Biron B

Genetics

NUTRITION PROFILE

DEMO

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Align your nutrition with your genes

Biron B Genetics

The food you eat is the foundation of healthy habits and reflects directly on health, both in the short and long term. However, you are unique and you do not necessarily react the same way as another person to the various element of your diet. Differences like these can be explained simply by the variations in your DNA that affect your reaction to various nutrients. By knowing which genetic variations you carry, you can now make more informed decisions when choosing what to put on your plate.

THE GOAL OF THE NUTRITION PROFILE

The Nutrition Profile allows you to adjust your diet and improve your health by using your genetic signature. With the results of the Nutrition Profile, your dietician or physician can better target your food priorities and establish an action plan that meets your unique needs.

WHAT IS TESTED

The Nutrition Profile identifies genetic variations in 13 genes allowing you to know how your body reacts to 10 specific nutrients. We use a method called genotyping and target only the DNA regions relevant to the test. With respect to your entire human genome, we analyze less than 1% of all your genetic information.

THE PROCESS

From your saliva sample, your DNA is extracted and analyzed. Once your genetic variations have been identified, your personalized report is created. This report contains recommendations based on evidence- based scientific research and expert opinions. With your permission, your Nutrition Profile report is also given to your healthcare professional, who will explain the significance and scope of each result, and evaluate your priorities relative to your current eating habits. With your consent, the remaining DNA material will be kept for future analyses.

THE TECHNOLOGICAL LIMITS

Our analyses are 99% accurate. However, there remains a possibility that an error may occur. In the case where your sample cannot be analyzed, you will be re-contacted for another sample collection. It is also possible that we are unable to analyze one of your genes. This is a limit of our technology and it is in no way indicative of a problem from your part. This may happen due to the genetic diversity of our clients.

INTERPRETATION OF THE NUTRITION PROFILE

Our Nutrition Profile test uniquely analyzes the variations that may be present in your DNA. This test does not detect your actual nutritional intake. The Nutrition Profile represents what is the first half of your action plan. The other half lies on the evaluation of your current nutrition. From there, it is important that your Nutrition Profile results are discussed with a dietician or physician who will be capable of creating an action plan based on your genetic results. It is also important to understand that the disease risks mentioned in the Nutrition Profile report are statistical probabilities and not absolute certainties.

SUMMARY OF YOUR RESULTS

DEMO

Sex : Male
Date of birth : 2008-09-14
Date of report : 2023-04-05
Sample No. : BIO

NUTRIENT	NOTIFICATION	RECOMMENDATION
METABOLIC HEALTH		
VITAMIN C p.6	Increased risk of vitamin C insufficiency	Consume at least 90mg/day of vitamin C.
FOLATE p.7	No identified risk	Consume 400 mcg of DFE/ day.
GLYCEMIC LOAD p.8	Sensitive to foods with a high glycemic load	Always prioritize foods with a low glycemic load, that is <10.
CARDIOVASCULAR HEALTH		
OMEGA-3 p.10	Increased risk of high blood triglyceride levels	Consume approximately 1240 mg/day of EPA and DHA omega-3 fatty acids.
SODIUM p.11	Increased risk of being sensitive to sodium	Consume a maximum of 1500 mg/day of sodium.
CAFFEINE p.12	Intermediate metabolizer of caffeine	Consume a maximum of 200 mg/day of caffeine.
BONE HEALTH		
VITAMIN D p.14	Increased risk of insufficient vitamin D	Consume at least 600 IU/day of vitamin D.
WEIGHT MANAGEMENT		
SATURATED FAT p.16	Increased risk of weight gain	Consume less than 22 g/day of saturated fat.
INTOLERANCE & SENSITIVITIES		
LACTOSE p.18	No risk associated to your genetic variations for this gene	You should be able to consume foods that contain lactose.
GLUTEN p.19	DQ2/DQ8-positive; cannot exclude the possibility of celiac disease	In case of recurrent gastrointestinal symptoms upon consumption of gluten-containing foods, it is recommended to seek the advice of a physician or registered dietitian.

METABOLIC HEALTH

Vitamin C, folate and carbohydrates are essential nutrients that affect the entire body. The appropriate daily intake of each of these nutrients is necessary to maintain your health. What is the appropriate intake?

