

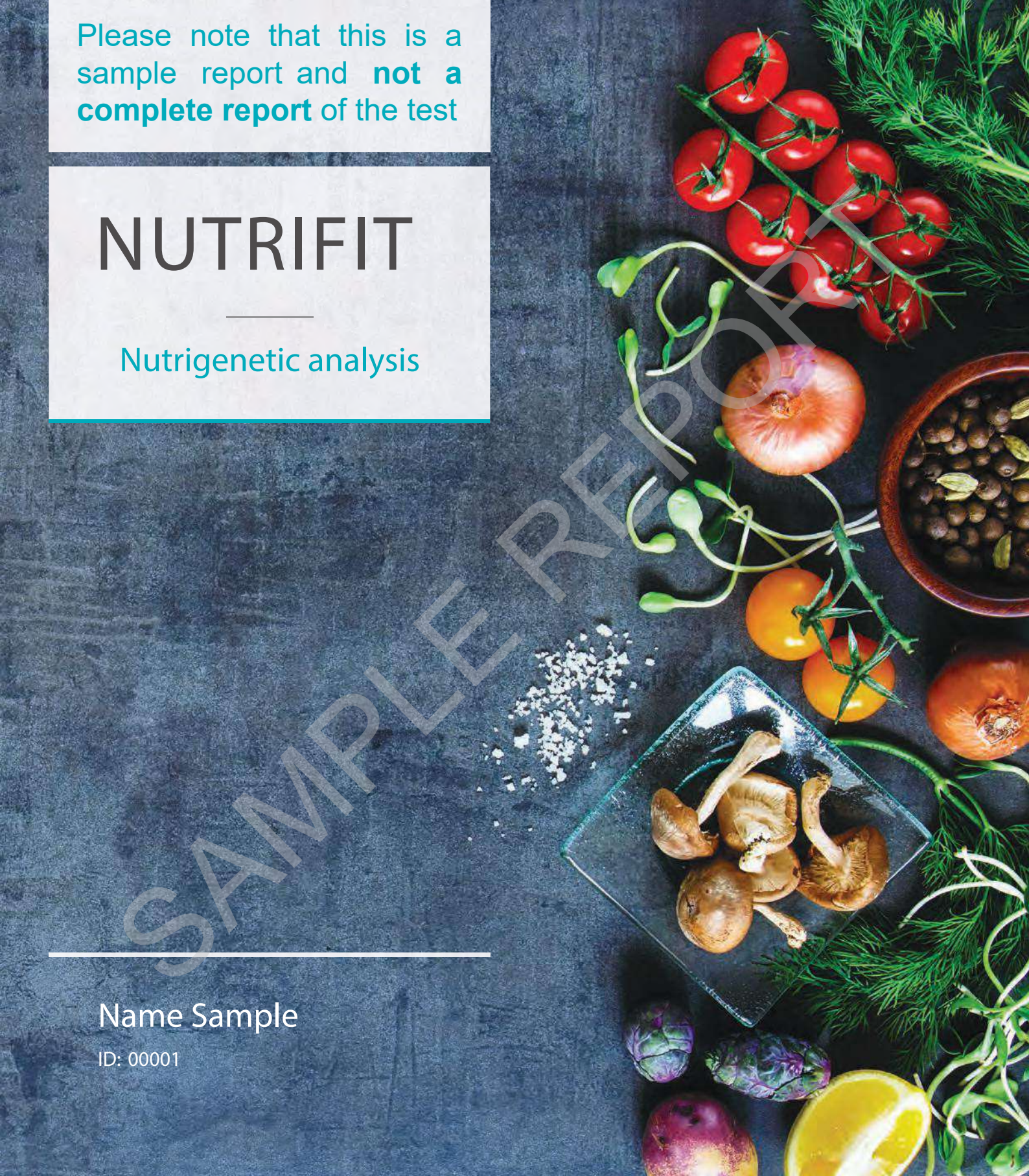
Please note that this is a  
sample report and **not a**  
**complete report** of the test

# NUTRIFIT

Nutrigenetic analysis

Name Sample

ID: 00001





### Dear Mr Sample,

we congratulate you on an important step that you have made towards self-discovery. The better you know yourself, the easier you influence your body weight, youthful look, your fitness and health. As the genes are the ones that determine the response of your metabolism and muscles, your personal DNA analysis will allow you to optimise eating habits and exercise routine in order to reach your goals much more easily. We believe that with carefully prepared, personalised recommendations, our experts will justify the trust that you have invested in us.

