesired abdominal symptoms

### Your risk for coeliac disease (gluten intolerance):



**You are at increased risk for coeliac disease**

You may experience adverse symptoms with gluten intake

### Your alcohol metabolism:



**Typical alcohol metabolism**

No significant increased risk of liver disease with moderate alcohol consumption

### Your food sensitivities:



**You are caffeine sensitive**

Caffeine may negatively affect your sleep, anxiety, heart & bone health



**You are salt sensitive**

Eating salt & salty foods will increase blood pressure

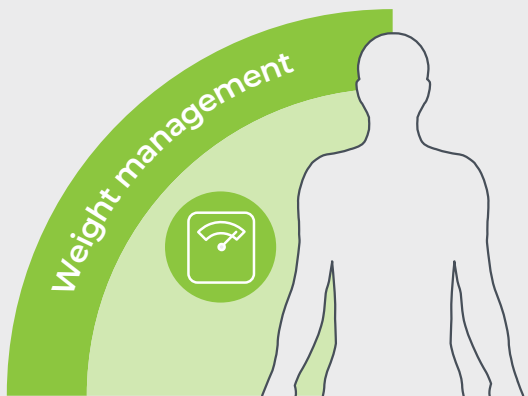


Scan for definitions and additional information about each of the areas above






# Summary of core areas

## Your weight management summary


The areas that have been identified as priority areas which require additional support, are highlighted in green below. The greyed-out results indicate a normal or typical outcome. To find out more about each area analysed, scan the QR code on the bottom of the page.




### Areas analysed:

-  Risk for obesity
-  Circadian rhythms
-  Bitter taste
-  Sweet tooth
-  Snacking & satiety




### Your weight and body composition:

-  **High risk for obesity & weight loss resistance**  
You may lose weight slowly, struggle to maintain weight loss & gain weight more easily

### Circadian rhythm influence on your weight and exercise performance:

-  **You are more likely to be a morning person**  
You may prefer waking up early, getting to bed early & require less effort when exercising earlier in the day

### Your eating behaviours:

-  **Increased taste sensitivity to bitter foods**  
You may have an aversion to vegetables with a bitter taste
-  **Enhanced "sweet tooth"**  
You are more likely to crave high quantities of sweet foods
-  **Elevated snacking & satiety behaviour**  
You may feel less satisfied after meals and be more likely to snack often



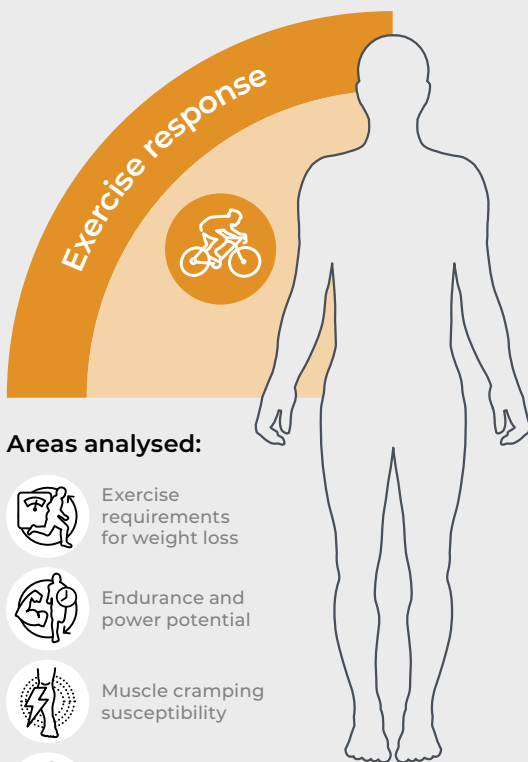
Scan for definitions and additional information about each of the areas above



# Summary of core areas

## Your exercise response summary

The areas that have been identified as priority areas which require additional support, are highlighted in green below. The greyed-out results indicate a normal or typical outcome. To find out more about each area analysed, scan the QR code on the bottom of the page.



### Areas analysed:

- Exercise requirements for weight loss
- Endurance and power potential
- Muscle cramping susceptibility
- Recovery
- Injury potential

### Your exercise requirements for weight loss:

**You require a MODERATE MET HOURS exercise plan** to mobilise fat stores & manage weight in response to exercise

### Your endurance and power potential:

**Mixed athletic potential**  
A higher genetic potential for mixed endurance & power-based exercise

### Your muscle cramping susceptibility:

**Elevated cramping susceptibility**  
You are more likely to suffer from muscle cramps

### Your recovery from exercise:

**Typical recovery**  
You tend to recover quickly from strenuous exercise

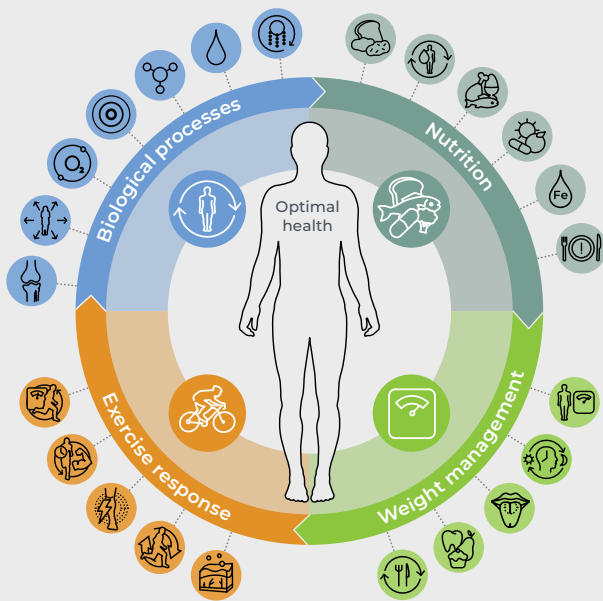
### Your risk for soft tissue injuries:

**Typical injury risk**  
Typical ability to rebuild collagen with strenuous activity



Scan for definitions and additional information about each of the areas above

# Summary of recommendations



## Biological processes

### Support lipid metabolism:

- Nutrients: Omega 3 fatty acids (high DHA), soluble fibre, plant sterols, antioxidants
- Focus foods: Fatty fish (mackerel), plant-based diet: eat the rainbow
- Moderate intensity exercise daily
- Manage stress, manage weight, no smoking, no alcohol

### Support insulin sensitivity:

- Nutrients: Good quality fats, fibre, protein
- Focus foods: High-fibre, nutrient-dense wholefoods, limiting carbohydrate-rich foods
- Maintain a healthy weight, regular meal-timing with portion control
- Exercise regularly & manage stress

### Support methylation:

- Nutrients: Vitamin B complex (with methylfolate), choline, magnesium, zinc
- Focus foods: Green leafy vegetables, nuts & seeds, lentils, eggs
- Manage stress & avoid alcohol

### Support inflammation:

- Nutrients: Omega 3 fatty acids, anthocyanins, probiotics
- Focus foods: Fatty fish, blueberries, fermented foods, ginger
- Follow an anti-inflammatory diet, avoid alcohol & smoking
- Manage stress, support good gut health & get adequate sleep

### Support antioxidant status:

- Nutrients: Vitamins C & E, selenium, zinc, copper, resveratrol, quercetin
- Focus foods: Colourful fruits (citrus, apples, berries), nuts, seeds, leafy greens, lean meat
- Exercise at moderate intensity, daily
- Manage stress, limit toxin exposure (pollutants, chemicals etc.)

### Support detoxification:

- Nutrients: Sulforaphane, N-Acetylcysteine (NAC), milk thistle
- Focus foods: Cruciferous vegetables (broccoli, cabbage, kale), beets, carrots, artichokes, garlic, onions
- Minimise toxin exposure (smoking, alcohol, personal care products), manage stress, support gut health

### Support bone health:

- Nutrients: Vitamin D & K, calcium, magnesium
- Focus foods: Dairy, fatty fish, nuts, leafy greens, tofu
- Do load bearing exercise
- Limit caffeine to less than 3 cups of coffee per day



## Nutrition

### Your recommended diet: Low carbohydrate diet

- Plant based, low in red meat & saturated fat & rich in fatty fish
- Avoid all major carbohydrate food sources as part of a low carbohydrate diet
- Limit saturated fat food sources (e.g. fat on meat) to less than 7% total calorie intake
- Increase intake of mono-unsaturated fat food sources (e.g. olive oil) to make up 14% of total calorie consumption.
- Increase intake of polyunsaturated fat food sources: walnuts, flax & fatty fish
- Avoid fatty & iron-rich foods. Blood test: transferrin saturation

### Your micronutrient requirements:

- Avoid insufficiency with nutrient-rich foods & supplementation

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Vitamin A  | <input checked="" type="checkbox"/> Folate      | <input checked="" type="checkbox"/> Vitamin C     |
| <input checked="" type="checkbox"/> Vitamin B2 | <input checked="" type="checkbox"/> Vitamin B12 | <input checked="" type="checkbox"/> Vitamin D     |
| <input checked="" type="checkbox"/> Vitamin B6 | <input checked="" type="checkbox"/> Choline     | <input checked="" type="checkbox"/> Calcium foods |

### Food intolerances and sensitivities:

- Avoid lactose (Milk, cheese)
- Check for gluten intolerance & eliminate gluten
- Do not drink alcohol
- Limit caffeine to 1 cup coffee/day in the morning
- Avoid salt & salty foods



## Weight management

### Set realistic goals for weight management:

- Follow a gene-based diet plan

### Circadian rhythm influence:

- Eat a small dinner, avoid snacking, train late afternoon/early evening

### Challenge your bitter taste sensitivity:

- Add herbs & spices to young vegetables

### Control your sweet tooth:

- Avoid all high-sugar & artificially sweetened foods

### Incorporate mindful eating practices:

- Don't skip meals, choose healthy snacks & monitor portion-size



## Exercise response

### Exercise for weight management:

- Follow an exercise program that reaches at least 30 MET hours per week

### A power-based training program will improve performance:

- Strength, speed and power training will help you to gain the best results

### Decrease muscle cramping susceptibility:

- Ensure adequate hydration with electrolytes, warm-up properly, pace yourself

### Optimise recovery:

- Ensure sufficient rest between intensive sessions with good sleep hygiene

### Manage your risk of soft tissue injuries:

- Practice 'prehabilitative' & flexibility training & support collagen health with nutrition

# Genotype results table

 No Impact

 Beneficial Impact

 Low Impact

 Moderate Impact

 High Impact

INSIGHT	GENE NAME	GENE VARIATION	GENE RESULT	GENE IMPACT			
				Biological areas	Nutrition	Weight management	Exercise response
 Lipid metabolism	APOC3	3175 C>G					
	APOE	E2/E3/E4					
	CETP	279 G>A					
	LPL	1595 C>G					
	PON1	A>G					
 Insulin sensitivity	PPARG	Pro12Ala or C>G					
	TCF7L2	C>T					
	SLC2A2	Thr110Ile					
	FTO	T>A					
	IRS1	T>C IRS1					
 Methylation	MTHFD1	1958 G>A					
	MTHFR	677 C>T					
	MTHFR	1298 A>C					
	MTR	2576 A>G					
	MTRR	66 A>G					
	CBS	699 C>T					
	COMT	472 G>A					
 Phase I detoxification	CYP1A1	Ile462Val A>G					
	CYP1A1	Msp1 T>C					
 Phase I detoxification - caffeine	CYP1A2	A>C					
 Phase II detoxification	GSTM1	Insertion/Deletion					
	GSTP1	313 A>G					
	GSTT1	Insertion/Deletion					
	NQO1	609 C>T					