Based on your DNA, your body may be more sensitive to the quality of carbohydrates you consume or to suboptimal intake of vitamin C or folate. Unchecked, diseases may develop unknowingly for years and appear only once it is too late.

Even though many diseases are complex and multifactorial, eating well remains one of the most important factors in their prevention. What would you say to reduce your risk one bite at a time?

VITAMIN C

Help your body fight oxidative stress

YOUR RESULTS

NOTIFICATION

Increased risk of vitamin C insufficiency

GENES	YOUR GENETIC VARIATIONS
GSTM1	*0/*0
GSTT1	*0/*0

RECOMMENDATION

Consume at least 90mg/day of vitamin C.

SUMMARY

According to your genetic variations present in the genes GSTT1 and GSTM1, your level of vitamin C may be suboptimal if you consume less than 90mg/day. If you smoke, it is suggested to increase your vitamin C intake to 125mg/day. Through a diet rich in vegetables and fruits your vitamin C needs will be met.

DIETARY SOURCES OF VITAMIN C

ALIMENTS	QUANTITY OF VITAMIN C
1/2 cup (125 mL) of red or yellow pepper	120 mg
1 kiwi	84 mg
1 orange	75 mg
1/2 cup (125 mL) of cooked broccoli	54 mg
1/2 cup (125 mL) of strawberries	52 mg
4 Brussels sprouts	45 mg
1/2 cup (125 mL) of snow peas	40 mg
1/2 grapefruit	40 mg
1 clementine	36 mg

ABOUT VITAMIN C

Along with its role in collagen production, this water-soluble vitamin also happens to be an excellent antioxidant. Also known as ascorbic acid, vitamin C is able to neutralize free radicals that attack the cells in our body on a daily basis. The antioxidant power of vitamin C helps protect individuals against atherosclerosis, type 2 diabetes and certain types of cancers. The EPIC-Norfolk cohort study showed that an adequate intake of vitamin C helps reduce 20% of all-cause mortality.

GENETICS AND VITAMIN C

Many genes have been identified as having an effect on the transportation, absorption and regulation of vitamin C. Among these, the GSTT1 and the GSTM1 genes code for enzymes involved in the recycling of vitamin C in the body. Some studies support a correlation between the variant *0/*0 on the GSTT1 and GSTM1 genes and a suboptimal vitamin C blood concentration, in comparison to individuals who carry at least *1.

FOLATE

Not only for mommy!

YOUR RESULTS

NOTIFICATION

No identified risk

RECOMMENDATION

Consume 400 mcg of DFE/day.

SUMMARY

According to your genetic variations present in the gene MTHFR, your levels of serum folate and homocysteine should remain adequat even during periods where your intake of dietary folate equivalents (DFE) is less than optimal. Folate is mainly found in legumes, dark green vegetables, and in enriched wheat flour products.

GENES	YOUR GENETIC VARIATIONS
MTHFR	CC

DIETARY SOURCES OF FOLATE

FOOD ITEM	AMOUNT OF FOLATE
3/4 cup (175 mL) of lentils	265 mcg of DFE
1 cup (250 mL) of cooked spaghetti	184 mcg of DFE
6 cooked asparagus	128 mcg of DFE
2 cups (500 mL) of raw spinach	122 mcg of DFE
3/4 cup (175 mL) of chickpeas	119 mcg of DFE
3/4 cup (175 mL) of black beans	108 mcg of DFE
3/4 cup (175 mL) of red beans	97 mcg of DFE
1/2 cup (125 mL) of All Bran cereals	50 mcg of DFE
1 slice of whole bread	14 mcg of DFE

ABOUT FOLATE

Folate, also known under the name of vitamin B9 or folic acid, is mostly recognized for its role in the neural foetal development. Additionally, it is involved in the conversion of homocysteine into methionine, thereby maintaining levels of homocysteine in the blood within normal range. This is pivotal, since high levels of homocysteine are associated with varied pathologies such as cancers and Alzheimer's disease. Moreover, studies have shown a connection between low levels of folate, high levels of homocysteine, and risks for atherosclerotic vascular diseases and stroke. Folate metabolism varies from one person to another, a phenomenon that can be partly explained by genetics and the MTHFR gene.