We are happy to be able to follow you on this exciting journey where you will, with the help of your personal DNA analysis, finally discover how your body functions. The secret to success that your personal DNA analysis will lead you to is hidden in the personalised diet and lifestyle plan, in which all the needs that your genes determine are taken into consideration.

The analysis of your genes is performed according to the highest quality standards. In the first stage, on the basis of relevant scientific literature, we submit the genes to rigorous selection where, among many, we chose only those for which the influence has been proven, and for which there is enough reliable evidence and quality scientific research. We perform the analysis in a laboratory, which operates according to the ISO's quality standards, where we analyse your DNA using an extremely reliable and most advanced technology. In addition, nutritional experts create expert nutritional and lifestyle recommendations especially for your genetic makeup.

It is precisely our high quality standards that guarantee reliable results of DNA analysis. Or, as the head of the Chair of Pharmaceutical Biology, prof. Borut Štrukelj, M. Pharm., Ph.D., says:

*"The personal DNA analysis reveals surprising information which has not been known to us so far. It enables the individual to start eating according to his/her genetic makeup. He/she therefore ingests only what his/her body needs, and, inversely, avoids the nutrients which are, according to his/her genetic makeup, harmful."*

prof. Borut Štrukelj, M. Pharm., Ph.D., The Faculty of Pharmacy, University of Ljubljana

We are convinced that your personal DNA analysis will lead you to appropriate eating habits, a healthier lifestyle, a better well-being and, consequently, a better personal appearance. We would like you to know that your personal DNA analysis does not contain any pathological diagnoses, and we recommend that you consult your personal doctor, in case of any bigger changes to your eating habits.

You yourself are the key to final success of your DNA analysis, and we, therefore, advise you to follow the recommendations, and practise them responsibly. You are about to discover surprising information about yourself that will help you make the best of the potential that Mother Nature has given you.



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THE INFLUENCE OF DIET ON BODY WEIGHT

Analysis	Your result	Summary
Response to saturated fats	<div></div> NORMAL	The intake of saturated fats is not additionally unfavourable for you. Despite that, your daily intake should not exceed 10% of caloric intake.
Response to monounsaturated fats	<div></div> FAVOURABLE	We recommend you to consume 16% of monounsaturated fats daily. They have an important part in your diet, as your reaction to them is favourable.
Response to polyunsaturated fats	<div></div> NORMAL	Polyunsaturated fats should represent 7% of your daily caloric intake. You will find sufficient amounts of them in hazelnuts, almonds, mackerels, etc.
Response to carbohydrates	<div></div> UNFAVOURABLE	Due to your unfavourable response to carbohydrates, we recommend you to lower their daily intake. Restrict it to 50% of daily caloric intake.
Satiety	<div></div> HIGHER TENDENCY	We suggest that you go food shopping with a full stomach, because this way you'll be more likely to buy only those products that you really need.
Weight loss-regain	<div></div> LESS LIKELY TO REGAIN WEIGHT	Your genes determine that for you maintaining weight should be easier in comparison to most of the population. However, it still doesn't mean that you can eat everything you want.

LOW CARB DIET

You are advised to eat foods from all food groups, with emphasis on monounsaturated fats and controlled intake of carbohydrates.