Scan for explanations of the impact factors and interpreting your genotype results

## Genotype results table (continued)

 No Impact

 Beneficial Impact

 Low Impact

 Moderate Impact

 High Impact

INSIGHT	GENE NAME	GENE VARIATION	GENE RESULT	GENE IMPACT			
				Biological areas	Nutrition	Weight management	Exercise response
 Inflammation	CRP	G>A					
	IL-1A	4845 G>T					
	IL-1A	-889 C>T					
	IL-1B	3954 C>T					
	IL-1B	-511 A>G					
	IL-1RN	2018 C>T					
	IL-6	-174 G>C					
	IL-6R	A>C					
	TNFA	-308 G>A					
 Vitamin D metabolism & bone health	VDR	Fok1 T>C					
	VDR	Bsm1 G>A					
	VDR	Taq1 T>C					
	CYP2R1	A>G					
	GC	T>G					
 Vitamin A metabolism	BCO1	G>T					
	BCO1	Ala379Val (C>T)					
 Vitamin B12 transport	FUT2	Gly258Ser G>A					
 Lactose intolerance	MCM6	-13910 C>T					
 Gluten intolerance	HLA	DQ2 / DQ8					
 Alcohol metabolism	ALDH2	rs671 G>A					
 Iron overload	HFE	C282Y & H63D					
 Fat absorption & metabolism	-11391 G>A	GG					
	APOA2	-256 T>C					
	APOA5	-1131 T>C					
	FABP2	Ala54Thr G>A					
	PLIN	11482 G>A					



Scan for explanations of the impact factors and interpreting your genotype results

## Genotype results table (continued)

 No Impact

 Beneficial Impact

 Low Impact

 Moderate Impact

 High Impact

INSIGHT	GENE NAME	GENE VARIATION	GENE RESULT	GENE IMPACT			
				Biological areas	Nutrition	Weight management	Exercise response
 Polyunsaturated fatty acid metabolism	FADS1	G>T					
 Energy homeostasis	UCP1	-3826 A>G					
	UCP2	-866 G>A					
	UCP3	55 C>T					
 Epinephrine receptors - energy mobilisation	ADRB2	Arg16Gly					
	ADRB2	Gln27Glu					
	ADRB3	Trp64Arg					
 Dopamine receptor	DRD2	C>T					
 Taste sensitivity	TAS1R2	Ile191Val					
	TAS2R38	Pro49Ala Ala262Val Val296Ile					
 Snacking & satiety	MC4R	V103I					
 Circadian rhythms	CLOCK	3111 T>C					
 Blood flow & respiration	AGT	T>C					
	ACE	I>D					
	BDKRB2	C>T					
	VEGF	C>G					
 Energy during exercise	NRF2	A>G					
	PPARGC1A	G>A					
	PPARA	G>C					
 Fuel during exercise	TRHR	C>T					
 Musculoskeletal properties	ACTN3	R>X					
 Muscle cramping susceptibility	AMPD1	G>A					
 Collagen production	COL1A1	1546 G>T					



Scan for explanations of the impact factors and interpreting your genotype results

## Your core priority areas – the detail

In this section, all of your genetic priorities per core area are again highlighted for you. This time, further detail is provided to describe the priority area, what it potentially means for you health-wise, and most importantly, what to do to support these areas.

### Biological processes

#### Lipid metabolism



#### Risk of hypertriglyceridemia

Triglycerides are a type of fat, or lipid, found in your body, and can circulate in your blood. Triglycerides are made from excess calories that you have eaten. The formation of triglycerides is a way of storing energy that your body does not need to use right away. Having high triglyceride levels can lead to hardening and damage of your blood vessels and can increase your risk of heart disease and metabolic syndrome.



#### Your results

Your genotype increases risk for having high triglyceride levels.

#### Risk



TYPICAL

ELEVATED



#### Outcomes

Avoid refined carbohydrate intake such as instant noodles, white bread, pizza and pastries and crisps. Replace carbohydrates and saturated fats (burgers, chicken skin, butter, coconut oil) with mono-unsaturated fats (peanut butter, olive oil). Manage your weight and speak to your healthcare provider about taking a good quality omega 3 supplement.

GENE VARIATION	GENE RESULT	GENE IMPACT
APOC3 3175 C>G		
APOE E2/E3/E4		





## Risk of Dyslipidaemia and altered LDL:HDL ratio

Dyslipidaemia is considered the imbalance of the different types of fats, or lipids, in the blood. When doing a blood test, if the results show that your levels of HDL, or 'good' cholesterol, to LDL, or 'bad' cholesterol, are not within a healthy balanced range, it means you have dyslipidaemia. This is a risk factor for heart disease. Diet, lifestyle, and other environmental factors all interplay with your genes to determine your risk of having unbalanced blood lipid levels.



### Your results

Your genotype increases the risk of having high 'bad' and low 'good' cholesterol.

.....

#### Risk



TYPICAL

ELEVATED



### Outcomes

Manage your weight. Limit saturated fat intake (fried rice, pizza, beef steak, full fat milk) and replace with mono-unsaturated fat sources (olive oil). Increase intake of fatty fish such as salmon and tuna. Eat at least 5 portions of vegetables and fruit daily. Speak to your healthcare provider about taking a good quality omega 3 supplement. Do not smoke. Exercise daily

GENE VARIATION	GENE RESULT	GENE IMPACT
CETP 279 G>A		
APOE E2/E3/E4		
APOC3 3175 C>G		
LPL 1595 C>G		





# Lipid oxidation

Lipid oxidation is the process whereby the different types of fat found in your blood vessels come under attack by free radicals. Smoking, being overweight, and having a high-stress lifestyle all increase the risk of having high free radicals in the body. The damage caused by free radicals changes the structure and function of the blood lipids, or fats, and leads to damage of blood vessels and arteries in the body. If there is a high level of lipid oxidation and damage constantly taking place, it increases the risk for heart disease.



## Your results

Your genotype is linked with normal function of this enzyme and no increased risk for lipid oxidation.

.....

### Risk



TYPICAL

ELEVATED



## Outcomes

Increase mono-unsaturated fat intake from olive oil, avocado and macadamia nuts, and eat a variety of vegetables and fruit to ensure good phytonutrient intake. Moderate intensity exercise is also recommended.

**GENE VARIATION**

**GENE RESULT**

**GENE IMPACT**

PON1 A>G





# Insulin sensitivity



## Risk for type 2 diabetes

Type 2 diabetes is a chronic illness characterized by consistently higher levels of sugar (glucose) in the blood. This is due to an inability to regulate and use glucose as a fuel for vital body processes because the body does not produce or use insulin effectively. Major driving factors in the development of diabetes include being overweight, having a high waist circumference, being physically inactive, and having a genetic predisposition.



### Your results

Your genotype indicates you have an elevated risk for type 2 diabetes.

.....

#### Risk



TYPICAL

ELEVATED



### Outcomes

It is essential to manage weight through regular physical exercise. Replace saturated fats such as full cream dairy, butter, lard, fat on meat, chicken skin with mono-unsaturated fats such as avocado, olive oil, macadamia nuts. Moderate total carbohydrate intake, avoiding all refined carbohydrates and increasing fibre-rich foods.

GENE VARIATION	GENE RESULT	GENE IMPACT
PPARG Pro12Ala C>G		
TCF7L2 C>T		
SLC2A2 Thr110Ile C>T		
FTO T>A		
IRS1 T>C		
IRS1 G>A		



# Methylation



## Homocysteine and methionine regulation

Methylation is a simple but key biochemical process that regulates the functioning of several biological systems. Methylation is involved in regulating mood and sleep through production of neurotransmitters, supporting DNA replication for growth and repair, forming the supportive structures that wrap around our nerves, ensuring appropriate nervous system function and cognition, production of immune cells needed for protection against infections, and ensuring healthy cell structure and appropriate communication between cells. The actual process of methylation involves making the special building blocks that can be used in regulating the above-mentioned biological systems. Methylation is also essential to help switch genes on and off, and it plays an important role in protein metabolism and breaking down homocysteine, an amino acid which can become harmful when levels in the body become too high. The methylation process is dependent on “methyl-nutrients” including our B-vitamin family as well as choline and betaine. Poor levels of these nutrients, together with variation in genes involved in methylation, can lead to suboptimal functioning of this process and an increased risk for several disorders.



### Your results

Your genotype combination leads to suboptimal functioning of these enzymes, which means elevated support is required to better optimise methylation. Poor methylation can be experienced as feelings of low mood, poor heart health, fatigue, and hormonal imbalances. Certain blood tests may also reveal that homocysteine levels (a kind of protein your body makes as a by-product of methylation) may be elevated.

### Support



TYPICAL

ELEVATED



### Outcomes

Increase your intake of vitamin B and choline-rich foods including dark green leafy vegetables, lentils, whole grains, nuts and seeds, fish and eggs. Consider supplementing with a vitamin B complex that contains L-5-methyltetrahydrofolate and methylcobalamin, but speak to your healthcare provider for advice on a good quality supplement and what is best for you based on a full assessment of your personal needs. Manage stress and avoid alcohol.

GENE VARIATION	GENE RESULT	GENE IMPACT
MTHFD1 1958 G>A		
MTHFR 677 C>T		
MTHFR 1298 A>C		
MTR 2576 A>G		
MTRR 66 A>G		
CBS 699 C>T		
COMT 472 G>A		



# Inflammation



## Risk for chronic low-grade inflammation

Inflammation is a normal immune response and an essential step in tissue healing. The release of inflammatory chemicals and proteins is controlled by genes that govern inflammation. However, when these genes are not 'switched off' the inflammatory response continues beyond the point of healing, and can lead to a condition called chronic, low-grade inflammation. An increasing number of common disorders, such as obesity, heart disease, arthritis and inflammatory bowel disease have been associated with chronic low-grade inflammation.



### Your results

Your genotype leads to an increased production of inflammation-prone markers, which is associated with an elevated risk of chronic, low-grade inflammation. This can be experienced as low mood, difficulty in losing weight, skin sensitivity, poor gut health and joint pain, as well as longer recovery time after strenuous exercise.

.....

### Risk



TYPICAL

ELEVATED



### Outcomes

It is important to follow a plant-based diet. Decrease intake of saturated fats, limit intake of omega 6 fatty acids, and increase intake of omega 3 fatty acids. Ensure you are eating a rainbow of vegetables and fruit daily. Include regular sessions of moderate-intensity exercise and ensure you are getting enough, good-quality sleep. Incorporate good stress management strategies.

GENE VARIATION	GENE RESULT	GENE IMPACT
IL-6 -174 G>C		
TNFA -308 G>A		
IL-1A 4845 G>T		
IL-1A -889 C>T		
IL-1B 3954 C>T		
IL-1B -511 A>G		
IL-1RN 2018 C>T		



# Oxidative Stress



## Function of antioxidant enzymes

Antioxidants are compounds that can defend our body from damage and accelerated ageing. They neutralise unstable molecules called free radicals that damage the DNA and cells in our body. Antioxidants are found naturally in the body in the form of enzymes or antioxidant molecules that our bodies can make themselves. They can also be consumed in a wide variety of foods, especially from vegetables and fruit. By far, the main defence system against free radicals and oxidative stress damage, is our own internal antioxidant enzymes. Ensuring optimal production and functioning of our antioxidant enzymes will significantly reduce risk of disease and support overall good health and longevity.