GENETICS AND FOLATE

The MTHFR gene is responsible of producing the methylene tetrahydrofolate reductase enzyme (MTHFR). It activates folate in the body. The MTHFR enzyme operates at full capacity in carriers of the CC variant on the MTHFR gene. On the other hand, the enzyme is less efficient in carriers of the CT or TT variants. Consequently, individuals who have these variants are at increased risk of developing sub-optimal levels of blood folate and elevated homocysteine levels when combined with a low intake of this vitamin.

GLYCEMIC LOAD

Does your food measure up?

YOUR RESULTS

NOTIFICATION

Sensitive to foods with a high glycemic load

GENES	YOUR GENETIC VARIATIONS
TCF7L2	GT

RECOMMENDATION

Always prioritize foods with a low glycemic load, that is <10.

SUMMARY

According to your genetic variations present in the gene TCF7L2, frequently consuming foods with a high glycemic load will increase your risk of developing type 2 diabetes and higher than normal blood glucose levels. Always prioritize foods with a low glycemic load, such as vegetables, whole fruits rather than their juices, and products with whole wheat flour. Moreover, Moreover, a blood dosage for glycated haemoglobin may be indicated. Talk about it with your doctor.

ABOUT GLYCEMIC LOAD

Glycemic load measures the quality and the quantity of carbohydrates in foods. It is calculated based on the standard portion and the glycemic index of a food. The higher the value is, the higher the blood glucose increases following the consumption of the food. Remember that abnormally high blood glucose levels may, over time, cause heart and renal complications as well as blood vessel and nerve damages. Foods can be classified according to the value of their glycemic charge: null (0), low (1 to 10), moderate (11 to 19) or high (≥ 20). Recent studies support that there is an interaction between the TCF7L2 gene, regular consumption of high glycemic load foods and the risk of developing of type 2 diabetes.

GLYCEMIC LOADS COMPARISON

FOOD ITEM	GLYCEMIC LOAD	FOOD ITEM	GLYCEMIC LOAD
1 white bagel (70 g)	25	1 slice (35 g) of whole wheat bread	10
1/2 cup (85 g) de white rice	24	1/2 cup (85 g) of brown rice	18
1 boiled potato (150 g)	23	3/4 cup (150 g) of quinoa	13
30 g of Cornflakes	22	30 g of Bran buds	7
1 cup (150 g) de white spaghetti	22	1 cup (150 g) of whole wheat spaghetti	16
1 Carrot muffin	20	50 g of mixed nuts	3
Snack: chocolate bar	18	Snack: 8 baby carrots with 2Tbsp (30 g) of hummus	2
1 cup (250 mL) of orange juice	12	1 orange	5

GENETICS AND GLYCEMIC LOADS

The TCF7L2 gene codes for a transcription factor that has many functions in the body. One of them is to influence the body's response after eating carbohydrates. Scientific studies have established a connection between the rs12255372 marker and the TCF7L2 gene. A T allele in this position increases risks of developing type 2 diabetes if the intake of high glycemic load foods is frequent. Individuals who carry GG diplotype are not at increased risk of developing this condition.

CARDIOVASCULAR HEALTH

The heart is a complex muscle whose lifelong rhythmic contractions distribute oxygen and nutrients to the body. However, with time, the cardiovascular system can become fragile and rigid, which can lead to cardiovascular disease. In Canada, heart disease represents the second most common cause of death (Statistics Canada, 2011).

The good news is that 80% of heart attacks and cerebral vascular accidents can be prevented by acting on three aspects that you control: your physical activity, smoking, and your nutrition. In the following pages, discover how you can have a positive impact on your cardiovascular health by adjusting your nutrition.

OMEGA-3

Choose good fats for a healthy heart

YOUR RESULTS

NOTIFICATION

Increased risk of high blood triglyceride levels

GENES	YOUR GENETIC VARIATIONS
NOS3	GT

RECOMMENDATION

Consume approximately 1240 mg/day of EPA and DHA omega-3 fatty acids.

SUMMARY

According to your genetic variations present in the gene NOS3, you are more susceptible to have high blood triglyceride levels if you do not consume enough omega-3. To decrease this risk, consume approximately 1240mg of EPA and DHA omega-3's per day. Because the body can only convert ALA into EPA and DHA at the rate of 10% for men and 30% for women, you should aim for about three portions of fatty fish per week as well as a few plant-based sources. Moreover, an evaluation of your blood lipids via a lipid profile may be indicated. Talk about it with your doctor.