THE REQUIREMENT OF NUTRIENTS

Analysis	Your result	Summary
Vitamin B6	<div></div> LOW LEVEL	Eat foods that contain more vitamin B6 (figs, apricots, chicken), to make sure that your daily consumption of vitamin B6 would be 2300 mcg.
Vitamin B9	<div></div> HIGHER LEVEL	Eat enough vegetables, such as cauliflower, artichoke or cabbage, that will help you to consume recommended 400 mcg of vitamin B9 daily.
Vitamin B12	<div></div> AVERAGE LEVEL	You should increase your daily vitamin B12 intake to 4 mcg. To accomplish that, eat recommended amounts of fish, meat and dairy products.
Vitamin D	<div></div> AVERAGE LEVEL	For consuming 25 mcg of vitamin D daily, we advise you to consume fish (sardines, mackerel) and dairy products.

THE REQUIREMENT OF NUTRIENTS

Analysis	Your result	Summary
Iron	● LOWER LEVEL	We recommend to you seeds (pumpkin, sesame), pistachios, cashews and rice bran, that will take care of the daily intake of 15 mg of iron.
Sodium (salt)	● AVERAGE SENSITIVITY	Eat food, that is poor in sodium – consume less than 1200 mg of sodium daily. To improve the taste of food, use lemon, garlic or mint.
Potassium	● HIGHER LEVEL	You should get 2500 mg of potassium from food daily. Potassium can be found in all food groups (except oils), so we recommend varied diet.
Vitamin E	● AVERAGE LEVEL	Your daily vitamin E intake should be 14 mg. Lot of vitamin E can be found in wheat germ and its oils, almonds, hazelnuts, tomatoes and broad beans.

METABOLIC PROPERTIES

Analysis	Your result	Summary
Alcohol metabolism	● EFFECTIVE METABOLISM	Your alcohol metabolism is effective, but we recommend that you would consume it in moderation (up to 1 dl wine or 2 dl beer per day).
Caffeine metabolism	● SLOW METABOLISM	We do not recommend more than one coffee per day, because it increases the risk for problems with blood pressure and cardiovascular diseases.
Lactose intolerance	● EFFECTIVE METABOLISM	You have an effective lactose metabolism. Consumption of milk and milk products is recommended to you in terms of metabolism of lactose.
Gluten intolerance	● LOW LIKELIHOOD	Gluten most likely does not impact your metabolism. Your diet should remain as diverse as possible. If experiencing the problems written above, try a gluten-free diet.

SPORTS AND RECREATION

Analysis	Your result	Summary
Muscle structure	<div></div> GREATER STRENGTH AND EXPLOSIVENESS	Your muscles are explosive, so you're probably better for example during the short-distance disciplines, gymnastics, badminton and squash.
Strength training	<div></div> NORMALLY RECOMMENDED	Your genes determine that compared to others, you will gain muscle mass easier without accumulating extra fat. Additional caution in these terms is not necessarily.
Heart capacity	<div></div> AVERAGE HEART CAPACITY POTENTIAL	To increase your heart capacity, try to perform very hard exercise for 3-5 minutes, separated by complete recovery between each hard effort.
Muscle volume gene	<div></div> SMALL MUSCLE VOLUME POTENTIAL	Your genetic makeup doesn't give you an advantage in terms of muscle volume gain potential compared to the individuals with one or two "A" copies of IL15RA present.

LIFESTYLE

Analysis	Your result	Summary
Biological ageing	<div></div> SLOWER AGEING	You age slower compared to others. Be careful with unhealthy bad habits (smoking, alcohol, overeating) so you wouldn't worsen your state.
Inflammation sensitivity	<div></div> HIGH SENSITIVITY	To ensure a low level of inflammation, take care of your gut health. Opt for fermented foods rich in probiotic bacteria like yogurt, kefir, sauerkraut or pickles.