### Your results

Your genotype is linked to suboptimal function of antioxidant enzymes. You are at risk for poor antioxidant status and related oxidative stress-driven disorders.

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#### Function



TYPICAL

SUBOPTIMAL



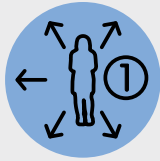
### Outcomes

It is important to manage weight, and follow a daily exercise routine that includes low to moderate intensity exercises. It is recommended to stop smoking. Ensure an intake of at least 7 portions of different coloured vegetables and fruit per day. Include selenium rich foods such as Brazil nuts, sardines and turkey and ensure adequate intake of oily fish (3 x per week). Consider antioxidant supplementation as recommended by your practitioner.

GENE VARIATION	GENE RESULT	GENE IMPACT
eNOS 894 G>T		
MnSOD/SOD2 47 T>C (Val116Ala)		
GPX Pro198Leu C>T		
CAT -262 C>T		



# Detoxification



## Phase I detoxification function

The detoxification process in the body has two phases. The enzymes involved in phase one detoxification are known as 'activators;' they activate the substance that needs to be removed, allowing the next phase to proceed. Phase I enzymes must exhibit just the right amount of activity for the detoxification process to be effective. Activated compounds in phase I are potentially harmful. If phase I detoxification works too quickly, the overflow of products from phase I detoxification cannot be dealt with effectively, causing damage to cells and increasing risk for disease.



### Your results

You are at an increased risk for poor detoxification. Ensure adequate intake of green leafy vegetables, preferably organic, and follow a healthy balanced diet as prescribed by your healthcare practitioner.

#### Function

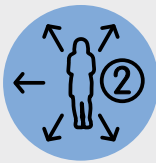


### Outcomes

Decrease the 'load' on phase I detoxification by decreasing exposure to environmental pro-carcinogens such as cigarette smoke, smoked and chargrilled foods, pesticides and other pollutants. Avoid all chargrilled meats. Consider introducing spices such as curcumin from turmeric root, along with red chili pepper, clove oil, and quercetin to moderate phase I detoxification.

GENE VARIATION	GENE RESULT	GENE IMPACT
CYP1A1 Ile462Val A>G		





## Phase II detoxification function

The phase II detoxification enzymes that take over from phase I detoxification enzymes can be considered as 'neutralising' or 'excretory' enzymes because they initiate reactions leading to the excretion of toxins from the body. These enzymes bind the chemical compound glutathione to the 'active' toxins from phase I, making them water soluble so they can be excreted through sweat or urine. Decreased activity or deletion of these genes has been associated with gut health issues, skin sensitivities, and other chronic diseases of lifestyle.



### Your results

You have decreased detoxification ability and therefore an increased risk for DNA damage.

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#### Function



REDUCED

TYPICAL



### Outcomes

To support phase 2 detoxification, increase intake of a variety of fruits and vegetables, preferably organic, with a specific emphasis on daily intake of broccoli, cauliflower and kale.

GENE VARIATION	GENE RESULT	GENE IMPACT
GSTM1 Insertion/Deletion		
GSTP1 313 A>G		
GSTT1 Insertion / Deletion		
NQO1 609 C>T		



# Bone and joint health



## Bone mineral density and osteoporosis risk

Our bones are not a fixed structure. Our cells work continuously to dissolve old bone and create new bone tissue. After the age of 30, both men and women start losing bone mass; the loss is particularly marked in women after menopause. Accelerated bone mass losses can increase the risk for having a low bone mineral density, eventually leading to osteoporosis. According to latest research both nutrition and genetic factors play an important role in determining bone health.



### Your results

Your genotype results are linked to having an elevated risk for a low bone mineral density as well as being more susceptible to developing osteoporosis.

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#### Risk



TYPICAL

ELEVATED



### Outcomes

Ensure adequate Vitamin D (mushrooms, fatty fish, egg yolks) and calcium (low fat dairy, fatty fish, almonds) intake, and other 'bone-building' nutrients such as phosphorous, magnesium, boron, vitamin K, zinc and manganese. Include load bearing exercises to help maintain adequate bone mineral density. Ensure caffeine intake does not exceed 300mg per day (3 cups of coffee per day).

GENE VARIATION	GENE RESULT	GENE IMPACT
VDR FokI T>C		
VDR BsmI G>A		
VDR TaqI T>C		
COL1A1 1546 G>T		



# Nutrition

## Macronutrient requirements



### Carbohydrate intake

A high carbohydrate intake has often been associated with an increased risk for obesity and insulin resistance, meaning that a high intake of carbohydrate may hinder your ability to lose weight. Certain gene variants are associated with weight loss resistance when there is a high dietary intake of carbohydrates.



#### Your results

Your genotype is associated with good weight management outcomes, even when eating carbohydrate-rich foods, meaning that it is likely that your carbohydrate intake will not influence your ability to lose weight, provided it is part of the most suitable diet plan for you.

#### Sensitivity



HIGH



#### Outcomes

By managing the amount of carbohydrates in your diet, you will improve your weight loss outcomes and prevent weight regain. Avoid intake of starchy foods such as bread, pasta, and potato, rather opting for colourful vegetables and some fruit as a healthy carbohydrate source. Eliminate all refined carbohydrates, carbohydrate-based snacks and sugar-rich foods (sweets, crisps, biscuits etc.)



#### Food sources

	Male	Female
Nutritional adequacy rate	430g	360g
CARBOHYDRATE SOURCE	Weight	g
White rice	100g	28
Brown rice	100g	23
Corn	100g	19
Breads	100g	49
Potato, baked	100g	21

GENE VARIATION	GENE RESULT	GENE IMPACT
ADIPOQ -11391 G>A		
ADRB2 Gln27Glu C>G		
DRD2 C>T		
TAS1R2 Ile191Val G>A		
SLC2A2 Thr110Ile C>T		





## Weight loss response to mono-unsaturated fat intake

Mono-unsaturated fats (MUFA) are a type of unsaturated fat that have significant health benefits; these can be found in olive oil, avocados, and certain nuts. Particular gene variants have been associated with lower body weight when there is a higher intake of mono-unsaturated fats in the diet (approximately >13% of total calories). Benefits are seen if mono-unsaturated fats replace saturated fats or carbohydrates in the diet - i.e., replacing other calories, rather than adding extra calories to your diet. Genetic variants in certain genes have been associated with a lower body weight in individuals when more than 13% of their calories come from mono-unsaturated fats.



### Your results

Your genetic results show that you may experience extra benefit from a high MUFA intake. You may be protected from weight gain and lose weight more easily when you have a higher intake of MUFA in your diet.

It is still important to limit total saturated fat intake for heart health as you carry the APOE E4 genotype.

#### Benefit



### Outcomes

Increase your MUFA intake to at least 13% of total calories per day. Good sources of MUFAs include extra virgin olive oil, olives, avocado, and macadamia nuts. Replace other cooking fats with extra virgin olive oil and only cook at lower temperatures.



### Food sources

MUFA CONTENT	Weight	g
Olive oil	1 Tbs	1.4
Olives	30g	2.31
Avocado pear	1 medium	15
Almonds	30g	11.2
Peanut butter	2 Tbs	8

GENE VARIATION	GENE RESULT	GENE IMPACT
FABP2 Ala54Thr G>A		
ADIPOQ -11391 G>A		
TCF7L2 C>T		





## Weight loss and heart health response to total fat and saturated fat intake

Saturated fats are a type of dietary fat which is typically semi-solid at room temperature. Foods high in saturated fat include baked goods, fried foods, animal fats including fatty or processed meats, whole-fat dairy products and fats like coconut oil, palm or palm kernel oils found in packaged foods. Certain gene variations have been associated with increased obesity risk and slower weight loss outcomes when there is a high saturated fat intake. Some gene variations are linked to increased inflammation risk with a high intake of animal fat foods.



### Your results

According to your gene results, your intake of saturated fat is not likely to increase your risk for weight gain or hinder your ability to lose weight.

#### Sensitivity



HIGH



### Outcomes

Decrease saturated fat to less than 7% of total energy intake. You can reduce total saturated fat intake by choosing low fat and fat free dairy options (low fat milk and cottage cheese) over full-fat dairy products (cream, butter, hard cheese) and avoid fatty meats, limiting red meat intake to not more than 2 times per week. Many processed foods that are high in saturated fats are also low in nutrients and have added calories from sugar. Try to avoid baked goods, fried foods, animal fats including fatty or processed meats, whole-fat dairy products and fats like coconut oil, palm or palm kernel oils found in packaged foods.

GENE VARIATION	GENE RESULT	GENE IMPACT
FABP2 Ala54Thr G>A		
ADIPOQ -11391 G>A		
PPARG Pro12Ala C>G		
APOA2 -256 T>C		
TCF7L2 C>T		
FTO T>A		
APOA5 -1131 T>C		
PLIN 11482 G>A		
MC4R V103I T>C		
TNFA -308 G>A		



### Food sources

SATURATED FAT CONTENT	Weight	g
Butter	1 Tbs	7
Chicken breast with skin	1 medium	2.5
Beef sirloin steak	100g	6
Milk, whole	1 glass	5
Coconut oil	1 Tbs	12





## Polyunsaturated fat requirements for health and weight loss response

Genetic variants in certain genes have been associated with a lower body weight in individuals when there is a higher intake of polyunsaturated fats in the diet, with a focus on omega 3 fatty acids. Polyunsaturated fats (PUFA) are essential for brain function and managing inflammation. The best source of omega-3 fatty acids is fatty fish like salmon, sardines, or pilchards. Other sources include pine nuts, walnuts, and flax- and sunflower seeds. Genetic variants in certain genes have been associated with improved weight management outcomes when there is a higher intake of polyunsaturated fats in the diet, with a focus on omega 3 fatty acids, while at the same time limiting the total saturated fat intake.



### Your results

Your genes show that you may have a beneficial response with weight management when you increase your total PUFA intake and there is a higher ratio of PUFA:SFA (saturated fatty acids) in the diet.

To support heart, brain and cellular health, focus on increasing intake of omega 3 fatty acids specifically from fatty fish sources. Supplement if necessary.

.....

#### Benefit



TYPICAL

ENHANCED



### Outcomes

Replace a majority of your saturated fat intake with polyunsaturated fats such as various fish and seeds. Good quality PUFA sources include a variety of nuts and seeds, nut butters, and fatty fish.



