27/10/2020

EUROGENETICA

NUTRIGENE+

Personal report:

NutriGENE+

by Eurogenetica

www.nutrigene.it

Name:	
Date of Birth:	**14/04/1960**

Contents

Section I: OPTIMAL Nutrition

Thank you for taking the Eurogenetica NutriGENE program – this section will give you your results and all you need to know about how to make useful modifications to your diet and lifestyle in order to benefit your health and wellbeing. You should read the report carefully and also discuss it with your nutritionist who will be able to help you to plan the recommended changes. If you need to lose weight please also consult section II.

Overview – Modifications to introduce

Increase*	Folic Acid, Vit B6 & B12 Vitamin D Calcium Cruciferous Omega 3 Fibre Olive Oil
Decrease*	Salt Saturated Fats Refined carbs / sugars Grilled Meat
Lactose intolerance	Lactose intolerant
Celiac	possible predisposition
Eating behaviour	Take care of sleep Moderate snacking & craving predisposition

*To increase or decrease relative to the official RDA guidelines

Results

Biological process	Gene	Variant tested	Result		Action
Carbohydrate: • Metabolism • Transport • Energy	ACE	ID	DD	**	Limit intake of refined carbohydrates: glycemic load <70 / day; consume at least 30 g/day fibre
	PPARG	ProAla (12)	Pro-Pro	**	
	TCF7L2	C/T	TT	**	
	ADRB2	Arg16gly	Gly-Gly	**	
	CLOCK	3111T/C	CT	*	
	PLIN	11482G>A	GG		
	INSIG2	G/C	GC		
Lipids: • Metabolism • Transport • Energy	APOC3	C3175G	CG	*	Limit saturated fat intake to < 16g / day Increase olive oil intake
	APOA5	-1131T>C	AA		
	APOA2	-265T>C	TT		
	LPL	C1595G	CC	*	
	CETP	279G>A	TT		
	LEPR	Lys656Asn	AA		
	MC4R	C/T	TT		
	PLIN	11482G>A	GG		
	FABP2	Ala54Thr	Ala-Ala		
	FTO	A/T	AA	**	
Oxidative stress & detoxification • DNA damage • Free radicals	GSTM1	deletion	D	**	Consume 3-4 servings of cruciferous per week Limit intake of grilled meat Standard recommendation for antioxidants Increase Selenium: 90 mcg / day
	GSTT1	deletion	I		
	CYP1A2	–163A>C	AA	**	
	EPHX1	Tyr113His	Tyr/Tyr	**	
	CAT	C-262T	CC		
	GPX	Pro198Leu	Pro/Leu	*	
	SOD2	C-28T	TT		
Inflammation	IL6	G -174C	GG		Intermediate: 2 g Omega 3 / day
	IL6R	AC (AspAla)	CC	**	
	CRP	1082CT	CC	*	
	TNF	G-308A	GA	*	

Vitamin B Metabolism	**MTHFR**	C677T	CT	*	Intermediate: at least 400 µg folic acid, 10 mg Vit B6, 15 µg Vit B12 per day
		A1298C	CA	*	
Vitamin D **Calcium**	**VDR**	C>T (taq1)	TC	*	Increase: 800 IU / day Vitamin D
	COL1A1	G Sp1 T	GT	*	
Salt sensitivity	**ACE**	ID	DD		Intermediate sensitivity to salt, <2,000 mg / day sodium
	AGT	TC(Met/Thr)	TC	*	
Alcohol metabolism	**ADH1C**	Ile349Val	AA Ile/Ile	**	Reduced beneficial effect of alcohol on cholesterol
Caffeine metabolism	**CYP1A2**	–163A>C	AA		Standard recommendation
	VDR	C>T (taq1)	TC	*	
Lactose intolerance	**LCT**	-13910-CT	CC	*	Lactose intolerant
Gluten / Celiac	**DQ2/8**		Positive		Possible predisposition for celiac disease
Sleep **Eating Behaviour**	**CLOCK**	3111T/C	CT	*	Try to sleep well, and longer if you don't sleep much Eat breakfast earlier, and don't take late lunches or dinner. Moderate snacking & craving predisposition Careful with your snacking, avoid high calories snacks. Care with binge eating
	FTO	A/T	AA	**	
	MC4R	C/T	TT		
	LEP	G-2548A	GG		
	LEPR	Lys656Asn	AA		
	GHRL	Leu72Met	GG		

BMI

According to your Eurogenetica assessment, your body mass index is classed as normal.

As you go about balancing your body mass index, Eurogenetica recommends a mean BMI between (19 and 25) in order to reduce the potential for elevated cytokines, inflammatory substances, which can be harmful to the body in excess levels. Your genetic profile has shown that you have the variations in your immune support genes which can lead to elevated levels of these cytokines. You also have variations in genes which are associated with less than optimal balancing of insulin and glucose levels which can be supported by a normal BMI.

BMI Classification	Min	Max
Obese class III	≥ 40,00	
Obese class II	35,00	39,99
Obese class I	30,00	34,99
Overweight	25,00	29,99
Normal	18,50	24,99
Underweight	16,00	18,49
Seriously underweight		<16,00

World Health Organization - BMI classification
http://apps.who.int/bmi/index.jsp?introPage=intro_3.html

3 Sleep & Eating Behaviour

Circadian Locomotor Output Cycles Kaput (CLOCK), is involved with our internal biological clock, called the circadian rhythm, to help us adapt to the dark & light daily cycles. These can affect many physiological functions including blood sugar, metabolism, etc. It also seems to be related to time of eating and morning fatigue. CLOCK is also associated with eating behaviour as are the other genes in the table below.

Eating behaviour can manifest in related processes: snacking, binge eating, constant craving, emotional eating (tendency to overeat in response to negative emotions - experts estimate that 75% of overeating is caused by emotions). Certain variants of the genes below are associated with snacking, binge eating (often emotionally related leading to "comfort" eating of junk foods). Healthier ways to view food and develop better eating habits recognize their triggers for engaging in this behaviour and develop appropriate ways to prevent and alleviate stress – also exercise is good for managing stress.

Gene	Result	Effect
CLOCK	CT	*
FTO	AA	**
MC4R	TT	
LEP	GG	
LEPR	AA	
GHRL	GG	

CLOCK: take care of your sleep. Try to have breakfast early and not have late lunch or dinner.
According to your genetic results you have a MODERATE snacking & craving predisposition. Avoid snacking on high calories foods.
Exercise is good for managing stress – see your P/E exercise result below.

The best way of eating is to adhere to a Mediterranean diet which is naturally low in saturated fat and refined carbohydrates. If you are trying to lose weight, or maintain your current weight remember that Late lunch eaters lost less weight and displayed a slower weight-loss with your genotype. When you are eating between meals, snacking or even binge eating, make sure that the food you eat is nutritious, filling & healthy. It should not be full of mainly nutrition-less calories – high fat and sugar content that are too often available in snacks. Make your snacking, like your meals, healthy: fruit & vegetables can make good and tasty snacks!
Manage your stress, regular exercise is very helpful, and use the P/E algorithm in this report to make your exercise better and more comfortable.