CARDIOVASCULAR HEALTH

Analysis	Your result	Summary
Omega-3 metabolism	● DECREASED RISK OF DEFICIENCY	Despite favourable genetic result, this still doesn't mean that omega-3 doesn't have to be an important part of your diet. Fish, flaxseeds and canola oil are high in omega-3.
Omega-3 and triglycerides	● LESS EFFICIENT	If you have increased triglycerides, an omega-3-rich diet may be a less efficient strategy for you. Focus on other strategies, such as regular exercise and limited intake of simple sugars.
Insulin sensitivity	● AVERAGE SENSITIVITY	Include foods rich in fibre - especially those with soluble fibre, such as legumes, oatmeal, flaxseeds, brussels sprouts and oranges.
Adiponectin	● INCREASED LEVEL	Your genes determine higher production of adiponectin. This is positive, since a higher adiponectin level functions more efficiently against cardiovascular complications.



## INSTRUCTIONS FOR READING YOUR PERSONAL DNA ANALYSIS

For a better understanding of your personal DNA analysis, we would like you to read the following instructions.

### Index and an overview of analyses with your advice

A user-friendly index enables you an easy and fast review of all the analyses. In addition, the index itself already contains the results of the analyses, which show the features (nutrients, lifestyle factors) that you have to pay attention to, based on your genes.

The Index is followed by "An overview of analyses with your advice", which features the most important findings and key recommendations for each section separately. A comprehensive summary of recommendations enables you to quickly and easily focus only on the factors that are the most important for you.

### Sections and analyses

Your personal DNA analysis contains 6 sections which thematically capture the key elements of your diet and lifestyle. Every section starts with a summary of results, which is followed by an introduction to the subject of analyses for enabling us an easy interpretation of results.

An individual analysis contains an explanation of scientific research and the analysed genes with the mutations within these genes. Every analysis contains a genetic result and appropriate nutritional and lifestyle recommendations. More detailed explanations of larger analyses can be found at the end of your personal DNA analysis, in the chapter "More about analyses".

#### 1. SECTION THE INFLUENCE OF DIET ON BODY WEIGHT

#### 2. SECTION THE REQUIREMENT OF NUTRIENTS

#### 3. SECTION METABOLIC PROPERTIES

#### 4. SECTION SPORTS AND RECREATION

#### 5. SECTION LIFESTYLE

#### 6. SECTION CARDIOVASCULAR HEALTH

### Results of your personal DNA analysis

For a better understanding, your results are presented in a colour scheme, where each colour has a specific meaning:

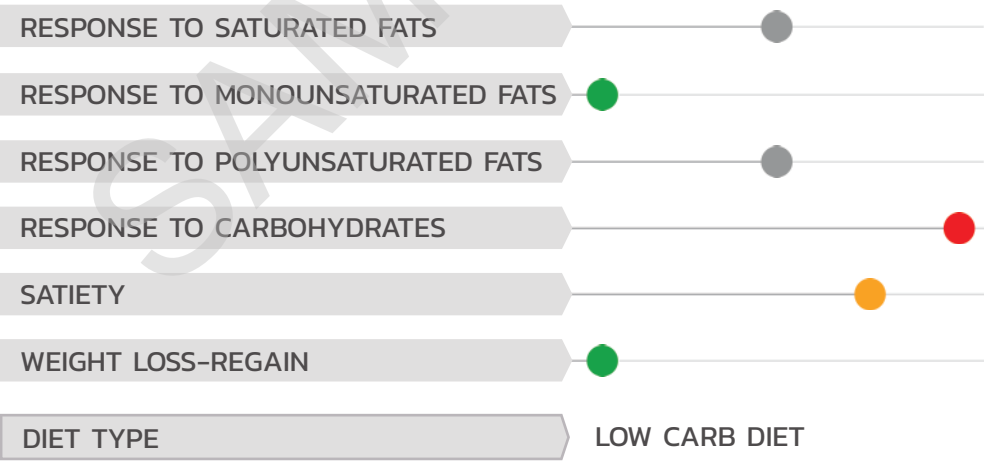


- **Dark green** | Your result is the most optimal; the state simply needs to be maintained.
- **Light green** | Your result is not completely optimal; the state can be improved.
- **Yellow** | Your result is average. If you follow the recommendations, you can do plenty to improve your state.
- **Orange** | Your result is not favourable. For an optimal state we recommend action.
- **Red** | Your result is the least favourable; pay close attention to these analyses.
- **Grey** | Your result is neutral - it defines neither a positive nor a negative status.