### Food sources

PUFA CONTENT	Weight	g
Walnuts	14 halves	13
Flaxseed, ground	1 Tbs	2
Sunflower seeds	15g	3
Salmon, atlantic raw	100g	3.9
Pilchards, tinned	100g	1.8

GENE VARIATION	GENE RESULT	GENE IMPACT
PPARG Pro12Ala C>G		
FTO T>A		
TNFA -308 G>A		
FADS1 G>T		





# Protein intake

Our body needs dietary protein to supply amino acids for the growth and maintenance of our cells and tissues. There are a total of 20 amino acids, 9 of which are essential, meaning that the body cannot make them, and they need to be consumed through the diet. Different protein sources are considered better quality if they include more of these essential amino acids. Typically, animal proteins provide more of these essential amino acids. This does not mean that you are unable to consume sufficient protein if you do not eat animal products, but instead you may have to eat greater quantities and a greater variety of plant proteins or consider supplementation. Good sources of protein include lean ground beef, chicken breasts, salmon, whole eggs, chickpeas, lentils, soy such as tofu, and red kidney beans.



## Your results

Protein intake is a high benefit for you. You may have a beneficial weight management response when there is a higher protein intake in your diet.

.....

### Benefit



TYPICAL

ENHANCED



## Outcomes

Protein intake is a high benefit for you. You may have a beneficial weight management response when there is a higher protein intake in your diet. Remember to replace calories, and not add calories.



## Food sources

	Male	Female
Nutritional adequacy rate	65g	60 g
SOURCE OF FOOD	Weight	g
Cow's meat	100g	26
Goat's meat	100g	27
Chicken	100g	27
Fish	100g	27
Whole egg	1	6

GENE VARIATION	GENE RESULT	GENE IMPACT
FTO T>A		





## Iron overload (hemochromatosis)

Hereditary hemochromatosis is a genetic disorder in which there is excessive accumulation of iron in the body, leading to iron overload. In individuals with the disorder, the daily absorption of iron from the intestines is greater than the amount needed to replace losses. Since the normal body cannot increase iron excretion, the absorbed iron builds up in the body. This extra iron can cause damage to organs such as the heart, liver, and pancreas. While some individuals, with the genes for hemochromatosis, do not show signs and symptoms of the disease, others may show severe symptoms such as joint pain, erectile dysfunction, heart failure, fatigue, and darkening of skin colour. Although it can cause serious problems, it is a very treatable condition, especially when identified early.



### Your results

Your HFE genotype leads to a poor ability to regulate iron levels in the body and makes you more susceptible to iron overload, which can develop into haemochromatosis.

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### Risk



NO RISK

INCREASED

GENE VARIATION	GENE RESULT	GENE IMPACT
HFE C282Y & H63D		



### Outcomes

Speak to your healthcare provider about blood tests that measure levels of iron load and further risk management including donating blood. Decrease the intake of red meat and high fat foods and limit alcohol intake. Do not take any supplements containing iron. Avoid eating vitamin C rich foods together with green leafy vegetables. Avoid cooking in iron-pots.



### Food sources

	Male	Female
Nutritional adequacy rate	8-11mg	8-18mg
SOURCE OF FOOD	Weight	mg
Lentils	100g (canned)	3.1
Beef, roast	100g	2.89
Clam (shellfish)	100g	1.95
Spinach (raw)	100g	1.26
Broccoli	100g	0.69



# Micronutrient requirements



## Vitamin A

Vitamin A is a fat-soluble vitamin and essential for human life. Vitamin A has several crucial functions in the body. It helps cells reproduce normally, it is essential for good vision, assists with wound healing and bone formation, and supports the immune system. As humans, we do not make Vitamin A and need to obtain it from the diet as provitamin A, such as beta-carotene. Once taken up, it is processed into active vitamin A and/or stored for future processing to perform its functions when needed. The ability to convert provitamin A into active vitamin A is dependent on the enzyme  $\beta$ -carotene 15,15'-oxygenase. This conversion can be altered because of genetic variations in the enzyme-coding gene, BCO1, which can result in an individual having high levels of provitamin A and low levels of active vitamin A.



### Your results

Your genotype combination leads to poor ability to convert carotenoids into the active form of vitamin A, which is essential for immunity, eye, and skin health. You may therefore have increased requirements of active vitamin A.

### Requirements



### Outcomes

Increase your intake of yellow, orange, and green leafy fruits and vegetables that are rich in carotenoids (pro-vitamin A). Suggested recommended intake for beta-carotene ranges between 2 - 4.8 mg/day, with higher intake from foods, over supplementation, showing more favourable effects. Also focus on sources of pre-formed vitamin A from eggs, dairy, liver and fish. Speak to your healthcare provider before taking an active vitamin A supplement.



### Food sources

GENE VARIATION	GENE RESULT	GENE IMPACT
BCO1 G>T		
BCO1 Ala379Val C>T		

	Male	Female
Nutritional adequacy rate	900mcg	700mcg
SOURCE OF FOOD	Weight	mcg
Sweet potato with skin (cooked)	1 medium (151g)	1190
Carrots (raw)	1 cup (120g)	1000
Squash (cooked)	100g	558
Tuna (cooked)	75g	491-568
Eggs	2 large eggs	190-252





## Vitamin B2

Vitamin B2, also known as riboflavin, is a water-soluble vitamin that is found in a variety of foods including salmon, milk, and spinach. Vitamin B2 plays an important role in the production of energy, protecting DNA from getting damaged, and it is needed to help the body change vitamin B6 and folate into more usable forms. It is also important for growth and red blood cell production. Our body is unable to make this essential nutrient itself, so we must get adequate amounts of vitamin B2 through dietary intake.



### Your results

Your genotype combination means that these enzymes are not working as well as they should and your requirements for vitamin B2 may be increased. This may lead to an insufficiency of vitamin B2, which can be experienced as dry skin, mouth ulcers, cracked lips and feelings of low energy.

.....

### Requirements



### Outcomes

Increase your intake of vitamin B2-rich food sources such as low-fat milk, lean beef and spinach, to reach a requirement of 1.1 to 1.3mg per day. A vitamin B-complex supplement could be considered, but first speak to your healthcare provider for advice on a good quality supplement and check if vitamin B2 supplementation is necessary based on your personal needs.



### Food sources

	Male	Female
Nutritional adequacy rate	1.3mg	1.1mg
SOURCE OF FOOD	Weight	mg
Beef steak	100g	0.9
Low fat milk	475ml	0.9
Salmon	100g	0.5
Tofu	100g	0.4
Spinach (cooked)	250ml	0.4

GENE VARIATION	GENE RESULT	GENE IMPACT
MTHFR 677 C>T		
MTHFR 1298 A>C		
MTRR 66 A>G		





# Vitamin B6

Vitamin B6 is a water-soluble vitamin that is naturally present in many foods. The richest sources of vitamin B6 include fish, beef liver and other organ meats, potatoes and other starchy vegetables, and fruit. This vitamin performs many functions in the body. One of its main roles is to help the body metabolise proteins, fats, and carbohydrates for energy. Vitamin B6 is also involved in brain development, immune function and in maintaining normal levels of homocysteine, an amino acid which can become harmful when levels become too high in the body. Insufficient vitamin B6 intake can increase the risk of cardiovascular disease and cognitive decline.



## Your results

Your genotype combination shows suboptimal functioning of these enzymes, which means you may develop an insufficiency for vitamin B6, which can be experienced as low energy, low mood and getting sick more often.

.....

### Requirements



TYPICAL

INCREASED



## Outcomes

Increase your intake of vitamin B6-rich food sources such as lean chicken, tofu and bananas, to reach a requirement of 1.3 to 1.7mg per day. A vitamin B-complex supplement could be considered, but first speak to your healthcare provider for advice on a good quality supplement and whether vitamin B6 supplementation is necessary based on a full assessment of your personal needs.



## Food sources

	Male	Female
Nutritional adequacy rate	1.3-1.7mg	1.3-1.5mg
SOURCE OF FOOD	Weight	mg
Salmon	100g	0.9
Lean chicken breast	100g	0.9
Tuna	1 can	0.8
Tofu	100g	0.5
Banana	100g	0.5
Avocado	1 (150g)	0.4

GENE VARIATION	GENE RESULT	GENE IMPACT
MTHFR 677 C>T		
CBS 699 C>T		







## Folate

Folate, also known as vitamin B9 or folic acid in its synthetic form, is a water-soluble vitamin that is found in green leafy vegetables. Folate plays an important role in helping to make and repair DNA and for proper cell growth. It is also essential for red blood cell formation and function. It is crucial for pregnant women to get sufficient folate to support foetal growth. Folate also supports good heart health, and mental health, decreasing risk for depression and dementia, and it may reduce the risk of various cancers. Our body is unable to make this essential nutrient itself, so we must get adequate amounts of folate through dietary intake or, when indicated, through supplementation.



### Your results

Your genotype combination shows suboptimal functioning of these enzymes, which means you could become insufficient in folate. This can be experienced as weakness, fatigue, difficulty concentrating, and low mood.

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### Requirements



TYPICAL

INCREASED



### Outcomes

Increase your intake of folate-rich food sources such as edamame and bayam, to reach a requirement of 400 mcg per day. Note that if you are pregnant, or planning to fall pregnant, this is a very important nutrient for you and your growing baby, and your requirements will be increased. A vitamin B-complex supplement could be considered, but first speak to your healthcare provider for advice on a good quality supplement and whether folate supplementation is necessary based on a full assessment of your personal needs.

GENE VARIATION	GENE RESULT	GENE IMPACT
MTHFR 677 C>T		
MTHFR 1298 A>C		
MTR 2576 A>G		
MTRR 66 A>G		
MTHFD1 1958 G>A		



### Food sources

	Male	Female
<b>Nutritional adequacy rate</b>	400mcg	400mcg
<b>SOURCE OF FOOD</b>	<b>Weight</b>	<b>mcg</b>
Beef liver	100g	258
Beans	100g	147
Edamame beans (cooked)	125ml	106-255
Spinach (raw)	100g	116
Broccoli	125ml	89
Lettuce	250ml	65-80





# Vitamin B12

Vitamin B12 or cobalamin is an essential nutrient that is naturally found in foods of animal origin, including fish, meat, eggs, and dairy products. It is usually bound to the protein in food and must be released before it can be absorbed by the body. Vitamin B12 plays a critical role in development, functioning of the central nervous system, healthy red blood cell formation, and DNA synthesis. Variations in the genes involved in the absorption, transport, cellular uptake, and metabolism of vitamin B12 can lead to altered vitamin B12 status. A deficiency of vitamin B12 has been linked to health complications including an increased risk of neuropsychiatric symptoms, cardiovascular diseases, and the onset of different forms of cancer.



## Your results

Your genotype combination shows suboptimal functioning of these enzymes, which means you could develop an insufficiency in vitamin B12. This can be experienced as fatigue, headaches, low mood, difficulty concentrating, and pins-and-needles in hands and feet.

.....

## Requirements



TYPICAL

INCREASED

GENE VARIATION	GENE RESULT	GENE IMPACT
FUT2 Gly258Ser G>A		
MTRR 66 A>G		



## Outcomes

Increase your intake of vitamin B12-rich food sources such as tuna and eggs, to reach a requirement of 4 mcg per day. Note that if you are vegan, elderly, pregnant, or planning to fall pregnant, it may be more difficult to reach your requirements of vitamin B12. A vitamin B-complex supplement could be considered, but first speak to your healthcare provider for advice on a good quality supplement and whether vitamin B12 supplementation is necessary based on a full assessment of your personal needs. Consider a probiotic to manage gut health.