4 The Eurogenetica P/E Algorithm

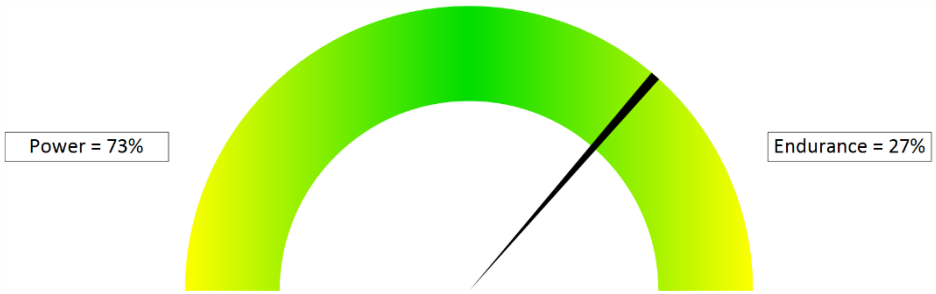
Exercise is important to everyone – to live longer and in better health. Many don't do enough exercise, sometimes they start with good intentions and quickly give up. There are of course many reasons for this. One important feature is the TYPE of exercise to do. The Eurogenetica P/E Algorithm was developed over 10 years ago and has been constantly refined over time. It was developed mainly for sports & fitness devotees and has been shown in studies to improve training response about 3x better when exercise is fitted into your genetics*

Now it can be used for anyone – it helps you to exercise better and feel more comfortable doing so. Slight changes in your routine can lead to substantial changes especially in "not giving up". We look at variants in genes that are associated with response to exercise - in hundreds of studies – and we combined them into a score-based algorithm to detect your genetic balance between power & endurance activities. IMPORTANT – this is NOT a measure of how well you will do in sports, it has nothing to do with talent or whether you will excel in a particular sport. It is to help you to find the right balance in whatever exercises you wish to do – so that you will feel more comfortable during and after exercising. It works!

Endurance is the ability of athletes to exert themselves for relatively long periods of time. The definition of endurance varies according to the type of physical activity the athlete is engaged in. Power athletes exert high amounts of energy in short bursts. High intensity power activities may be measured in minutes, whereas low intensity endurance activities may be measured in hours or days. Understanding your genetic background can help you determine what type of exercise regimen may be most appropriate for you. Athletes at the very top of their "game" tend to have a specific set of genetic variations that are characteristic of endurance and power activities.

*A genetic-based algorithm for personalized resistance training' by Jones N, Kiely J, Suraci B, Collins DJ, de Lorenzo D, Pickering C, Grimaldi KA. Biol Sport. 2016;33(2):117-126 http://biolsport.com/text.php?ids=101125

Your P/E balance



The meter gives you an indication of where you fall in the power-endurance spectrum based on your personal genetics. Exercising only for endurance can have a negative impact on the ability to exert strength unless an individual also undertakes resistance training and training solely for power activities can have a negative impact on the ability to sustain exercise for longer lengths of time, so it's important to balance these types of exercise with cross-training programs. You can use your results to find an optimal balance between resistance and endurance exercises during your training routine

POWER			ENDURANCE		
Gene	**Result**	**Effect**	**Gene**	**Result**	**Effect**
ACE	DD	●●	ACE	DD	-
AGT	CT	-	ADRB2	GG	-
ACTN3	CC	●●	ACTN3	CC	-
TRHR	CA	-	BDKRB2	CC	-
PPARA	GG	-	COL5A1	CT	-
VEGF	CG	-	NRF	AA	-
VDR	CT	-	PPARGC1A	GG	●●
IL6	GG	●●	PPARA	GG	●●
			CRP	CC	-
			VEGF	CG	-

Your assessment has determined that your genetic profile falls more in the zone of power activities, based on variations in your genes.

Make the most of your tendency to respond well to power activities by exploring a number of power/strength exercises

Nutrient sensitivities

LACTOSE INTOLERANCE

Lactose is digested by an enzyme called lactase – in many parts of the world the presence of this enzyme decreases significantly after the first few years of life resulting in reduced ability to digest lactose. In Europe a genetic variation results in lactose persistence, i.e. the continuing ability throughout life to digest lactose however in Italy the prevalence of lactose intolerance is common.

Your Result, CC, means that you, like the majority of the world population, do not possess the variant that causes lactase persistence therefore it is strongly recommended that you avoid all lactose.

Gene	Result
LCT	CC
Reduce or avoid lactose	

COELIAC PREDISPOSITION

Certain genes that code for proteins involved in the immune system response to antigens (bacteria, foreign bodies, etc) are also involved in the mechanism by which Coeliac disease manifests itself. Celiac disease is a particular form of permanent intolerance to gluten, which is composed of the proteins gliadin and glutinin and is found in wheat, rye, barley and other grains. Testing for the genes involved can give an idea about the predisposition to the disease.

The results of your genetic test reveal that, even though the risk is not high, it is not possible to exclude a predisposition to Celiac disease. According to the scientific literature 1 person in 35 with your genotype result will develop celiac disease while the average in Italy is 1/100.

Gene	Result
DQ8	Positive
Possible predisposition for celiac disease	

Celiac disease predisposition also moderately raises the risks of developing other autoimmune diseases such as Type 1 Diabetes, Rheumatoid arthritis and thyroiditis. The increased relative risk is slight however the risk becomes significant if a direct family member (sibling, parent, grandparent, child) is or has been affected by any of these diseases.

A positive genetic test result does not mean that you will certainly develop celiac disease and it is not a reason for you to avoid gluten unless an intolerance has actually been diagnosed.

The "NutriGENES"

REFINED CARBOHYDRATES & SUGARS

Various studies have examined the relationship between genes, environment and lifestyle and how this affects glucose transport & metabolism, glycemia and insulin sensitivity. Genes for which there is strong evidence have been included in this panel – their additive effect a sensitivity score has been derived which can be useful for optimising recommended limits and levels of refined carbohydrates & fibre in your daily nutrition

Gene	Result	Effect
ACE	DD	**
PPARG	Pro-Pro	**
TCF7L2	TT	**
ADRB2	Gly-Gly	**
CLOCK	CT	*
PLIN	GG	
INSIG2	GC	

Limit intake of refined carbohydrates: glycemic load <70 / day; consume at least 30 g/day fibre

You have a **HIGH** sensitivity to carbohydrates – this is an overall measure of the potential effects of your combined genotype on aspects such as carbohydrate metabolism and assimilation, short term glucose fluctuations and longer term insulin sensitivity.

Based on the combined genotype of all genes related to lipid metabolism we offer the following nutritional advice:

- Max 6% total calories
- Max glycemic load = 70 / day
- Fibre = 30 g / day

WHAT IS GLYCEMIC LOAD AND GLYCEMIC INDEX?