# WAY TO YOUR IDEAL BODY WEIGHT

## ADJUST YOUR DIET ACCORDING TO YOUR GENES

Our health is directly related to our diet and eating habits. On one hand, there is a characteristic excessive calorie intake which results in weight-gain, and on the other, there is unhealthy dieting with crash diets which do not have the right effect. In this chapter you will learn how your genetic makeup influences the feeling of satiety, weight loss-regain and how your body responds to different types of fats and carbohydrates. At the end of the chapter we reveal "A diet type" that according to your genetic makeup suits you the best. We advise you to follow our recommendations because the balance between the intake and the use of calories, physical activity and genetic background is the key to optimal body weight and well-being. It is generally not recommended to eat more calories than are actually burned. In addition to a controlled calorie intake, the right choice of foods is also crucial, as certain foods can cause even more harm, while other foods can improve your condition. The fact, that a diet based on genetic analysis is truly effective, has been proven by scientific research performed at Stanford University. The study discovered that people who had been eating according to their genetic makeup had lost 4 kilograms more than those who had been trying to lose weight in no accordance with their genetics.



## RESPONSE TO SATURATED FATS

**Saturated fats** are found mostly in food of animal origin. Our body uses them as a source of energy, but, unfortunately, in connection to the genetic makeup, they also have the property of increasing the risk for becoming overweight. Scientists have discovered from a 20 yearlong study, a gene that causes some people gain weight quicker due to saturated fats than others. They discovered that the saturated fats have even more negative effect on people with unfavourable variant of **gene APOA2**. In case of excessive consumption of saturated fats, they have twice as high risk for becoming overweight, compared to carriers of the common variant of the gene. Despite this fact, people with a risk variant of gene APOA2 do not need to worry: by reducing the saturated fat intake, they can lower their BMI by 4kg/m<sup>2</sup>. Such differences have occurred between people with an unfavourable variant of the gene who have consumed normal amounts of saturated fats and those who have appropriately limited their intake.



YOUR RESULT:

### NORMAL RESPONSE

One of your chromosomes carries a common copy of the gene APOA2 and the other, a rare copy of the gene. Saturated fats, therefore, do not have a negative influence on you. Approximately 48 percent of people in the population have such a genetic makeup, as you have.

### Recommendations:

- Your genetic makeup determines that saturated fats are not additionally unfavourable for you.
- Your daily intake of saturated fats can be slightly higher than for people with an unfavourable variant of the gene; therefore you will follow your daily intake recommendations more easily.
- We recommend that you closely follow your diet recommendations at the end of the chapter, which take into account your response to saturated fats.
- When planning your menu, we suggest you to use the nutrition charts, to make following our recommendations easier.

*Saturated fats affect the transport of calcium, therefore it is not surprising that they are present in maternal milk. They are extremely important for our body, but the problem is their large representation in products of animal origin that can quickly lead to their excess amount.*

#### WHY WE NEED THEM

source of energy for the body

#### CAN OUR BODY PRODUCE THEM

yes

#### THEIR INFLUENCE

increase LDL, slightly increase HDL

#### THEIR ADVANTAGE

more suitable for preparation of hot meals – do not form trans fats

#### WHERE ARE THEY FOUND

animal meat, milk and dairy products, coconut and palm oil

# RESPONSE TO POLYUNSATURATED FATS

**Polyunsaturated fats** are, unlike saturated and monounsaturated fats, essential for our body – our body desperately needs to get them from food, as it cannot produce them. They are vital for a healthy heart and brain function, as well as our growth and development. The most important are the groups of omega-3 and omega-6 fatty acids, whose ratio in our diet should be 1:5; but in a modern-day person, the ratio of omega-6 fatty acids is increasing, which is not very healthy. Even though polyunsaturated fats are very beneficial for our body, they have an even more positive effect for some people.