## Food sources

	Male	Female
<b>Nutritional adequacy rate</b>	2.4mcg	2.4mcg
<b>SOURCE OF FOOD</b>	<b>Weight</b>	<b>mcg</b>
Tuna (cooked)	75g	8.2-9.3
Salmon (cooked)	75g	2.1-4.4
Minced beef (cooked)	75g	2.4-2.7
Egg	2 large eggs	1.1-1.6
Milk (whole)	1 cup (250ml)	1.2-1.4





# Choline

Choline is a nutrient that is found in many foods such as meat, eggs, poultry, fish, and dairy products. It has a vital role to play in regulating memory, mood, and muscle control. Choline is also an important component of your cell’s outer membranes, ensuring the structural integrity and signaling functions of the cell. A small amount of choline is produced in the liver, but this is not sufficient to meet our body’s needs. Sufficient choline must be obtained from the diet. Inadequate choline levels could increase the risk of cardiovascular disease and neurological conditions.



## Your results

Your genotype shows suboptimal functioning of this enzyme, which means you could develop insufficiencies in choline. This can be experienced as weakness, and difficulty concentrating, and is related to risk of poor heart health, and decreased functioning of liver and muscles.

.....

### Requirements



TYPICAL

INCREASED



## Outcomes

Increase your intake of choline-rich food sources such as egg and soybeans reach a requirement of 425 to 550 mg per day. Note that if you are vegan, elderly, pregnant, or planning to fall pregnant, it may be more difficult to reach your requirements of choline. A choline supplement could be considered, but first speak to your healthcare provider for advice on a good quality supplement and what is best for you based on a full assessment of your personal needs.



## Food sources

	Male	Female
Nutritional adequacy rate	550mg	425mg
SOURCE OF FOOD	Weight	mg
Egg	1 egg	147
Soybeans (cooked)	1 cup (185g)	82
Chicken breast	85g	72
Salmon	85g	67
Milk (whole)	1 cup (250ml)	43

GENE VARIATION	GENE RESULT	GENE IMPACT
MTHFD1 1958 G>A		





# Vitamin C

Vitamin C is an essential vitamin naturally present in some foods, such as fresh fruits and vegetables, especially citrus fruits. The human body is unable to make vitamin C itself, so it is an essential nutrient we must take in from our diet. Vitamin C is needed for the growth and repair of tissues, repair and maintenance of cartilage, bones, and teeth and facilitates the absorption of iron. It plays a key role in immune function and limits the damaging effects of free radicals through its antioxidant activity. A deficiency of vitamin C can result in oxidative stress-related conditions such as cardiovascular disease, neurodegenerative diseases, and cancer.



## Your results

A deletion in the gene means that you are more susceptible to vitamin C insufficiency. This may be experienced as poor wound healing, dry hair and dull skin, lower immunity and irritability.

.....

### Requirements



TYPICAL

INCREASED



## Outcomes

Increase your intake of vitamin C-rich food sources such as guava and kiwi to meet a minimum requirement of 75 to 90 mg per day. Vitamin C supplementation could be considered, but first speak to your healthcare provider for advice on a good quality supplement and what is best for you based on a full assessment of your personal needs.



## Food sources

	Male	Female
Nutritional adequacy rate	90mg	75mg
SOURCE OF FOOD	Weight	mg
Guava	165g	377
Bell pepper	1 cup chopped (149g)	120
Papaya	140g	87
Orange	1 fruit (154g)	87
Kiwi	1 fruit (75g)	56

GENE VARIATION	GENE RESULT	GENE IMPACT
GSTT1 Insertion/Deletion		





# Vitamin D

Vitamin D, referred to as calciferol, is a fat-soluble vitamin that is naturally present in a few foods, but also produced in our bodies when ultraviolet (UV) rays from sunlight strike the skin and trigger vitamin D synthesis. Vitamin D is essential for supporting good bone, teeth, and muscle health. It also plays important roles in foetal programming and nerve development, facilitates insulin secretion to control blood sugar levels, and supports immune function.



## Your results

Your genotypes lead to normal function of the vitamin D transporter and activator enzyme and thus no increased requirements for vitamin D is indicated.

.....

### Requirements



TYPICAL

INCREASED



## Outcomes

Increase your intake of vitamin D-rich food sources such as salmon and canned tuna to meet a minimum requirement of 600 IU per day. Being outdoors in the sun for half an hour will also assist in improving vitamin D levels. Vitamin D supplementation could also be considered, but first speak to your healthcare provider for advice on a good quality supplement and what is best for you based on a full assessment of your personal needs.

GENE VARIATION	GENE RESULT	GENE IMPACT
CYP2R1 A>G		
GC T>G		
GC 1296 G>T		



## Food sources

	Male	Female
<b>Nutritional adequacy rate</b>	600 IU	600 IU
SOURCE OF FOOD	Weight	IU
Mushrooms (Maitake) (raw)	1 cup diced (70g)	784 IU
Trout	1 fillet (79g)	502IU
Salmon	100g	450 IU
Tuna	1 can	270 IU
Egg yolk	1 (egg)	40 IU





## Calcium requirements

Calcium is a major constituent of our bones, providing strength and structure. Our bones are the main storage site of calcium and the regulation of calcium release is important for maintaining healthy cellular levels of calcium in our bodies. Ensuring adequate intake of calcium in the diet from a young age will help to build strong bones and decrease risk of developing low bone mineral density later in life. How our bodies absorb calcium is, to some extent, genetically determined.



### Your results

Your genotype is linked with a decreased function of the receptor, which may hinder calcium absorption. Insufficient calcium can be experienced as poor dental health, brittle hair and nails with white spots on your nails.

### Requirements



### Outcomes

Increase intake of calcium-rich foods to support bone health and meet requirements of 1200mg per day. Good food sources include cow's milk and yogurt, tofu and canned salmon.



### Food sources

	Male	Female
Nutritional adequacy rate	1000-1200 mg	1000-1200 mg
SOURCE OF CALCIUM	Weight	mg
Cow's milk	1 glass	275-350
Yoghurt	250g	260
Tofu	100g	350
Spinach	1 cup	250
Canned salmon	1 can	350

GENE VARIATION	GENE RESULT	GENE IMPACT
VDR FokI T>C		
VDR BsmI G>A		
VDR TaqI T>C		



# Food intolerance and sensitivity



## Lactose Intolerance

Many adults are genetically predisposed to not be able to digest larger quantities of milk or milk products. This is known as lactose intolerance. Lactose, a sugar found in milk, is broken down by an enzyme called lactase, found in the small intestines. This enzyme is produced by the LCT or lactase gene. For many people, the production of this enzyme stops before adulthood, however this is dependent on your genes. Individuals who suffer from this condition may experience abdominal cramps, bloating, nausea, flatulence, and diarrhoea.



### Your results

Your genotype is associated with a decreased ability to make the enzyme that breaks down lactose and you may be lactose intolerant. Opt for yogurt and other fermented dairy products over fresh milk. Lactose-free milk and other dairy alternatives may be used. Consider using a probiotic to support gut health.

#### Tolerance



GENE VARIATION	GENE RESULT	GENE IMPACT
MCM6 -13910 C>T		



### Outcomes

Decrease total dairy intake to no more than one cup spread out through the day. Opt for yogurt and other fermented dairy products. Lactose free milk and other dairy alternatives may be used. Consider using a probiotic.



### Food sources

Some lactose intolerant individuals can tolerate up to 12 g of lactose per day, which is equivalent to 1 cup of milk

SOURCE OF FOOD	Weight	g
Cow's milk	1 cup	12
Goat's milk	1 cup	11
Flavoured milk	1 cup	10
Yoghurt	¾ cup	7
Ice cream	½ cup	5





# Gluten intolerance (coeliac disease risk)

Coeliac disease (CD) is a common, autoimmune disorder in which the small intestine is damaged in response to a severe gluten intolerance. Gluten is the protein found in grains such as wheat, barley, and rye. Classical symptoms of coeliac disease include diarrhoea, bloating, and wind, which is triggered by gluten ingestion. Other less typical signs of gluten intolerance include fatigue, anaemia, and osteoporosis.



## Your results

You have an increased risk for coeliac disease and non-coeliac gluten sensitivity based on your genotype result.

.....

### Risk



NO RISK

ELEVATED



## Outcomes

If you find that you suffer from related symptoms, consider a gluten free diet. Gluten free grains include quinoa and buckwheat. Avoid gluten-containing foods and grains such as wheat, rye, oats and barley. Consult with a dietitian for guidelines on following a gluten free diet.



## Food sources

### MAJOR SOURCES OF GLUTEN

Wheat-based breads

Pasta

Baked goods

Cereal

Crackers & crisps

GENE VARIATION	GENE RESULT	GENE IMPACT
HLA DQ2/DQ8		







# Alcohol metabolism

Alcohol metabolism is a complex process with large differences in absorption, distribution, and elimination between different people. Alcohol is first broken down into acetaldehyde, which is highly toxic and is known to cause cancer. Acetaldehyde is then further broken down into a less harmful compound called acetate, by the aldehyde dehydrogenase 2 (ALDH2) enzyme. From there it can be broken down into water and carbon dioxide for easy elimination. The damaging effects of alcohol are directly related to the blood-alcohol levels achieved after alcohol intake, as well as the ability to break down and remove the highly toxic product of alcohol metabolism, acetaldehyde. This depends on the genetic variations found in the gene encoding ALDH2, as well as environmental factors, such as the amount of alcohol you consume.



## Your results

You carry the A variant, which leads to a complete inability to convert toxic acetaldehyde to acetate. High levels of aldehydes, especially acetaldehyde, in the blood have been shown to interfere with DNA synthesis and repair, and have been associated with increased risk for oxidative stress and cancer.

.....

### Rate of breakdown



TYPICAL

SLOW



## Outcomes

Completely avoid any alcohol intake. Weight management is also important. Limit intake of high fat foods and saturated fat, such as butter, lard, and fast foods.



## Food sources

### PERCENTAGE OF ALCOHOL

Cider	5%
Beer	2-8%
Wine	10-20%
Sake / soju	20-40%
Vodka and tequila	40%
Brandy and gin	35-55%

GENE VARIATION	GENE RESULT	GENE IMPACT
ALDH2 G>A		





# Caffeine sensitivity

Caffeine is the most widely used stimulant and is found in relatively high amounts in coffee and energy drinks. Coffee and caffeine affect different people in different ways. There is strong evidence to support personalised guidelines when it comes to caffeine intake and recommendations. For some people, a high caffeine intake is linked to increased risk for heart disease and spikes in blood pressure, whereas improved exercise performance is experienced by other individuals. Others may experience poor sleep and anxiety related to a higher caffeine intake. Responsiveness to caffeine is thus largely genetically dependant.



## Your overall results

Your genotype indicates you may experience adverse effects to a high caffeine intake. Due to the variants that you carry, a high caffeine intake may increase risk for heart disease, spike blood pressure, increase feelings of anxiety, and predispose to a lower bone mineral density.

.....

### Caffeine sensitivity



## Outcomes

Follow standard healthy guidelines for caffeinated beverages and coffee intake. Consider using caffeine as a performance enhancer.