Carbohydrates serve as one of the body's main sources of energy. How your body responds to the various carbohydrates in foods depends on the Glycemic Index (GI) of the food. Glycemic Index is a rating scale that defines carbohydrate-rich foods on a scale from 0 to 100. Foods are ranked according to how much they raise blood-glucose levels after eating. High GI foods are rapidly digested and absorbed, which may result in large swings in blood glucose levels. Low GI foods are digested and absorbed more slowly, and may result in more stable levels of blood glucose. Glycemic Load (GL) is a reference that takes into account the Glycemic Index of a food and the amount of the food that you need to eat to measure the full impact on your blood glucose levels. The higher the Glycemic Load, the greater the increase in blood glucose. To maintain long term health, consider consuming foods with a lower GL to help keep blood glucose levels steady in order to promote optimal health and well-being.

- **Consume whole grains. The fibrous coat of the hull or skin from grains slows down the digestion and absorption of carbohydrates. An example of a whole grain product is brown rice.**

- **Choose long-grain, brown rice as a staple because this variety of rice has the lowest GI compared to other rice.**
- **Pasta has a low GI, but a large portion can result in a high GL.**

LIPID METABOLISM

Many studies have demonstrated the effects of genetic variation on transport and metabolism of dietary saturated and unsaturated fats. The processes affected involve absorption through the intestine, transport in the blood, storage and conversion into energy. Research on the interactions between nutrition, lifestyle and genetics has clearly demonstrated that the effects of these genetic variants that can modify your lipid profile, raising / lowering cholesterol for example, depend on environmental factors and in particular the type and quantity of fats in your diet. The genes seected in this panel have an additive effect and a sensitivity score has been determined which can be used to modify your diet in a beneficial way.

Gene	Result	Effect
APOC3	CG	*
APOA5	AA	
APOA2	TT	
LPL	CC	*
CETP	TT	
LEPR	AA	
MC4R	TT	
PLIN	GG	
FABP2	GG	
FTO	AA	**

Limit saturated fat intake to < 16g / day. Your combined genotype for lipid related genes indicates a **MEDIUM-HIGH** sensitivity which affects various aspects including fat absorption from food in the intestines, transport and metabolism and the effect of saturated and unsaturated fats on your blood lipid profile.

Based on the combined genotype of all genes related to lipid metabolism we offer the following nutritional advice:

- Saturated fats = max 8% total calories
- MUFA = 15% total calories
- PUFA = 12% total calories

WHY IS OLIVE OIL IMPORTANT FOR YOUR HEALTH?

Olive oil is primarily monounsaturated fat, which is a type of fat that does not raise blood levels of LDL-cholesterol, which is also commonly called “bad cholesterol.” Olive oil contains natural antioxidants, which are good for our overall health and well-being. The monounsaturated fat in olive oil is comprised of oleic acid, which is the major fat typically found in the acclaimed Mediterranean diet.

HOW DO SATURATED FATS AFFECT YOUR HEALTH?

Fats provide us with a concentrated form of energy. They supply essential fatty acids the body itself cannot produce, help the body store energy, insulate tissues, and absorb fat-soluble vitamins and hormones. Fats are divided into two main groups: saturated and unsaturated. Saturated fats can raise LDL, or "bad" cholesterol levels. High LDL cholesterol has been linked to cardiovascular disease. Other fats to avoid are trans fatty acids because they can also increase the "bad" LDL cholesterol and lower the "good" HDL cholesterol. In contrast, unsaturated fats do not increase blood cholesterol and may, in fact, help to maintain normal blood cholesterol.

- **Olive oil is a very versatile monounsaturated fat that can be used for salad dressings and marinades, as well as for cooking and baking.**
- **When selecting an olive oil, choose one labelled "extra virgin" olive oil. This oil comes from the first pressing of the olives and is the least processed, with more antioxidants than the later pressings.**
- **Remember, although olive oil is considered good for you, it has as many calories as any other fat so use in moderation.**

DETOXIFICATION: GRILLED MEAT

CYP1A2 codes for a Cytochrome P450 enzyme that is involved in Phase I (activation) of removing toxins, such as carcinogens from food and smoke, it also metabolises caffeine.
Your genetic result for this gene (A/A) mean that you have two copies of the rapid version of the enzyme, which activates more rapidly potentially toxic substances present in meat cooked at high temperatures. You are advised therefore to keep grilled meat consumption down to about once/twice per week. The 'T' version of the EPHX1 gene codes for the fast activity enzyme.

Your genetic results put you at a higher risk of DNA damage from eating smoked or chargrilled animal protein. With these results it is advisable to limit your consumption of grilled or smoked meat to 1-2 servings per week.

Gene	Result		
CYP1A2*1F	AA	**	Limit intake of grilled meat
EPHX1	Tyr/Tyr	**	

HOW DO SMOKED AND CHAR-GRILLED MEATS AFFECT YOUR HEALTH?

Cooking certain meats at high temperatures creates the formation of chemicals that are not naturally present in uncooked meat. Examples of these compounds are the heterocyclic amines (HCA's) and polycyclic aromatic hydrocarbons (PAH's). Heterocyclic amines and polycyclic aromatic hydrocarbons are regarded as toxic compounds that can damage DNA and protein in your cells.

- **HCA and PAH compounds are formed when cooking muscle meats such as beef, lamb, pork, fowl and fish. These compounds form when amino acids and creatine react at high cooking temperatures.**
- **Foods cooked for a long time i.e. well done or very well done by all methods will form more HCA's.**

DETOXIFICATION: CRUCIFEROUS

GSTM1 & GSTT1 (glutathione S-transferases) are involved in phase II of the detoxification process by which toxins are removed from the body (via the conjugation of toxic molecules with glutathione, facilitating their elimination). According to genetic variation the enzyme activity is either present (Insertion or "I") or absent (Deletion or "D").

– in your case you have the D (deleted) version of the GSTM1 gene which means that no GSTM1 enzyme is produced. You can compensate by adding extra portions of cruciferous vegetables and consume on average at least 3-4 portions per week. It is also recommended that you add frequent consumption of allium vegetables (garlic, onions, etc) to your diet.

Gene	Result		
GSTM1	D	**	Consume 3-4 servings of cruciferous per week
GSTT1	I		

WHY ARE CRUCIFEROUS VEGETABLES IMPORTANT FOR YOUR HEALTH?

Cruciferous vegetables contain substances called glucosinolates. According to the latest medical research, glucosinolates help maintain cellular and cardiovascular health. Cruciferous vegetables promote the normal activation of detoxification enzymes, which support your body in the removal of dangerous toxins.

- **The cruciferous vegetables are named for their cross-shaped flowers. A major subgroup of cruciferous vegetables is the Brassica, which includes cabbage, brussel sprouts, broccoli, cauliflower, kale, kohlrabi, turnips and watercress**
- **vitamins, minerals and special health-promoting compounds these vegetables contain.**
- **All cruciferous vegetables are ideal for stir-frying, which allows the vegetables to retain their color, crunchiness and unique natural flavor. Cruciferous vegetables can also be lightly steamed.**

OXIDATIVE STRESS

The gene SOD2 codes for an enzyme called manganese superoxide dismutase. This enzyme is important in protecting the cell environment from internally generated oxidative free radicals, especially those generated during energy production. Each cell in the body during normal metabolism generates large quantities of free radicals; these are highly reactive species which can damage cell components such as lipid membranes, proteins and DNA. However they are rapidly removed by the several protective mechanisms, one of which involves SOD2. Together with catalase (CAT) and glutathione peroxidase (GPX, a selenoprotein), these enzymes constitute a primary defense against oxidative stress.