In a research study on which our analysis is based, it has been discovered that a certain variant of the **gene PPAR-alpha** can determine the relationship between polyunsaturated fats and triglycerides in the blood. It has been proven that people with a risk variant of the gene, and with an inappropriate intake of polyunsaturated fats, have a 20 percent higher triglyceride level compared to other people. And this can have an unfavourable effect on your health. High intake of polyunsaturated fats has completely levelled out these differences, and it is therefore so much more important for people with a risk variant of the gene to adjust their diet and increase the intake of polyunsaturated fats.



## YOUR RESULT:

### NORMAL RESPONSE

You are the carrier of two common copies of the gene PPAR-alpha, which causes you to perfectly normally respond to polyunsaturated fats.

## Recommendations:

- Your genetic makeup determines that you perfectly normally respond to polyunsaturated fats. Nevertheless, do not forget about them because they are very beneficial for your health (they help burn body fat).
- The most important are predominantly omega-3 fatty acids, which are many times overshadowed by omega-6 fatty acids. We advise that their ratio should not be higher than 1:5.
- They can be found in many nuts, seeds and fish; for example, in flax seed and salmon.
- Carefully follow your diet plan revealed to you at the end of the chapter. In it, you will find many instructions. You will also learn which daily intake of polyunsaturated fats is the most suitable for you.
- We recommend you to use nutrition charts, which will enable you to optimally follow our recommendations.

*Did you know that despite the fat abundance of a typical diet, we are mostly suffering a fat deficiency? We are lacking polyunsaturated fats that are essential for adequate functioning of our cells. A simple way to improve this deficiency is to consume mustard oil, which has a high content of polyunsaturated fats.*

### WHY WE NEED THEM

source of energy, growth, development, the functioning of the heart and nervous system

### CAN OUR BODY PRODUCE THEM

no

### THEIR INFLUENCE

visibly reduce LDL and triglycerides and increase HDL

### THEIR DISADVANTAGE

less suitable for preparation of hot meals – non-resistant to heat

### WHERE ARE THEY FOUND

rapeseed oil, corn, flaxseed oil, pumpkin seed oil, fish oil and fish, spinach, peanuts



## WEIGHT LOSS- REGAIN

**Weight loss-regain** can be a never-ending cycle. Statistics shows that about 80 percent of people who lose weight regain their kilos after one year. There are mainly two reasons why this happens:

- 1) people choose restrictive short-term diets, which are hard to follow in the long-term;
- 2) most people lose their motivation to continue with the diet after achieving their goals. However, there's another reason; namely, tendency to gain weight back has also a genetic background.

The **ADIPOQ gene** has various functions, among which is its influence on our successful weight loss. Studies have shown that people with at least one rare copy of the ADIPOQ gene are more likely to be successful in avoiding the so-called yo-yo effect after weight loss. About 20 percent of people worldwide have such a genetic makeup. Conversely, about 80 percent of the population have the common GG genotype and need to put more effort into maintaining weight after weight-loss.



YOUR RESULT:

**LESS LIKELY TO REGAIN WEIGHT**

Your genes have a protective role against weight regain. Only about 20 percent of the population are so lucky.

### Recommendations:

- You are a carrier of a favourable ADIPOQ gene variant which determines that for you maintaining weight should be easier in comparison to most of the population.
- If you decide to lose weight, don't starve yourself! Quickly achieved results are often short-lived.
- Also, your genetic result doesn't mean that you can eat everything you want once you have reached your desired body weight.
- It is important that you develop healthy eating habits which you will be able to follow even after you have reached your desired weight.