## Food sources

SOURCE OF FOOD	Portion	mg
Brewed coffee	1 cup /240ml	95
Instant coffee	1 cup /240ml	60
Black tea	1 cup /240ml	45
Soda (cola)	350ml can	40
Chocolate (dark)	30g	24



## Caffeine sensitivity: Bone health

Caffeine consumption can impact your bone health. A high caffeine intake has been reported to interact with calcium absorption and decrease bone mineral density, increasing risk of fractures.



### Your results

Your genotype is linked to a change in the receptor function and a decreased ability to absorb calcium when caffeine intake is high.

### Caffeine sensitivity



TYPICAL

SENSITIVE



### Outcomes

Limit all caffeine to less than 300mg per day, which is equivalent to drinking 2 to 3 cups of filter coffee.

GENE VARIATION	GENE RESULT	GENE IMPACT
VDR FokI T>C		
VDR BsmI G>A		
VDR TaqI C>T		

## Caffeine sensitivity: Anxiety and sleep

Caffeine can increase your heart rate, blood pressure and stress hormone levels, which is similar to what happens when under high stress conditions. Some individuals tend to break down these stress hormones at a slower rate, and a high caffeine intake can hinder this break-down process even further. Your genotype will influence whether you are someone who feels more anxious and struggles to sleep after excess caffeine consumption or drinking coffee too late in the day.



### Your results

Your genotype results in a slower acting enzyme, which means you may be more sensitive to caffeine intake. You may experience more anxiety and jitters and be unable to fall asleep after caffeine intake.

### Caffeine sensitivity



TYPICAL

SENSITIVE



### Outcomes

Limit caffeinated coffee intake to not more than one cup in the morning, otherwise opt for decaffeinated options. Avoid all other caffeinated beverages.

GENE VARIATION	GENE RESULT	GENE IMPACT
COMT 472 G>A		



## Caffeine sensitivity: Performance

Moderate doses of caffeine intake have been reported to improve both sprint and endurance performance. In terms of athletic performance and benefits, how you respond to caffeine is dependent on whether you are a fast or slow caffeine metaboliser and on your habitual caffeine intake.



### Your results

Your genotype result indicates that you are a faster metaboliser of caffeine. This has been linked to the sports performance benefits that have been linked with caffeine intake.

#### Caffeine response



NON-RESPONDER

POSITIVE RESPONDER



### Outcomes

Follow standard healthy guidelines for caffeinated beverages and coffee intake. Consider using caffeine as a performance enhancer.

GENE VARIATION	GENE RESULT	GENE IMPACT
CYP1A2 A>C		

## Caffeine sensitivity: Heart health

Caffeine intake can cause spikes in blood pressure and can increase risk of heart disease depending on whether you are a fast or slow metaboliser of caffeine.



### Your results

Your genotype result indicates that you have a reduced ability to metabolise caffeine. Due to this, when drinking coffee, you may experience a spike in blood pressure and there is an increased risk of heart disease.

#### Caffeine sensitivity



TYPICAL

SENSITIVE



### Outcomes

Follow standard healthy guidelines for tea and coffee intake and other caffeinated beverages.

GENE VARIATION	GENE RESULT	GENE IMPACT
CYP1A2 A>C		





# Salt sensitivity

Salt sensitivity is a measure of how one's blood pressure responds to salt intake. Certain genetic variations can predispose individuals to salt sensitivity. If you are salt-sensitive, then you are at a higher risk of having spikes in your blood pressure when you consume foods high in salt. This is especially harmful if you already suffer from high blood pressure (hypertension), as high blood pressure is a major risk factor for heart disease and stroke.



## Your results

Your genotype makes you more sensitive to salt intake and can lead to spikes in blood pressure with higher salt intake.

### Salt sensitivity



GENE VARIATION	GENE RESULT	GENE IMPACT
ACE I>D		
AGT T>C		



## Outcomes

Significantly reducing your salt intake will be beneficial to your health if you suffer from hypertension.



## Food sources

SALT CONTENT	Portion	mg
Instant noodle	1 pack	1000-1200
Chicken broth	240ml	782
Canned soup	1 can	700
Tomato ketchup	¼ cup	321
Salted fish	100g	200



# Weight management

## Weight and body composition management



### Risk for obesity

Obesity risk refers to the contribution of your genotype predisposing you to becoming overweight/obese and provides insight to responsiveness to a weight management programme.



#### Your results

Your genetic risk score for obesity indicates there are some genetic barriers for becoming overweight when exposed to an obesogenic environment - being physically inactive and taking in too many calories.

.....

#### Risk



MODERATE



#### Outcomes

A low genetic risk score means that in an obesogenic environment - low physical activity and a very high calorie intake - would not impact you as negatively as someone with a higher genetic risk score. There are of course other factors that impact weight gain, and it is still important to maintain a healthy diet and lifestyle for overall wellbeing.

GENE VARIATION	GENE RESULT	GENE IMPACT
ADIPOQ -11391 G>A		
ADRB2 Arg16Gly A>G		
APOA2 -256 T>C		
APOA5 -1131 T>C		
FABP2 Ala54Thr G>A		
PPARG Pro12Ala C>G		
PLIN 11482 G>A		
UCP1 -3826 A>G		
UCP2 -866 G>A		
UCP3 55 C>T		

GENE VARIATION	GENE RESULT	GENE IMPACT
ADRB2 Gln27Glu C>G		
DRD2 C>T		
SLC2A2 Thr110Ile C>T		
TAS1R2 Ile191Val G>A		
FTO T>A		
MC4R V103I T>C		
TCF7L2 C>T		
ADRB3 Trp64Arg T>C		
CLOCK 3111 T>C		
TNFA -308 G>A		





# Circadian rhythm influence on weight and exercise performance

CLOCK is an essential element of the human biological clock and is involved in metabolic regulation. Your biological clock can influence the time of day you are likely to achieve your best performance.

Your day-night cycle (i.e. when you are awake and when you go to sleep and how well you sleep) plays a major role in regulating hormone levels such as insulin and cortisol, appetite control, weight management and overall health. Your genes plus your environment determine your unique circadian rhythm.



## Your results

Your CC genotype also puts you at elevated risk for having increased snacking behaviour and a more sluggish metabolism in the evenings.

.....

### Preference



MORNING PREFERENCE



## Outcomes

Adopt sleep hygiene principles (avoid any screen time 2 hours before bed, sleep in a dark room), and opt for your main meal earlier in the day. Do your training sessions in the afternoon or early evening.

GENE VARIATION

GENERESULT

CLOCK 3111 T>C

There was no gene impact for clock in Kalbe - should it just be gene result as the preference is shown above?





## Bitter taste

Taste is an important determinant of food acceptance or rejection behaviour. Interindividual variability in bitter taste sensitivity can strongly influence food preferences, nutritional status, and health.



### Your results

This combination of genotypes for the TAS2R38 gene results in a 'super taster' phenotype, meaning individuals are highly sensitive to the bitter compounds in food. Super tasters have been associated with having a decreased intake of vegetables, especially dark green leafy vegetables, and a preference for sweet foods. There has also been a link with super tasters and an increased risk for having a higher BMI, and possibly colon cancer. Increase awareness of this preference, and encourage vegetable intake. More palatable vegetable options with the use of other ingredients may improve compliance.

### Sensitivity



TYPICAL

ELEVATED



### Outcomes

Choose young vegetables, earlier in the season that are less bitter. Prepare vegetables with herbs and spices to make them more palatable.

GENE VARIATION	GENE RESULT	GENE IMPACT
TAS2R38 Pro49Ala		
TAS2R38 Ala262Va		
TAS2R38Val296Ile		







## Sweet tooth

Having a “sweet tooth” can be described as craving, or seeking out, sweet foods. This has been linked to an increased risk for being overweight/obese.



### Your results

Your genotype combination influences your ability to taste sweet foods, and may contribute toward you having a “sweet tooth”, described as craving, or seeking out, sweet foods.

.....

### Sweet tooth



TYPICAL

ENHANCED



### Outcomes

It is important to try to completely avoid all high-sugar foods such as sweets, pastries, cakes and sweetened beverages. It would also be prudent to avoid artificially sweetened foods and drink to help sensitise your ‘sweet’ taste buds.

GENE VARIATION	GENE RESULT	GENE IMPACT
TAS1R2 Ile191Val G>A		
SLC2A2 Thr110Ile C>T		





## Snacking and satiety

Satiety can be described as the feeling of fullness after a meal. Some individuals have an increased tendency to snack more often and to experience reduced feelings of satiety



### Your results

You may have a tendency for increased snacking behaviour and experience reduced feelings of satiety.

.....

#### Snacking behaviour



TYPICAL

ELEVATED



### Outcomes

Try not to skip meals, opt for healthy snacks such as vegetables and fibre-rich foods, and make use of mindful eating techniques (sit at a table for all meals, eat only what is plated, don't eat on-the-run or in front of the TV, don't snack directly from the cupboard or fridge).



### Food sources

#### Healthy snacking

REPLACE	WITH
Ice cream with toppings	Low fat yoghurt with berries
Pizza slice	Sandwich with animal protein and vegetables
Pasta salad	Fresh vegetables with low fat dip
Nachos and cheese dip	Whole wheat crackers
Potato crisps	Popcorn original

GENE VARIATION	GENE RESULT	GENE IMPACT
TCF7L2 C>T		
MC4R V103I T>C		
FTO T>A		



## Exercise response



### Exercise requirements for weight loss

Many people believe that if they are doing some sort of exercise and eating healthy, they will lose weight. In theory this is correct, but our genes tell a bit of a different story. Surprisingly, the amount and intensity of exercise you do, can play a key role in whether your weight loss journey will be successful.



#### Your results

In order to gain the most value from exercise in terms of weight loss, a MODERATE-INTENSITY exercise program of 3 x 60-minute sessions a week is suggested for you. These can be broken down into 6 x 30-minute sessions or other possible variations.

.....

#### Intensity



HIGH



#### Outcomes

Try aiming to reach your step goal daily - achieving 10 000 steps per day will be of significant benefit, and aiming for a minimum of 24 MET Hours of exercise per week (split into 4 to 5 sessions) will optimise weight management.

One of the most important elements is the intensity of your workout. But how do you know if you're working at a moderate intensity level?

There's no precise definition, but there are ways to monitor how hard you're working: for example, if you are working at a moderate intensity level, you should be short of breath and not able to speak more than one sentence at a time. If you can hold a steady conversation during your training, you have not reached the desired moderate intensity.

The energy expenditure will be different for every single person as it depends on a multitude of factors such as age, gender, body composition, and current level of fitness. Something that might seem very easy for you, may be much more difficult for someone else.

GENE VARIATION	GENE RESULT	GENE IMPACT
ADRB2 Arg16Gly A>G		
ADRB2 Gln27Glu C>G		
ADRB3 Trp64Arg T>C		
FTO T>A		
PPARG Pro12Ala C>G		





## Endurance and power potential

Some people respond better to specific exercises than others. This is because our unique genetic profile can affect physiological processes that impact the amount of benefit we each get from power or endurance training. Power uses strength to overcome resistance, while endurance refers to sustained effort with no reduction in performance. Power or anaerobic exercise are generally short in length with high intensity. Power exercise breaks down glucose for energy without using oxygen i.e. a lot of energy is released within a small period and your oxygen demand surpasses the oxygen supply. Power sports such as Olympic lifting, long jump and shotput, require a huge amount of explosive force.