Your genetic test results indicate the possibility of a moderately reduced capacity to neutralise free radicals. Dietary anti-oxidants are very important sources of protection from free radicals and other types of oxidative stress. In order to support your body's own protection mechanism, it is important for you to ensure that you reach your goals for vitamins A, C and E and selenium.

Gene	Result	
SOD2	TT	
CAT	CC	
GPX1	Pro/Leu	*

Standard recommendation for antioxidants
Increase Selenium: 90 mcg / day

WHY ARE VITAMINS A, C AND E IMPORTANT FOR YOUR HEALTH?

Vitamins are composed of organic molecules essential for normal metabolism, growth, development and for the regulation of cell function. Because vitamins generally cannot be synthesized by human cells, essential vitamins must be supplied through your diet or in a supplement. As part of your diet we advise you to eat foods rich in vitamins A, C and E to help promote your antioxidant/detoxification functions.

- **Rich sources of vitamin C are citrus fruits, kiwi, guavas, strawberries, tomatoes, green peppers and alfalfa sprouts.**

GENERAL INFLAMMATION

Both IL6 and TNF are cytokines involved in the inflammatory process as part of the body's normal immune response and genetic in these genes variation (IL-6-174 G/C and TNF-308 G/A) affects the amounts of cytokines produced.

Your results show that you have normal expression for IL6 but are heterozygous for TNF (A/G) which can lead to increased cytokine levels. Your recommended intake of Omega 3 is greater the official guidelines at 2 g per day from food and a good quality supplement.

Gene	Result		
IL6	GG		Intermediate: 2 g Omega 3 / day
TNF	GA	*	
IL6R	CC	**	
CRP	CC	*	

WHY ARE OMEGA-3 FATTY ACIDS IMPORTANT FOR YOUR HEALTH?

A number of studies have shown omega-3 fatty acids promote cardiovascular health. These fats help maintain normal levels of plasma triglycerides and blood pressure and promote normal platelet (cell) activity. New research also shows omega-3 fatty acids can promote normal bone formation and help maintain bone density.

- **Salmon and walnuts are a good source of Omega-3.**
- **Plan to eat 2-5 servings of fish each week. When choosing fish, include the types with the highest oil content. If you don't get enough omega-3 fatty acids through diet alone, consider taking a high-quality supplement.**

VITAMIN B METABOLISM

The gene MTHFR codes for an enzyme that is involved in the metabolism and utilization of folic acid and the vitamins B6 and B12. The enzyme is central to key biochemical pathways that lead to DNA synthesis and DNA methylation.

You have the heterozygous 677C/T version of the MTHFR gene which produces an aggregate enzyme activity that is reduced compared to the 677CC genotype. This has been associated with increased homocysteine levels when dietary intake of folic acid is too low. The reduced activity can be compensated for by increased dietary folic acid, vitamin B6 & B12. You should increase your intake of these vitamins to reach your personal daily goals.

Gene	Result		
MTHFR677	CT	*	Intermediate: at least 400 µg folic acid, 10 mg Vit B6, 15 µg Vit B12 per day
MTHFR1298	CA	*	

WHY ARE B VITAMINS AND FOLIC ACID IMPORTANT FOR YOUR HEALTH?

Vitamins are organic molecules essential for normal metabolism, growth and development, and for the regulation of cell function. Since vitamins generally cannot be synthesized by human cells, essential vitamins must be supplied through food or supplementation. Certain B vitamins are particularly important and work in conjunction with folic acid to support heart health.

- **Folate occurs in large amounts in liver and in lower concentrations in beef, lamb, pork, dark green, leafy vegetables (such as spinach, turnip greens, broccoli, and asparagus), whole grains, wheat germ, avocados, dried beans, and peas, and citrus fruits, including orange juice.**

VITAMIN D METABOLISM

The vitamin D receptor binds Vitamin D and affects the production of several proteins, including some involved in calcium use. Deficiency of Vitamin D causes rickets, nowadays a rare disease, but vitamin D levels are important for bone structure.

You are heterozygous for this gene (C/T) which has been shown to affect calcium absorption and bone structure. You are advised to increase consumption, above the standard guidelines, to obtain at least 800 IU Vitamin D and 1300 mg Calcium.

Gene	Result		
VDR	TC	*	Increase: 800 IU / day Vitamin D
COL1A1	GT	*	

WHY IS VITAMIN D IMPORTANT FOR YOUR HEALTH?

Vitamin D helps maintain normal blood levels of calcium and phosphorus and supports normal calcium absorption, supporting the formation of strong bones. Although this vitamin is found in certain foods, vitamin D can also be created in the skin after exposure to ultraviolet (UV) rays from the sun. Without vitamin D, bones can become thin, brittle, soft or misshapen. Long-term vitamin D deficiency can increase the risk of osteoporosis-related fractures. The latest medical research suggests that, by addressing vitamin D deficiency with diet changes or supplements, bone density can potentially be maintained.

- **Exercise with weights is useful for promoting bone mineralisation.**
- **The body manufactures vitamin D when exposed to sunshine. Eurogenetica recommends getting fifteen minutes of sunshine three times a week as adequate exposure to ensure sufficient production of vitamin D.**
- **Fortified foods are the major dietary sources of vitamin D. The richest natural source is milk, followed by fish oils and fatty fish such as sardines, tuna, salmon, mackerel and herring.**

SALT SENSITIVITY

The ACE gene codes for an enzyme that has a key role in cardiovascular health because it is closely involved in the regulation of the processes of vasoconstriction and vasodilation. The ACE gene contains an "Insertion/Deletion" polymorphism (allele "I" = Insertion; allele "D" = Deletion), that influences enzyme activity. Recent studies have demonstrated and association between the genotypes I/D and I/I and Dietry salt sentivity affecting blood pressure.

Your genetic test reveals that you have the "D/D" and Met/Thr genotype and therefore a possible predisposition to hypertension when salt (specifically sodium) consumption is excessive. You are advised to limit your salt intake to a maximum of 5.0g/day, equivalent to about 2.0g/day sodium.

Gene	Result
ACE	DD
AGT	TC

Intermediate sensitivity to salt, <2,000 mg / day sodium

WHY IS SALT (SODIUM) IMPORTANT FOR YOUR HEALTH?

Salt is made up of sodium and chloride. It's the sodium content that's of most concern because it can cause high blood pressure in those genetically-susceptible. Historically, government agencies have stressed the importance of reducing sodium intake at or below 2300 milligrams (mg) per day. This amount of sodium translates as 1 teaspoon of salt per day and includes all the salt we add to our foods and the prepared foods we consume. In general, our commercial foods tend to be highly salted for flavor and it's a good idea for all of us to be aware of how much salt we ingest on a daily basis. However, for those susceptible to salt-sensitive high blood pressure, it's essential to cut back on salt and its sodium content.