ABOUT OMEGA-3 FATTY ACIDS

Omega-3 are polyunsaturated fatty acids that have numerous beneficial effects on health. There are 3 types of omega-3 fatty acids: ALA (alpha-linoleic acids), EPA (eicosapentanoic acids) and DHA (docosahexanoic acids). With their anticoagulant and anti-inflammatory properties, EPA and DHA fatty acids, more specifically, exert a positive impact on the immune and cardiovascular systems. Recent studies support a connection between a variant on the NOS3 gene, the amount of omega-3 consumed and levels of blood triglycerides. Note that higher than normal triglyceride levels may contribute to the development of metabolic syndrome, and so increasing risks of cardiovascular diseases.

DIETARY SOURCES OF OMEGA-3

ANIMAL SOURCES	AMOUNT OF EPA & DHA
75 g of salmon	1600 mg
75 g of hareng	1500 mg
75 g of sardines	900 mg
75 g of trout	700 mg
75 g of canned white tuna	202 mg

PLANT-BASED SOURCES	AMOUNT OF ALA (converted value)
1 Tbsp (15 mL) of ground flaxseeds	2460 mg (738 mg)
1/4 cup (60 mL) of walnuts	2300 mg (690 mg)
1 Tbsp (15 mL) of chia seeds	1900 mg (570 mg)
1 Tbsp (15 mL) of canola oil	1260 mg (378 mg)

GENETICS AND OMEGA-3 FATTY ACIDS

The NOS3 gene produces nitric oxide synthase 3, an enzyme involved in many mechanisms in the body. A variation at the rs1799983 marker on this gene is associated with high blood triglyceride levels and risk of cardiovascular disease in the context of low omega-3 intake. According to recent studies, individuals with the GT or TT diplotype are more sensitive to variations in omega-3 intake, as reflected in their blood triglyceride levels. For these individuals, a diet poor in omega-3 is associated with increased triglyceride levels while a diet rich in omega-3 significantly reduces those levels.

SODIUM

The salt shaker isn't the only culprit

YOUR RESULTS

NOTIFICATION

Increased risk of being sensitive to sodium

RECOMMENDATION

Consume a maximum of 1500 mg/day of sodium.

GENES	YOUR GENETIC VARIATIONS
ACE	In/In

SUMMARY

According to your genetic variations present in the gene ACE, consuming a high amount of sodium increases your risk of salt-sensitive hypertension. You can significantly reduce this risk by consuming less than 1500 mg/day of sodium. Sodium is naturally found in many foods and is often added to manufactured products such as processed meats, prepared meals, sauces, chips, and cheeses.

ABOUT SODIUM

Sodium, also commonly associated with table salt, is a mineral with many roles in the body. Sodium is involved in muscle contraction, hydration status and acid-base homeostasis of the organism, among other functions. While it is essential for the body, sodium becomes harmful for health when consumed in excess. As a key player in the development of hypertension, sodium excess contributes directly and indirectly to the onset of cardiovascular and renal diseases. Health Canada reveals that Canadians consume on average twice the amount of sodium than the body needs.

DIETARY SOURCES OF SODIUM

FOOD ITEM	AMOUNT OF SODIUM
1 small container (30 mL) of soy sauce	2482 mg
1 cup of canned soup (250 ml)	913 mg
1 small container (30 mL) of sodium reduced soy sauce	850 mg
2 slices of bacon (47 g)	727 mg
1/2 cup (125 mL) of canned tomatoes	614 mg
75 g of salami or Bologna sausage	589 mg
1/2 cup (125 mL) of cottage cheese	437 mg
1 slice of ham (21 g)	279 mg
1 slice of bread (35 g)	214 mg
30 g of cheddar, mozarella or Gouda cheese	207 mg

GENETICS AND SODIUM

The ACE gene codes for the angiotensin conversion enzyme (ACE) which is a peptide playing an important role in blood pressure regulation. Studies reveal that an insertion (In) or a deletion (Del) of a complete segment on the ACE gene would alter the function of the coded enzyme and thereby influences blood pressure regulation in relation to sodium intake. This segment can be detected by the A allele for the insertion and the G allele for the deletion at the rs4343 marker. Compared to individuals with the Del/Del diplotype, those with the In/Del or In/In diplotype are more sensitive to sodium and are therefore more at risk of developing hypertension with a high sodium diet.