Endurance training or aerobic exercise (also known as “cardio”) requires pumping of oxygenated blood by the heart to deliver oxygen to working muscle. It stimulates the heart rate and breathing rate to increase in a way that can be sustained for the entire exercise session. Examples include cardio machines, cycling, running, swimming, walking, hiking, aerobics classes, dancing, cross country skiing and kickboxing. Consider your genetic results in the context of your current health and performance goals and tailor your exercise plan appropriately, keeping in mind the importance of sport-specific training.



### Your results

You are likely to have enhanced performance benefits from a well-balanced ratio of both long duration endurance-style exercises as well as high intensity, short duration power exercises.

### Training potential



### Outcomes

The types of aerobic training to include are running, cycling, swimming, or similar types of moderate cardio exercise of long duration, at a steady pace, as well as short duration interval and sprint training, enhancing your power potential. Your strength focused weight training may include conventional free weights, machines or even weightlifting movements. Power-based plyometric exercises are also important for individuals wanting to develop explosive strength and speed. With weight training, it is important to develop basic muscular strength first, before building up to heavy weights in order to avoid injury. Low intensity weight training can be used to improve muscle contraction efficiency. This involves doing multiple repeats with relatively light weights (30 – 40% of maximum). You do have the potential to progress to high intensity weight training; low number of repeats with relatively heavy weights (60 – 70% of maximum). As someone who has mixed endurance and power potential, we recommend a range of activities that include endurance efforts at Zones 1-3 of the Cardio Zones Training Table as well as speed and interval training at levels 4 and 5. Your core sessions should be moderate duration interval sessions at levels 3 and 4.

GENE VARIATION	GENE RESULT	GENE IMPACT	
		power	endurance
AGT T>C			
ACE I>D			
BDKRB2 C>T			
VEGF C>G			
NRF2 A>G			
PPARGC1A G>A			
PPARA G>C			
ADRB2 Arg16Gly			
ADRB2 Gln27Glu			
TRHR C>T			
ACTN3 R>X			
VDR TaqI T>C			





# Muscle cramping susceptibility

Muscle cramps are sudden, involuntary contractions that occur in various muscles. A sudden, sharp pain, lasting from a few seconds to 15 minutes, is the most common symptom of a muscle cramp. In some cases, a bulging lump of muscle tissue beneath the skin can accompany a cramp. Muscle cramps have several causes. Some cramps result from overuse of your muscles during exercise. Muscle injuries, poor circulation and dehydration can also trigger cramps. Low levels of any of the following minerals that contribute to healthy muscle function may also cause muscle cramps: calcium, potassium, sodium, or magnesium.



## Your results

According to your genetic profile, you are less likely to suffer from muscle cramps than the average person.

### Risk



TYPICAL

ELEVATED



## Outcomes

Take proactive steps to avoid cramping. Warm-up sufficiently and stretch before exercising. In general, lower caffeine intake, stay hydrated, and increase calcium, potassium and magnesium intake.

GENE VARIATION	GENE RESULT	GENE IMPACT
AMPD1 G>A		

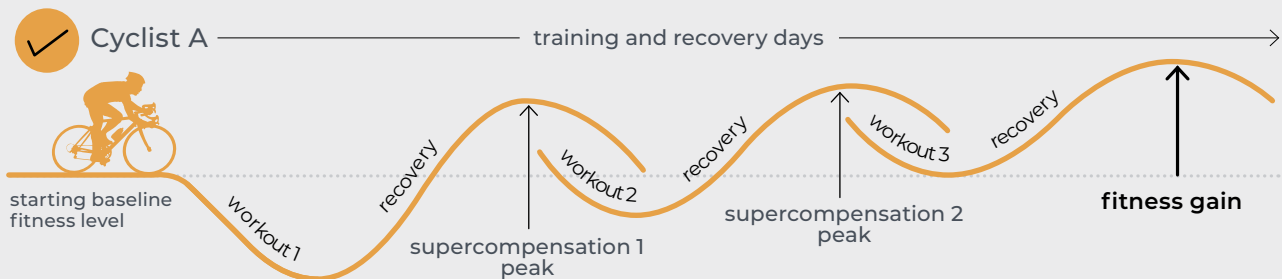




## Recovery from exercise

There are limits to how much stress the body can tolerate before it breaks down and risks injury. Doing too much work, too quickly will result in injury or muscle damage, but doing too little, too slowly will not result in any improvement. Building recovery time into any training program is important to let the body adapt to the stress of exercise. Recovery also allows the body to replenish energy stores and repair damaged tissues. When you go for a run, lift weights, or play football, any discomfort tells the body that it needs to be better equipped to deal with the situation. The response: it becomes stronger, bigger, or more efficient – this is called supercompensation and it is why we exercise.

### Proper training: supercompensation



### Incorrect training



This process is natural and normal, but it is easy to disrupt it with too much exercise. The ability to sustain many intense training sessions comes from a mixture of good genetics and slowly building a training foundation over the course of many years. If you have already been training at a high level for some years, take this as an indication that your body can theoretically handle high loads of exercise under ideal conditions. Otherwise, it is suggested that you build up to this level slowly.





### Your results

Your genotype shows that you are likely to recover at a slow rate from hard exercise.

.....

### Recovery



TYPICAL

SLOW



### Outcomes

It is important to progress your training at an appropriate rate and provide sufficient recovery time in order to be ready for your next training session. You should follow planned recovery strategies to gain the best returns from your training and optimise performance. Sleep is vitally important for recovery and you should look to obtain enough sleep so that you feel refreshed upon rising in the morning. Managing your nutrition is also important for optimal recovery. Because inflammation and oxidative stress influence recovery rates, you should look to consume mostly anti-inflammatory and anti-oxidant foods in your diet and avoid those that are pro-inflammatory. Focus on fruits and vegetables of many different colours; green leafy vegetables and cruciferous vegetables have particularly good anti-oxidant properties. Include fish in your diet; ensure that you are meeting adequate levels of omega-3 intake or you may wish to consider supplementation. Consuming carbohydrate based beverages during prolonged exhaustive exercise can help to reduce levels of inflammatory cytokines such as IL-6 and CRP following exercise. Consumption of a mixed protein and low GI carbohydrate meal after exercise is also known to decrease inflammation and assist recovery. Long term, regular, light and moderate intensity exercise leads to an increase in function of anti-oxidant enzymes, as well as decrease in baseline inflammatory cytokines: beneficial to exercise training, performance and optimal health. Avoid smoking of any kind.

GENE VARIATION	GENE RESULT	GENE IMPACT
IL-6 -174 G>C		
IL6R A>C		
CRP G>A		
TNFA -308 G>A		
MnSOD/SOD2 47 T>C (Val16Ala)		
eNOS 894 G>T		





# Risk for soft tissue injuries

To optimize performance in sport, athletes must maximize the stiffness of the musculoskeletal system. This stiffness is directly related to the individual’s movement economy. In other words, the greater the musculoskeletal stiffness, the better the performance. However, when the tendon is stiffer than the muscle is strong, the protective effect of the tendon is lost and the chance of an injury increases. Genes involved in the structural integrity and remodelling of soft tissues such as tendons and ligaments can be implicated in the risk of injury. These soft tissues are made up predominantly of collagen which has many important functions in the body, including providing your skin with structure and strengthening your bones. Collagen also helps maintain the integrity of your cartilage, which is the rubber-like tissue that protects your joints.



## Your results

You are at high risk of developing a soft tissue injury and need to be taking preventative steps against potential injuries.

.....

### Injury risk



TYPICAL

ELEVATED



## Outcomes

Resistance, weight and flexibility training can assist with injury prevention and rehabilitation if an injury does occur. Ensure adequate intake of vitamin C, iron and protein as these are necessary for collagen turnover. Consuming bone broth or supplementing with hydrolyzed collagen will also help.

GENE VARIATION	GENE RESULT	GENE IMPACT
COL1A1 1546 G>T		
GDF5 C>T		





# Appendix

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## Factsheets

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- Diet type for weight management
- Exercise and MET hours for weight management
- Improving sports performance





# Diet type for weight management

## Low carbohydrate diet

Low carbohydrate diets have a positive impact on obesity, serum lipids, impaired glucose metabolism and hypertension, but it is important to understand what constitutes a low carbohydrate diet. There is no need to completely cut out carbohydrates from the diet; the same positive results can still be achieved with a smaller intake of carbohydrates as described in the recommendations below.

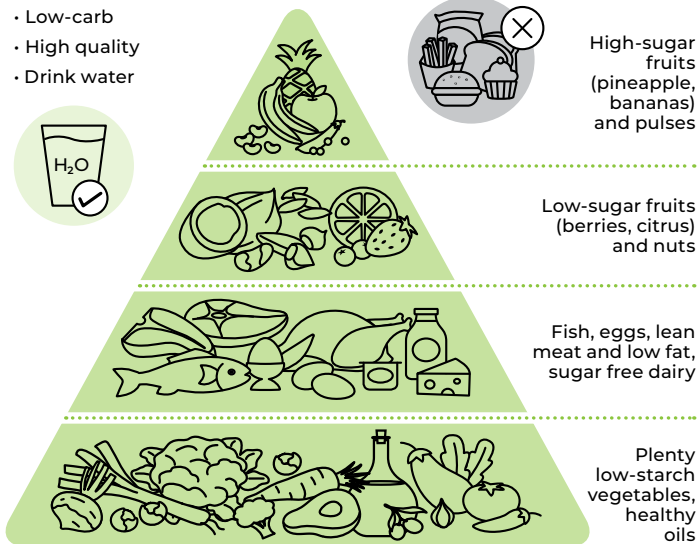
A low carbohydrate diet limits intake to 30-130g of carbohydrates per day that are unrefined and of good quality,, usually starting with the lower level in the first week or two, increasing to 60-70g/day by week three, eventually maintaining approximately 100-130g/day.

### WHAT IS A CARBOHYDRATE?

CARBOHYDRATES			
STARCH	SUGAR	FRUIT	DAIRY
Bread, potato, rice, couscous	Honey, white and brown sugar, sweets	Apples, pears, berries, melon, peaches	Yoghurt, milk

### FOOD GUIDE PYRAMID

- Low-carb
- High quality
- Drink water



High-sugar fruits (pineapple, bananas) and pulses

Low-sugar fruits (berries, citrus) and nuts

Fish, eggs, lean meat and low fat, sugar free dairy

Plenty low-starch vegetables, healthy oils

### THE DIET IS BEST DESCRIBED AS:

- Refined carbohydrates, most whole-grains and all sugars should be avoided, including natural sugars.
- Carbohydrates will be consumed in an array of vegetables and fruits, legumes, seeds and nuts, and dairy. All these foods do contain an amount of carbohydrates and need to be accounted for in your diet plan.
- Avoid starchy vegetables as they are high in carbohydrates and include leafy green vegetables where possible. Fruit will also be restricted.
- Fat intake should focus on mono-unsaturated fatty acids, mostly from olive oil, and omega 3 polyunsaturated fat-rich foods such as fatty fish.
- Eat 3 meals and 2 snacks a day - never skip meals.
- Avoid drinks and foods with artificial sweeteners, and ensure adequate intake of water.
- Learn to read food labels. Most food contains carbohydrates and you need to learn to identify foods that contain hidden carbohydrates, especially sugar. As an example, tomato sauce and salad dressing are both very high in sugar.