- **Taste your food before salting it. You may not need the extra salt!**
- **Know where the hidden salt in foods is. Assume most convenience foods are high in salt content.**
- **Consider adding herb mixes to your food to enhance the flavor of your food without adding salt.**

ALCOHOL SENSITIVITY

Alcohol dehydrogenase 1C (ADH1C) metabolises alcohol, creating acetaldehyde which is a toxic substance responsible for some of the negative effects of excessive alcohol consumption. Acetaldehyde is itself metabolised by aldehyde dehydrogenase into non-toxic substances. The ADH1C gene polymorphism screened in NutriGENE causes an amino acid change in the protein sequence which affects enzyme activity.

The test results show that you are homozygous for the Ile (isoleucine) allele (genotype AA) which is characterised by the presence of isoleucine at a specific position in the protein. This results in a higher activity enzyme which metabolises alcohol more rapidly compared to the "Val" genotype (presence of the amino acid valine). Alcohol can have positive benefits on lipid levels, especially on HDL cholesterol, when consumed in moderate quantities. Moderation is particularly advised because the alcohol is rapidly metabolised to the toxic intermediate acetaldehyde which is also associated with hangover symptoms.

Gene	Result
ADH1C	AA Ile/Ile
Reduced beneficial effect of alcohol on cholesterol	

Moderate alcohol consumption

Limits of regular alcohol consumption as defined and endorsed by medical authorities and government health departments recommend no more than 14 units of alcohol per week for men, and no more than 7 units of alcohol per week for women. Furthermore, health departments now favor a daily limit of alcohol as opposed to a weekly limit of consumption. The daily limit of alcohol consumption would be a limit of 2 units per day for men and 1 unit for women. Regular consumption of alcohol is not a standard recommended by any scientific board or governing agency for health promotion.

A unit (drink) of alcohol is defined as:

12 oz ordinary strength beer / lager
1 glass (150 ml / 5 fl oz) wine
1 shot-size measure of sherry / vermouth (1.5 oz)
1 shot-size measure of distilled spirits (1.5 oz)

CAFFEINE SENSITIVITY

CYP1A2 codes for a Cytochrome P450 enzyme that is involved in Phase I (activation) of removing toxins, such as carcinogens from food and smoke, it also metabolises caffeine. Interactions have also been reported for the vitamin D receptor (VDR) which may affect the influence of caffeine on bone mineral density.

Your genetic result for CYP1A2 (A/A) mean that you have two copies of the rapid version of the enzyme and you should keep within recommended guidelines for caffeine consumption

Your VDR genotype has not been reported to influence the effect of caffeine on bone health

Gene	Result
CYP1A2*1F	AA
VDR	TC
Standard recommendation	

HOW DOES CAFFEINE AFFECT YOUR HEALTH?

Caffeine is a mild stimulant that affects the central nervous system. Many people regularly consume caffeine in drinks, food and medications such as pain relievers and flu medicines. While a moderate amount of caffeine is usually harmless, in some people excessive caffeine intake can cause anxiety, insomnia, headaches, and stomach irritation. Excessive caffeine can be bad for bone health as caffeine can prevent the absorption of vitamins and minerals in your system, including the vitamins and minerals such as calcium that build bone.

- **Take into account all of your caffeine sources including over-the-counter medications and beverages.**
- **To cut down on caffeine consumption, consider substituting herbal teas, hot cider, hot water with lemon, or decaffeinated drinks**
- **Be aware and read labels: caffeine is an ingredient in more than 1,000 over-the-counter and prescription drugs.**
- **Drip coffee has the highest concentration of caffeine (115–135 milligrams per 6 oz cup). Other common caffeine sources include espresso (100 mg per 2 oz), black teas (40-60 mg per 6 oz), certain soft drinks (35-55 mg per 12 oz), and chocolate (10-30 mg per 1.5 oz).**

Nutrient goal and limits

YOUR RDA

Nutrients	RDA†	Your goal	
Vit B1 (thiamine)	1.2 mg	1.2 mg	
Vit B3 (niacin)	18 mg	18 mg	
Vit B5 (pantothenic acid)	5 mg	5 mg	
Vit B6 (pyridoxine)	2 mg	10 mg	*
Vit B7 (biotin)	30 µg	30 µg	
Vit B9 (folc acid)	400 µg	600 µg	*
Vit B10 (PABA)	25 mg	25 mg	
Vit B12 (cobalamin)	2,4 µg	15 µg	*
Vit A	2,700 IU (810 µg)	2,700 IU (810 µg)	
Vit C	85-105 mg	105 mg	
Vit D	600 IU (15 µg)	800 IU (20 µg)	*
Vit E	15 IU (13.5 mg)	15 IU (13.5 mg)	
Vit K	140-170 µg	140-170 µg	
Inositol	30 mg	30 mg	
Choline (Vit J)	200 mg	200 mg	
Fibre	25 g	30 g	*
Omega3	1.6 g	2 g	*
Chromium	30 µg	30 µg	
Calcium	1000 mg	1,300 mg	*
Selenium	75 µg	90 µg	*
Phosphorous	700 mg	700 mg	
Iodine	150 µg	150 µg	
Iron	14 mg	14 mg	
Magnesium	240 mg	240 mg	
Potassium	3,9 g	3,9 g	
Sodium	2.4 g	2.0 g	*
Copper	0.9 mg	0.9 mg	
Zinc	11 mg	11 mg	
Physical activity		45 min / day	*
Others		**Do not exceed**	
Caffeine	300 mg	300 mg	
Saturated fats	22 g	16 g	*
Glycemic load	100	70	*

†RDA: Recommended daily allowance according to official guidelines

Section II: DIET – Weight management

Welcome to your EUROGENETICA weight loss profile. How can genetics help with weight loss and management? It is clear that genetics influences weight gain, loss and diet success – we all know examples of people who seem to be able to eat what they like without gaining weight while some of us are less fortunate. There are good evolutionary reasons why we gain weight easily and store it as fat – this was a very useful trait when food supply was scarce, erratic or both. Today where food is so abundant in much of the world this trait is less useful and we see the rise in obesity (this is called the "thrifty hypothesis"

Losing weight and keeping it of can be daunting, for a start there are so many diets – so you choose Atkins, BBB, CCC, DDD or …. Zone? Is there an exact type of diet that my genes can tell be would be best for me? This is still a question under active research, we don't have definitive answers yet – this would be the "Holy Grail" and in the same sense, we don't even know if it exists! A thorough literature research of all the various studies on weight loss, and even more importantly, weight control, has not picked a winner but one aspect has emerged very strongly: most studies confirm that the best type of diet for both losing weight and maintaining weight loss contains low saturated fat, low glycemic load (very low in refined carbohydrates) and a reasonable amount of protein and good levels of MUFA and PUFA (e.g. from olive oil and fish – see these references).