CAFFEINE

Give a little rest to your heart

YOUR RESULTS

NOTIFICATION

Intermediate metabolizer of caffeine

GENES	YOUR GENETIC VARIATIONS
CYP1A2	AC

RECOMMENDATION

Consume a maximum of 200 mg/day of caffeine.

SUMMARY

According to your genetic variations present in the gene CYP1A2, a caffeine consumption of more than 200 mg/ day increases your risks of heart diseases (hypertension and myocardial infraction). Stay within this limit to significantly reduce your risks.

DIETARY SOURCES OF CAFFEINE

NUTRIMENTS	CAFFEINE QUANTITIES
1 cup (250 mL) coffee	100 mg
1 cup (250 mL) energy drink	100 mg
1 cup espresso, simple (30 mL)	75 mg
1 cup (250 mL) black tea	43 mg
1 can (355 mL) of soda	40 mg
1 cup (250 mL) green, Oolong, white tea	30 mg
25 g of black chocolat	27 mg
25 g of milk chocolat	7 mg
1 cup (250 mL) of decaffeinated coffee or tea	0-5 mg

ABOUT CAFFEINE

Caffeine is found in highly popular beverages such as coffee, tea and even some soft drinks. Cocoa is also a source of caffeine found in food. Caffeine, known as a stimulating agent, affects everyone in different ways. Some studies link coffee to increased risks of high blood pressure and cardiovascular disease, while other studies show a protective effect on health. Recent genetic discoveries have helped clarify these conflicting findings. Variations on the CYP1A2 gene hold the answer.

GENETICS AND CAFFEINE

The CYP1A2 gene produces an enzyme called cytochrome P450-1A2. One of its functions is to metabolize caffeine. Located in the liver, it degrades caffeine and thereby neutralizes its effect. The presence of the C allele on the CYP1A2 gene slows down the caffeine degradation rate. Therefore, individuals who carry the AC or CC diplotype are more prone to develop hypertension or suffer from myocardia infarction if they consume high amounts of caffeine on a regular basis. Conversely, individuals with the AA diplotype deactivate caffeine faster, resulting in lower risks of developing cardiovascular diseases. Caffeine intake in moderation may even have a protective effect on individuals with the AA diplotype, as shown in some studies.

BONE HEALTH

Your bones offer your body an ideal support; they give you're body the liberty of movement and flexibility all while protecting your organs against impacts. Despite the constant regeneration of bone tissue, after the age of 30 to 35 years, bone density naturally decreases from 0.5 to 1% annually. This decrease could lead to osteoporosis, a condition characterized by bones that are thinner, weaker and more porous, rendering them more susceptible to fractures.

To maintain your bone health, it is essential to bring attention to the various factors such as physical activity, smoking, and of course, nutrition.

VITAMIN D

Add a bit of sunshine to your plate

YOUR RESULTS

NOTIFICATION

Increased risk of insufficient vitamin D

GENES	YOUR GENETIC VARIATIONS
CYP2R1	AG
DHCR7	GT
GC	GT

RECOMMENDATION

Consume at least 600 IU/day of vitamin D.

SUMMARY

According to your genetic variations present in the genes GC, CYP2R1 and DHCR7, you are more susceptible to a suboptimal level of vitamin D if you consume less than 600 international units (IU) of vitamin D per day. Have a diet filled with fatty fish as well as milk or vitamin D- enriched soy beverages to meet your needs. Moreover, a blood dosage for vitamin D, calcium and phosphorus may be indicated. Talk about it with your doctor.

DIETARY SOURCES OF VITAMIN D

FOOD ITEM	AMOUNT OF VITAMIN D
75 g of sockeye salmon	615 IU
75 g of Atlantic salmon	214 IU
75 g of trout	180 IU
1 cup (250 mL) of enriched, unsweetened soy milk	106 IU
1 cup (250 mL) of milk (skim, 1%, 2%, 3.25% M.F.)	104 IU
75 g of canned tuna	60 IU
1 egg	35 IU
½ cup of cooked Shiitake mushroom	20 IU

ABOUT VITAMIN D

Vitamin D holds many essential roles in the body. It helps maintain our immune function, neuromuscular function, and especially the growth and health of the bones. When lacking vitamin D to regulate calcium and phosphorus metabolism, bones become weaker and thinner therefore increasing risks of osteopenia, osteoporosis and fractures. Vitamin D can be obtained from sunlight, which triggers vitamin D synthesis in the skin. Vitamin D can also be obtained from food sources. Vitamin D synthesis declines over the winter months, when sunlight exposure is reduced. It is therefore necessary to ensure adequate vitamin D intake during that time of year.