## Exercise and MET hours for weight management

Below you will find a detailed explanation of exactly what MET HOURS are, and a guide to plan your exercise week to meet your recommended MET HOURS. Remember to consult your healthcare practitioner before embarking on a new exercise programme, and to stop exercising if you feel nauseous or short of breath.



### What is a MET?

MET stands for Metabolic Equivalent Task. METs are a **way to measure how much energy you burn up during any chosen physical activity**. Every activity, from watching TV to going for a run, has a MET value. The more vigorous the activity, the higher the MET value.



### What are MET HOURS?

Whereas METs are a way to measure the intensity of a particular activity, MET HOURS **allow you to calculate how many hours of your chosen activities you need to do** in a week.

## Three easy steps to calculating your weekly MET HOURS score

Refer to your exercise requirements, and to the table of activities divided into light, moderate and vigorous intensity on page 17.

**1 Match your activity of choice to the exercise description** to determine whether you are reaching your recommended amount of physical activity in MET HOURS. Try to balance high intensity sessions with light to moderate exercises to assist with recovery and decrease risk of injury and 'burning out'.

**2 Use this equation to calculate the MET HOURS for each activity:**

**MET VALUE x DURATION = MET HOURS SCORE (in hours)**

For example, if you play singles tennis for 1 hour and 40 minutes (1.60 hours):  
 $8 \text{ METS} \times 1.60 = 13 \text{ MET HOURS}$

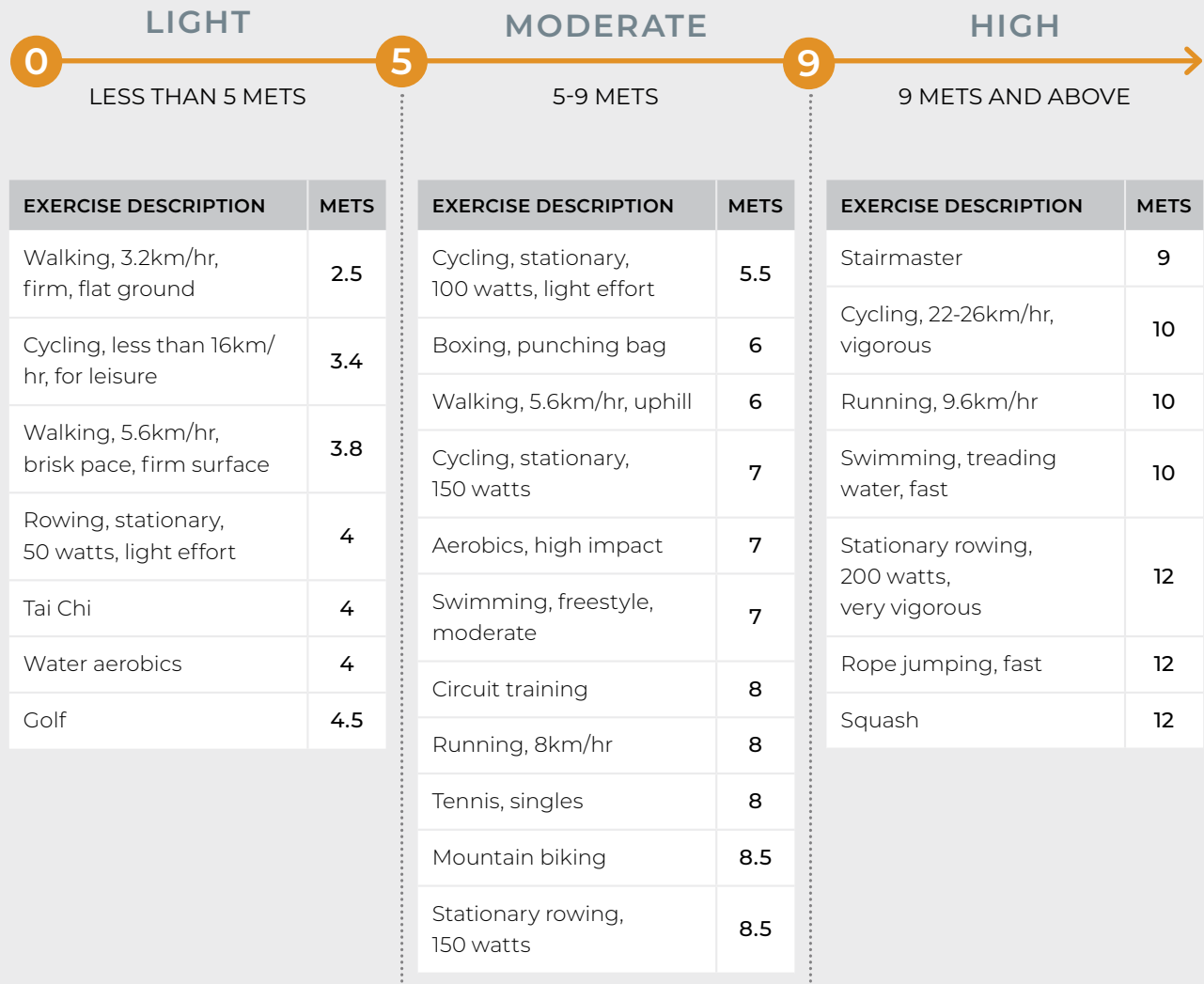
**3 To calculate your weekly MET HOURS SCORE:**

**Add the MET HOURS SCORE of each workout for that week**

For example, if you played singles tennis for 1 hour and 40 minutes, ran for 30 minutes at a pace of 8 km/hour ( $8 \times 0.5 = 4$ ) and played 2 hours of golf ( $4.5 \times 2 = 9$ ), then your weekly MET HOURS SCORE will be 26 ( $13 + 4 + 9$ )

## Table of activities:

Exercise intensity for 1 hour of exercise:



**Talking during exercise is a reliable way to measure your exercise intensity:**

- If you can talk without puffing at all, you're not pushing too hard and it's very likely a **light intensity** activity.
- If you can talk but not sing, you're exercising at a **moderate intensity**.
- If you can't talk without gasping, then you are exercising at a **high intensity**.





## Improving sports performance

### Cardio zone training table

If you are training with a heart rate monitor, use it to stay within range of the suggested heart rate percentages.

Calculating  
your target  
heart rate:



Maximum heart rate =  $220 - \text{age}$








Heart rate reserve = maximum heart rate – resting heart rate



Target heart rate =  $(\text{heart rate reserve} \times \text{training \%}/100) + \text{resting heart rate}$

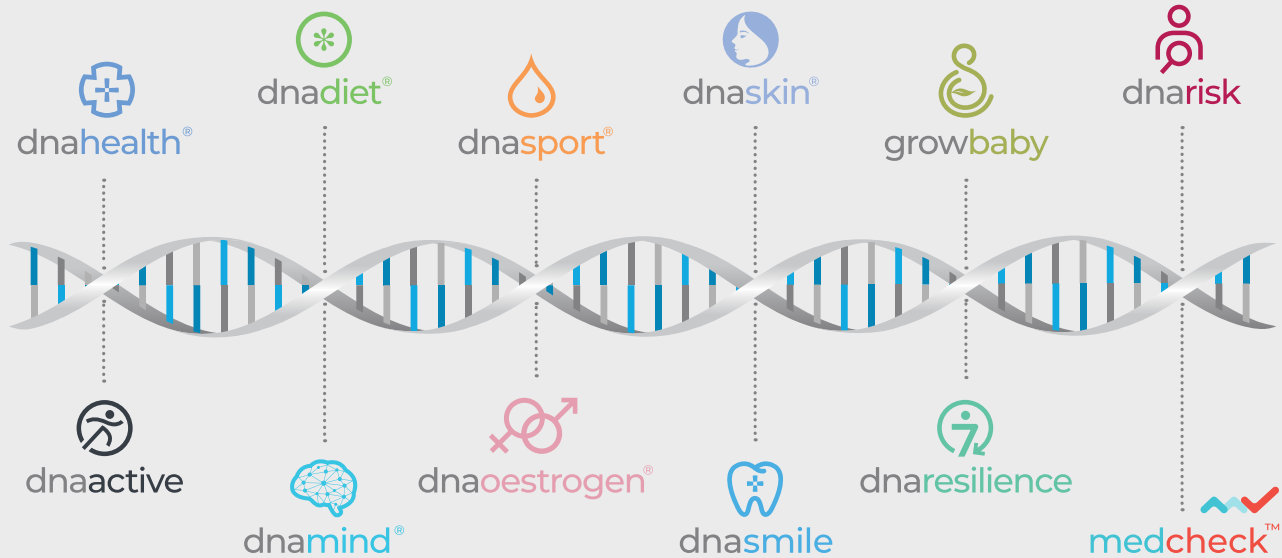
If you are not training with a heart rate monitor, choose which zone you think you are in by assessing how you feel during the workout. Does it seem quite light and can you keep a conversation going? Or are you gasping for air throughout the entire session?

ZONE	HEART RATE (target heart rate)	EFFORT / FEEL	BENEFITS
1	 95 - 114 (50 - 60%)	Very light	<b>Improved overall health:</b> body fat decreases, blood pressure and cholesterol are lowered, muscle mass increase, and helps recovery.
2	 114 - 133 (60 - 70%)	Light	<b>Improved basic endurance:</b> gain muscle and lose fat mass, strengthen heart muscle, fat utilization zone.
3	 133 - 152 (70 - 80%)	Moderate	<b>Improved aerobic fitness:</b> increase in the number and size of blood vessels, increased lung capacity and respiratory rate, as well as an increase in size and strength of the heart muscle.
4	 152 - 171 (80 - 90%)	Hard	<b>Increased maximum performance capacity:</b> high total calories burned during exercise. Large amount of carbohydrates used for energy production. Improved lung capacity and higher tolerance for more strenuous exercises.
5	 171 - 190 (90 - 100%)	Very hard	<b>Develops maximum performance and speed:</b> Highest total calories burned, but lowest percentage of fat calories. Spending too much time in this zone, even for elite athletes can be painful, cause injuries and lead to over training.



# A lifetime of optimal health awaits you

Your genes do not change, which means our laboratories will only ever need one sample\* from you. Throughout your life, as your health goals and priorities change, we can continue to provide valuable health insights from this single sample\* to support your unique health journey.



\*Requires finger prick blood spot sample collection

## Our Commitment

**DNALysis Biotechnology** is continuously developing new tests with the highest standards of scientific rigour. Our commitment to ensuring the ethical and appropriate use of genetic tests in practice means that gene variants are only included in panels once there is sound motivation for their clinical utility and their impact on health outcomes.

**ADVANCED** | **ACTIONABLE** | **APPROPRIATE**  
technology interventions use in practice

From the laboratories of:

**DNALYSIS**  
Biotechnology

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**Risks and Limitations:**

DNALysis Biotechnology has a laboratory with standard and effective procedures in place for handling samples and effective protocols in place to protect against technical and operational problems. However as with all laboratories, laboratory error can occur; examples include, but are not limited to, sample or DNA mislabelling or contamination, failure to obtain an interpretable report, or other operational laboratory errors. Occasionally due to circumstances beyond DNALysis Biotechnology's control it may not be possible to obtain SNP specific results.