As far as genetics are concerned, yes there is some positive news. We (the group behind EUROGENETICA) have shown in a recent study that including genetics to modify the basic diet improved long term weight loss with the nutrigenetic group having greater than 5-fold improved odds at maintaining weight loss for over 1 year (ref). There is no compelling published evidence though that genetics can help to choose type of diet but we can say with some confidence that different people react in different ways to fat (especially saturated fat) and refined carbohydrate content in the diet. Using this information your genetic results are a useful tool for modifying the base diet, to reduce further saturated fats or refined carbohydrates (or both) in those who are more sensitive to these components than others. The gene-diet interactions are telling us that some people are more saturated fat sensitive than average (individuals who absorb and process fat more efficiently, good for thrift, but makes you fatter) while others are more sensitive to levels of refined carbohydrates, and of course individuals with a heightened sensitivity to both.

Weight management obviously does not just depend on DNA alone: many other factors are involved, but it has by now been clearly shown that genetics plays an important part on

why different people respond in different ways to different diets, and there are three particular aspects where we can gauge this variability and explain why “a calorie is a calorie” is not true:

- Refined carbohydrate sensitivity: the higher the sensitivity, the higher may be weight gain and glycemia for a given amount of carbohydrate
- Saturated fats sensitivity: genetic control of this aspect means that different people absorb and transport fat more or less efficiently than others
- Physical activity effects: genetics can affect the intensity of exercise required to achieve desired results aimed at burning fat but maintaining lean mass.

These factors are influenced in particular by genetic variation present in the genes *ACE, ADRB2, ADRB3, APOA2, FABP2, FTO, PPARG e TCF7L2.* The EUROGENETICA weight management test analyses your variants in these genes to determine which are present and how they may affect ideal weight loss diets. Calories are important but also the type of calories matter – your intake should be composed of the correct type and proportions of fats and carbohydrates for the most effective weight control. Your sensitivity score is used to determine by how much you should reduce your intake of saturated fats, sugars and other refined carbohydrates compared to the base diet.

Based on the results the test calculates a combined score for each of the above mentioned areas and develops the optimal macronutrient proportions for weight loss and indicates the level of exercise intensity best suited for you.

YOUR RESULTS

Patient Name	
Date of Birth	14/04/1960
Gender	M

Height	1.72 m
Weight	65 kg
BMI	22.0
Estimated Energy Requirement	2320 kcal/day

Results of genes analysed

Gene	Variant tested	Result
ACE	I/D	DD
ADRB2	Arg16Gly	Gly-Gly
ADRB3	Arg64Trp	Arg-Trp
APOA2	-265T>C	TT
CLOCK	3111T/C	CT
FABP2	Ala54Thr	Ala-Ala
FTO	A/T	AA
INSIG2	G/C	GC
LEPR	Lys656Asn	AA
LIPC	-250G>A	GG
MC4R	C/T	TT
PLIN	11482G>A	GG
PPARG	Pro12Ala	Pro-Pro
TCF7L2	C/T	TT

Refined carb sensitivity score	**6.5/10**
	Max 6% calorie tot Max GL daily = 70 Fibre = 30 g
Saturated Fats sensitivity score	**3.3/10**
	Sat Fats= max 8% calorie tot MUFA = 15% calorie tot PUFA = 12% calorie tot
Recommended exercise level	**Intensity increased**
	30-45 mins 5 days per week with at least half from high intensity activities (see table 3)

Sensitivity to
REFINED CARBOHYDRATES

Sensitivity = **6.5/10**

<u>Nutritional advice</u>:
Max 6% total calories
Max GL = 70
Fibre = 30 g

ACE	☹	Raised sensitivity. The D variation may increase sensitivity to refined carbohydrates and lead to reduced insulin sensitivity, this effect is aggravated in overweight individuals.
ADRB2	☹	Increased sensitivity
CLOCK	😐	Moderate sensitivity. Avoid snacking on high-calorie nutrient-poor foods with refined carbohydrates and sugars
FABP2	☺	Normal sensitivity
INSIG2	☺	Normal sensitivity
PLIN	☺	Normal sensitivity
PPARG	☹	Increased sensitivity
TCF7L2	☹	Increased sensitivity – your TCF7L2 genotype, TT, indicates a reduction in refined carbohydrates and an increase in fibre can be important in weight loss.

Carbohydrates are our main source of energy, but not all carbohydrates are the same. The consumption of refined carbohydrates in particular should be restrained because these are quickly absorbed into the blood stream causing peaks in glucose levels that in the long term can lead to insulin resistance, and eventually Type 2 diabetes. Refined carbs are contained in all products produced using refined flour from which important components, like fibre, have been removed. In fact the increased use of fibre in the diet is recommended because it slows down sugar absorption, making it more gradual and dampening glucose peaks. You are advised to make sure that you reach your daily recommended levels of fibre and to remain below your personal limit for refined carbs intake.

Sensitivity to
SATURATED FATS

Sensitivity = **3.3/10**

Nutritional advice:

Sat Fats = max 8%
MUFA = 15%
PUFA = 12%

ADRB2	😐	The Gly16 allele increases chances of weight gain after dieting, especially when saturated fats are high in the diet
ADRB3	😐	Increased sensitivity
APOA2	☺	Normal sensitivity
APOA5	☺	Normal sensitivity
FABP2	☺	Normal sensitivity
FTO	☹	Significantly increased sensitivity
LEPR	☺	Normal sensitivity
LIPC	☺	Normal sensitivity
MC4R	☺	Normal sensitivity
PLIN	☺	Normal sensitivity
PPARG	☹	Increased sensitivity
TCF7L2	☹	Significantly increased sensitivity

Consumption of saturated fats should be limited because as well as being very calorie dense they have also been associated with cardiovascular problems. Unsaturated fats on the other hand can have a protective effect, in fact they are called “essential” fatty acids as they are required for key cellular functions. You are advised to keep to your personal limit of saturated fat in your daily diet and to consume the advised amounts of MUFA and PUFA.

Intensity levels:
PHYSICAL ACTIVITY

Intensity = increased

30-45 mins 5 days per week with at least half from high intensity activities (see tables)

ACE	☹	Increased intensity. The negative effects of the D variant on insulin sensitivity can be ameliorated by regular exercise
ADRB2	☹	Your ADRB2 gene contains two copies of the Gly16 allele which have been shown to lead to resistance to fat-burning with exercise, with a higher intensity of exercise required for fat loss.
ADRB3	😐	The Arg64 variant is associated with a reduced sensitivity to exercise, more intense exercise is needed to have the same effect as typical intensity for carriers of the Trp64 variant. You carry one copy of each which moderately increases your exercise intensity level requirement
CLOCK	😐	Moderate sensitivity. Increase exercise intensity and watch for binge eating
FTO	☹	Significantly increased sensitivity. You are homozygous for the A allele which means you may benefit from increased levels and intensity of physical activity
GHRL	☺	Normal intensity
MC4R	☺	Normal intensity
PPARG	☹	Increased intensity – regular physical activity, of medium intensity, is especially indicated in ProPro individuals
TCF7L2	☹	Significantly increased intensity– regular physical activity is especially indicated in T allele carriers. You are homozygous TT and may benefit from increased intensity exercise

Based on your genetic results it is possible to estimate the levels of exercise that you should include daily to help to reach and maintain your ideal weight. Different people respond to exercise in different ways and while standard advice tells us to exercise about 30-45 mins for 5 days per week it does not tell us about the type of exercise, i.e. the intensity. According to recent studies some people need to do more intense activities to get equal benefit over the same period of time – this has been taken into consideration when determining your recommended personal levels.