GENETICS AND VITAMIN D

Several genes are involved in the regulation of vitamin D levels in the body. The gene GC codes for the vitamin D binding protein, essential for transport of the vitamin. The gene CYP2R1 codes for a liver enzyme involved in the activation of vitamin D. Lastly, the gene DHCR7 codes an enzyme indirectly involved in the regulation of vitamin D synthesis. Studies indicate an increased risk for vitamin D insufficiency in individuals carrying variations in markers rs2282679, rs10741657 and rs12785878, found in the genes GC, CYP2R1 et DHCR7 respectively.

WEIGHT MANAGEMENT

Obesity is a worldwide phenomenon of which the rate has more than doubled in the last 35 years. Today, in the first world countries, 13% of the adult population are considered obese and 39% suffer from being overweight. Obesity contributes to serious chronic health problems, such as type 2 diabetes, hypertension, cardiovascular diseases, arthritis, as well as certain cancers.

Even though the equation is simple, energy consumed versus energy spent, there are a number of socioeconomic, physiologic, psychological, environmental, and genetic factors that also play a role in the development of obesity. The nutrition profile offers you a glimpse of your DNA and proposes adjustments to your nutrition to better manage your weight.

SATURATED FAT

Charcuteries or healthy waist line?

YOUR RESULTS

NOTIFICATION

Increased risk of weight gain

GENES	YOUR GENETIC VARIATIONS
APOA2	CC

RECOMMENDATION

Consume less than 22 g/day of saturated fat.

SUMMARY

According to your genetic variations present in the gene APOA2, you are at a higher risk of weight gain and obesity if you consume more than 22 g/day of saturated fat. To stay within this threshold, limit your consumption of red meats, high- fat dairy products, and pastries. Moreover, as recommended by the Canadian Cardiovascular Society Guidelines, a dyslipidemia screening should be done for individuals over 40 years old and the ones with certain risk factors, such as obesity. A blood lipid profile may be indicated. Talk about it with your doctor.

DIETARY SOURCES OF SATURATED FATS

FOOD ITEM	AMOUNT OF SATURATED FATS
1 Tbsp (15 mL) of butter	8 g
75 g of minced beef, regular	7 g
1 butter croissant (57 g)	7 g
30 g of cheddar cheese	6 g
20 French fries	5 g
1/2 cup (125 mL) of ice cream	5 g
75 g of minced beef, extra lean	3 g
1 Tbsp (15 mL) of cream (18% M.F.)	2 g

ABOUT SATURATED FATS

Saturated fats are associated with high LDL cholesterol levels and cardiovascular problems. These saturated fats can stiffen arterial cell walls and are therefore more damaging to health than monounsaturated and polyunsaturated fats. New research has shown a connection between a high consumption of saturated fat, the APOA2 gene, and weight gain.

GENETICS AND SATURATED FATS

Weight gain and obesity are multifactorial phenomena that imply, amongst other things, genetics. The APOA2 gene codes for the production of apolipoprotein A2, which is a molecule involved in fat metabolism in the body. A simple variation at the rs5082 marker on the APOA2 gene, combined with a high saturated fat diet, increases significantly the risk of weight gain and obesity, as studies reveal.

INTOLERANCE & SENSITIVITIES

Intolerances or sensitivities arises when the body is not capable of appropriately digesting a nutrient or when a nutrient triggers an abnormal immune reaction. These undesirable reactions can manifest in several ways such as stomach pains, bloating, skin rashes, or even joint pain. The effects of intolerances and sensitivities can come within minutes to days after consumption of the trigger foods.

LACTOSE

Does dairy do you good?

YOUR RESULTS

NOTIFICATION

No risk associated to your genetic variations for this gene

GENES	YOUR GENETIC VARIATIONS
LCT	TT

RECOMMENDATION

You should be able to consume foods that contain lactose.

SUMMARY

According to your genetic variations analyzed in the gene LCT, your risk of developing an intolerance to lactose is low. Your body should be capable of digesting lactose. Nevertheless, chances of developing an intolerance associated to other factors independent of this variation remain unchanged.

DIETARY SOURCES OF LACTOSE

FOOD ITEM	AMOUNT OF LACTOSE
1 cup (250 mL) of milk (skim, 1%, 2%, 3.25% M.F.)	13 g
3/4 cup (175 mL) of yogurt	8 g
3/4 cup (175 mL) of coffee latte, prepared with whole milk	7 g
1/2 cup (125 mL) of ice cream	5 g
1/2 cup (125 mL) of pudding	3 g
1/2 cup (125 mL) of cottage cheese	3 g
30 g of hard cheese (Suisse, Parmesan, cheddar)	< 1 g

ABOUT LACTOSE

Lactose is a complex sugar found in milk products. These products are excellent sources of nutrients, such as high quality proteins and numerous vitamins and minerals that all contribute to the maintenance of health. For some individuals, the ability to digest lactose decreases or even disappears with age. For individuals who are intolerant to lactose, the consumption of dairy products can lead to symptoms such as bloating, flatulence and cramping.

GENETICS AND LACTOSE

The LCT gene codes for the lactase enzyme that is responsible for the digestion of lactose. When the production of this enzyme decreases, the ability to digest lactose is partially or completely lost, resulting in digestive symptoms linked to lactose intolerance. Studies show that a variation at the rs4988235 marker on the LCT gene is involved in the development of lactose intolerance. Individuals with the CC variant are at increased risk of developing lactose intolerance, compared to individuals with the TT or TC diplotypes.

GLUTEN

What is your risk for celiac disease?

YOUR RESULTS

NOTIFICATION

DQ2/DQ8-positive; cannot exclude the possibility of celiac disease

GENES	YOUR GENETIC VARIATIONS
HLA-DQ	DQ2.2/DQX

RECOMMENDATION

In case of recurrent gastrointestinal symptoms upon consumption of gluten- containing foods, it is recommended to seek the advice of a physician or registered dietitian.

SUMMARY

Based on the disease frequency in the general population, your risks of developing celiac disease are of 2.5-3.3%. Your risks increase if a family member has been diagnosed with celiac disease. However, while the DQ2/DQ8 markers are generally regarded as necessary for celiac disease, they are not sufficient for disease development. Other factors should be considered to thoroughly evaluate your risk level. In case of family history of celiac disease or in presence of symptoms, an anti-transglutaminase antibody test may be indicated. Talk about it with your doctor.

DIETARY SOURCES OF GLUTEN

SOURCES OF GLUTEN	Foods sometimes contaminated with gluten
Wheat, wheat flour and its derivatives (ex.: bread, pasta, couscous)	Oats
Rye, rye flour and its derivatives	Processed meals
Spelt, spelt flour and its derivatives	Potato chips
Barley	Chocolat
Beer	Ketchup
Breakfast cereals	Instant rice
Vinegar	Dairy products low in fat
Soya sauce	Certain seasonings

ABOUT GLUTEN

Gluten is a complex of proteins mainly found in wheat, rye and barley. It is therefore found in many baked products as well as refined foods. Approximately 1% of the population suffers from celiac disease, while another 5 to 10% seems to experience non- celiac gluten sensitivity (NCGS). For individuals with celiac disease, the consumption of gluten triggers an autoimmune response that damages the small intestine walls and interferes with nutrient absorption. On the other hand, people with NCGS do not experience this phenomenon. To this day, the only detection method for a NCGS is to adopt a gluten free diet and evaluate if symptoms resolve.

GENETICS AND GLUTEN

Six genetic variations located in the "human leukocyte antigen system" (HLA) are involved in the immune response triggered by the consumption of gluten. In 99% of cases, individuals diagnosed with celiac disease carry the genetic variants HLA-DQ2 and/or HLA-DQ8 (DQ2/DQ8-positive). However, carrying those versions of the HLA gene is not sufficient to develop coeliac disease. The majority of people positive for DQ2/DQ8 (30-40% of the population) will never develop the disease or any gluten sensitivity, even with a gluten-rich diet.

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Folate

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