The following tables show common types of physical activity organised according to their relative intensity – the value beside each activity is the "MET" value (Metabolic Equivalent – a measure of the intensity of the activity (and the energy consumption) compared to rest.

A comprehensive table is available from http://prevention.sph.sc.edu/tools/docs/documents_compendium.pdf.

Low intensity, long duration

- **40-60% of your maximum heart rate**
- **There is no noticeable change in breathing patterns**
- **Does not induce sweating unless it's a hot, humid day.**
- **You can easily have a sustained conversation and can even sing**

Gym		General	
Cyclette 50 watt	3	Walking slowly (< 3 kmh)	2
Running machine - slow	3	Stretching, Hatha yoga	2,5
Rowing machine, 50 watt	3,5	Playing guitar / piano	2,5
Ellipse - light	3,5	Walking downhill (4 kmh)	3
Acquafitness	4	Slow dance (waltz, mambo, tango)	3
Tai Chi, yoga etc	4	Medium bicycle (< 16 kmh)	4
Step aerobics – slow	4	Gardening	4
Stepper – slow	4	Playing the drums	4
Ellipse Cross - slow	4	Tai Chi	4
		Fast dancing (folk, country, polka)	4,5
		Golf	4,5

Medium intensity & duration

- **70% of your maximum heart rate**
- **Breathing becomes deeper and more frequent.**
- **Will break a sweat after performing the activity for about 10 minutes**
- **You can carry on a conversation but not sing**

Attività di palestra		Attività generale	
Cyclette, 100 watt	5,5	Hiking	6
Weight lifting vigorous effort	6	Walking uphill (6 kmh)	6
Cyclette, 150 watt	7	Wood & grass cutting	6
Rowing machine, 100 watt	7	Bicycling 10-11.9 mph, slow, light effort	6
Aerobics	7	Jogging	7
Running machine- jogging	7	Tennis	7
Ellipse - medium	7	Ski	7
Step aerobics – medium	7,5	swimming laps, freestyle, slow, light effort	7
Stepper – medium	7,5	Running (8 kmh)	8
Ellittica Cross - medium	7,5	Rock climbing	8

Spinning – medium	8	Fast walking (8 kmh)	8
		Basketball or volleyball matches	8
		bicycling, 12-13.9 mph, moderate effort	8
		Mountain bike	8,5

High intensity, short duration

- **80-85%% of your maximum heart rate**
- **Breathing is deep and rapid**
- **Will break a sweat after 3-5 minutes.**
- **You can only talk in short phrases.**

Gym		General	
Cyclette, 200 watt	9	Orienteering	9
Weight lifting vigorous effort	9	Running (10 kmh)	10
Cyclette, 250 watt	11	Kickboxing, judo, karate	10
Aerobica - rapid	12	Football or Rugby match	10
Rowing, 200 watt	12	Skipping	10
Running machine - running	13	swimming, crawl, fast (75 yards/minute)	10
Ellipse - rapid	13	bicycling, 14-15.9 mph, fast, vigorous effort	10
Step aerobics – fast	13,5	swimming, butterfly, general	11
Stepper – strong	14	In line skating	12
Ellipse Cross - strong	14	bicycling, 16-19 mph, racing/not drafting or >19 mph drafting, very fast, racing general	12
Spinning – strong	16	Running (13 kmh)	13,5
		bicycling, >20 mph, racing, not drafting	16

Nutritional guidelines for your Nutrigenetic results

This section will give some guidelines on how to program your nutrition based on your genetic results.

Section 1 is based on your individual sensitivity to refined carbohydrates and saturated fats. Several studies have demonstrated that genotype can affect our responses to carbohydrates, especially of the refined variety. This can affect the conversion of carbohydrates into fats and also the glycaemic responses – long term overloading the system with refined carbohydrates is suspected to be a major contribution to problems with insulin sensitivity.

- For those seeking to lose weight the proportions of refined carbohydrates and saturated fats listed in your personal report should be careful adhered, together with a restricted calorie intake, to as they are an indication of your optimal weight loss diet

- For those seeking to maintain weight the values in your personal report represent a guide for average intake as part of a normocaloric diet. For example, an individual with a high sensitivity should not eat pasta, bread, rice, potatoes, etc, every day and should restrict intake of sugars (in drinks, cakes, etc.) – allowing these maybe once a week. A person with a low sensitivity can be less strict with intake but should still follow the personal recommendations as *over-consumption* of refined carbohydrates is not advisable

- For those with no weight problem the glycaemic load guidelines represent, according to the most recent scientific evidence, optimal values to maintain a good response to dietary carbohydrates and maintain glucose-insulin homeostasis.

Section 2 indicates the foods that should be increased and decreased. Those that should be increased are the foods richest in the vitamins and minerals that according to your genotype should be increased relative to the standard “one size all” recommendations

Section 1.1 Nutrition recommendations for your refined carbohydrate sensitivity

NB for weight loss follow section (a) and for long term weight management refer to section (b)

(a) For Weight Loss You have a **HIGH** sensitivity to Refined Carbs (6.5/ 10)

Foods to mostly avoid (you can have 1 day a week "holiday")
All sugars (inc. fructose)
Biscuits
All grain (es. wheat, corn, oats, etc)
Pasta
Rice
Potatoes
Crisps
Honey
Marmalade and Jam
Yoghurts etc with added sugar
Anything made with refined flour
Dried fruits
Fruit juices with added sugar
Anything with sugar, check the ingredients

No restrictions

Fresh vegetables (prefer broccoli, cabbage, cauliflower, rocket, kale, etc…)
Herbs & Spices
Tea & coffee (2-3 per day if with caffeine)
Lean white meat (chicken, turkey, rabbit etc)
Lean red meat but not more than 1-2 per week
Limit consumption of processed meat, maximum 100g per week
Fish, especially fatty fish rich in Omega3, 2-3 times per week

Some restrictions

Fresh fruit with low glycaemic index (e.g. kiwi, berries, apples, pear)

Maximum of 2 foods from the list below, once per day:
- **100% whole grain bread, Ryvita etc**
- **Other fruit**
- **Baked goods made with 100% whole grain flour and no sugar**
- **All Bran type cereal, very rich in fibre**
- **Legumes**

Other:
- **Milk – max 100ml per day (if you have a genetic intolerance to lactose you may substitute dairy with soya or rice milk)**
- **Lean cheese, like Ricotta, cottage cheese etc. One day per week**
- **Walnuts, peanuts, etc up to 30g day**
- **Yoghurt without sugar**
- **Olive oil: 30-40 ml per day**
- **Red wine, 1 glass per day**
- **Eggs (1 per day). For those who have diabetes and/or cardiovascular disease you should limit intake to max 3 / week. Read this link: http://www.hsph.harvard.edu/nutritionsource/eggs/**

Limit consumption

Not more than once per week (on your day off):
Pasta, rice, bread and baked products made with refined flour, sugar, cakes & biscuits. Sugary drinks like Coca-Cola, Fanta, fruit juice with sugar added, Ice cream, etc

b) for weight maintenance

No restrictions

No restrictions:
- Fresh vegetables (prefer broccoli, cabbage, cauliflower, rocket, kale, etc…)
- Fresh fruit with low glycaemic index (e.g. kiwi, berries, apples, pear)
- Herbs & Spices
- Tea & coffee (2-3 per day if with caffeine)
- Lean white meat (chicken, turkey, rabbit etc)
- Lean red meat but not more than 2-3 per week
- Limit consumption of processed meat, maximum 100g per week
- Fish, especially fatty fish rich in Omega3, 2-3 times per week

Some restrictions

Maximum of 3-4 foods from the list below, once per day:
- Fresh fruit with medium glycaemic index (e.g. apricots, peaches, mandarins, melon, oranges)
- 100% whole grain bread
- Baked goods made with 100% wholegrain flour and no sugar
- Oat flakes
- Cereals with no sugar added
- Legumes

Maximum 2x per week:
Wholegrain rice or pasta (especially kamut or spelt), Couscous, quinoa, cereal minestrone (with whole grains)

Other:
- Milk – max 200ml per day (if you have a genetic intolerance to lactose you may substitute dairy with soya or rice milk)
- Cheese: hard is best, e.g. cheddar, parmesan etc up to 80g / day
- Walnuts, peanuts, almonds, hazelnuts, etc up to 40g day
- Yoghurt without sugar
- Olive oil: 30-40 ml per day
- Red wine, 1 glass per day
- Eggs (1 per day) For those who have diabetes and/or cardiovascular disease you should limit intake to max 3 / week. Read this link: http://www.hsph.harvard.edu/nutritionsource/eggs/

Limit consumption

Not more than twice per week:
Pasta, rice, bread and baked products made with refined flour, sugar, cakes & biscuits. Sugary drinks like Coca-Cola, Fanta, fruit juice with sugar added, Ice cream, etc

Sezione 1.2

Nutrition recommendations for your saturated fat sensitivity

NB for weight loss follow section (a) and for long term weight management refer to section (b)

(a) For Weight Loss

You have a **MEDIUM** sensitivity to saturated fats (3.3/10)

Foods to mostly avoid (you can have 1 day a week "holiday")
Chicken and turkey skin, pork rinds
All processed foods with saturated fats: crackers, crisps, fried foods, margarine, etc.

No restrictions

- Lean white meat (e.g. chicken without skin)
- Fish, especially fatty fish rich in Omega3, 2-3 times per week
- Egg whites

Some restrictions

- Olive oil 20-30ml
- Coconut oil (with moderation), other oils e.g. sesame, sunflower, safflower)
- Seed oil (flaxseed, pumpkin, etc
- Whole eggs. For those who have diabetes and/or cardiovascular disease you should limit intake to max 3 / week. Read this link: http://www.hsph.harvard.edu/nutritionsource/eggs/

Limit consumption

Not more than twice per week:
Red meat, cheeses, fats like lard, butter, etc. Processed meats, crisps and other high fat snacks

(b) for weight maintenance

No restrictions

- Lean white meat (e.g. chicken without skin)
- Fish, especially fatty fish rich in Omega3, 3-4 times per week
- Egg whites

Some restrictions

- Olive oil 20-30ml
- Coconut oil (with moderation), other oils e.g. sesame, sunflower, safflower)
- Seed oil (flaxseed, pumpkin, etc
- Whole eggs. For those who have diabetes and/or cardiovascular disease you should limit intake to max 3 / week. Read this link: http://www.hsph.harvard.edu/nutritionsource/eggs/

Limit consumption

Not more than 3x per week:
Red meat, cheeses, fats like lard, butter, etc. Processed meats, crisps and other high fat snacks

Notes on Glycaemic index

A low glycaemic index and glycaemic load is advisable for many reasons including prevention of type 2 diabetes and some other conditions of ageing. The glycaemic load is calculated from the foods eating during the whole day. The following table classifies Load and Index as High, Medium and Low

Value	glycemic index	glycemic load
High	70+	20
Medium	56 - 69	11 - 19
Low	55 or less	10 or less

WHAT IS GLYCEMIC LOAD AND GLYCEMIC INDEX?

Carbohydrates serve as one of the body's main sources of energy. How your body responds to the various carbohydrates in foods depends on the Glycemic Index (GI) of the food. Glycemic Index is a rating scale that defines carbohydrate-rich foods on a scale from 0 to 100. Foods are ranked according to how much they raise blood-glucose levels after eating. High GI foods are rapidly digested and absorbed, which may result in large swings in blood glucose levels. Low GI foods are digested and absorbed more slowly, and may result in more stable levels of blood glucose. Glycemic Load (GL) is a reference that takes into account the Glycemic Index of a food and the amount of the food that you need to eat to measure the full impact on your blood glucose levels. The higher the Glycemic Load, the greater the increase in blood glucose. To maintain long term health, consider consuming foods with a lower GL to help keep blood glucose levels steady in order to promote optimal health and well-being.

- **Consume whole grains. The fibrous coat of the hull or skin from grains slows down the digestion and absorption of carbohydrates. An example of a whole grain product is whole-wheat flour, bulgur and brown rice.**
- **Choose long-grain, brown rice as a staple because this variety of rice has the lowest GI compared to other rice.**
- **Pasta has a low GI, but a large portion can result in a high GL.**

Section 2 – Foods for Optimum Nutrition

Your genetic test results have indicated various foods that should be increased (at least 1 portion per week) or decreased in your diet (compared to standard recommendations). The table below shows the various foods according to category – follow the indications in the table and optimise your nutrition thanks to a balanced diet personalised according to your personal genetics

	Liver Kidney	Poultry skin (chicken, duck, turkey, etc) Meat stock Grilled meat Pan fried meat Smoked meat Processed meats (mortadella, sausage, wurstel, bacon, ham, prosciutto, salami) Animal fat
	Clams Shrimp, lobster Fish liver oil Tuna (fresh) Fatty fish (Herring, Mackerel, Salmon, Sardines)	Grilled fish Pan fried fish Smoked fish Salted fish (herring, anchovy, salted cod, etc)
	Cruciferous (Brussels sprouts, Mustard greens, savoy cabbage, Kale, Watercress, Kohlrabi, Red Cabbage, Broccoli, Horseradish, Cauliflower) Lentils Beans (cannellini, borlotti, ecc) Leafy greens	High glycemic index vegetables (potato, corn, beetroot, etc) White bread Refined flour products White rice and pasta Cornbread Vegetable stock Sun dried tomatoes Soy sauce Snacks (eg peanuts, crisps, etc)
	Flaxseed Brasil nuts Nuts/Seeds	High glycemic index fruit (dried fruit, apricots, banana, dates, cherries, pineapple, etc) Palm oil, Coconut oil Coconut dried
	Lactose free milk (including calcium fortified soya, rice, etc) Yoghurt (lactose free) Hard cheese (Cheddar, Parmesan, ecc) Mozzarella (lactose free)	Milk Soft cheese Yogurt Butter Chocolate Full fat cheese Cream