*It is recommended to monitor your body weight once a week. Since weight naturally varies throughout the week, researchers have found that Wednesday weigh-ins are somehow the most accurate.*

DIET TYPE

It is much easier to tell what is unhealthy in general for all of us, than to answer the question about what type of diet is most suitable for an individual. The reason for this is the genetic makeup, which determines the suitability of a specific diet plan for our body. This is precisely why one diet can be very successful for one person, but does not work for someone else, or it can even have a negative effect.

The diet that we recommend is not merely coincidental, but it is based on your genetic makeup. The diet based on your personal DNA analysis considers your individual characteristics and allows you to eat what your body truly needs.

YOUR RESULT:  
LOW CARB DIET

We recommend you to choose diverse food from different food groups, but pay attention to control your carbohydrate intake. Be careful when you consume them, because an excessive intake has a negative effect on your health.

Your daily caloric intake, which is in accordance with your genetic profile, is presented in the chart below. Genes, namely, regulate the amount of energy that your body uses in resting, and this is why we were able to adapt our recommendations according to your genetic makeup. Do not forget to consider your daily physical activities, as the calorie consumption increases with physical activity, and it decreases on your less active days.

An optimal daily calorie intake:

Age	Exclusively sitting Activity with little activity in free time	An occasionally higher use of energy for walking and standing activities	Regular moderate physical activity	Intensive physical activity
	kcal/day	kcal/day	kcal/day	kcal/day
1 to 4*	1100			
5 to 7*	1500			
8 to 10*	1900			
11 to 13*	2300			
14 to 19	2444	3009	3573	3949
20 to 25	2396	2949	3502	3871
26 to 51	2251	2771	3290	3637
52 to 65	2076	2555	3034	3353
over 66	1975	2430	2886	3190

\* Independent of physical activity

With the help of **genetic analysis**, we have also determined the percentage of daily calorie intake represented by saturated, monounsaturated and polyunsaturated fats, carbohydrates and proteins. The calories can be easily transformed into grams by using the following method:

- 1 gram of protein or carbohydrates is 4 kcal
- 1 gram of fat is 9 kcal

**Example:** 10 percent of monounsaturated fats in a daily intake of 2000 kcal is 200 kcal, which is approximately 22 grams (200/9) of monounsaturated fats.

Your recommended daily percentages  
of basic nutrients:

Nutrient	Your response	Daily intake (%)
Saturated fatty acids	NORMAL	10
Polyunsaturated fatty acids	NORMAL	7
Monounsaturated fatty acids	FAVOURABLE	16
Carbohydrates	UNFAVOURABLE	45-50
Proteins		17-22

Recommendations:

MEAT AND FISH

You shouldn't opt for meat more than 4-times a week. Instead of beef and pork, try to opt for turkey meat more often, as it is healthier.  
Choose lean parts of meat and meat products which are prepared out of whole chunks.  
Fish should be on your menu at least once a week. We recommend mackerels, tuna or salmon.

MILK AND DAIRY PRODUCTS

Drink a glass of milk, or eat yoghurt every day. Yoghurt contains probiotic bacteria which regulate our digestion. Have a whole wheat bun with your yoghurt or add it to your favourite cereal.  
Make a cheese spread out of cottage cheese, and spread it on a slice of bread.  
Instead of fruit yoghurt, which has a lot of added sugar, have a regular yoghurt or kefir.  
Every now and then, prepare milk rice or similar milk dishes (milk millet porridge, milk semolina).

OILS, NUTS AND SEEDS

When preparing food, do not exaggerate with oil. Add only a necessary amount of it. We recommend walnut oil, virgin olive oil or sunflower oil.  
Choose more often food which contains plenty of monounsaturated fats. Macadamia nuts and hazelnuts will additionally enrich your dishes.  
Every day, eat, for example, a large spoonful of ground flaxseeds and a spoonful of pumpkin seeds.  
From this food group we especially recommend sesame seeds and Brazilian nuts.  
Prepare yourself a nutritious meal by mixing nuts with a handful of raisins or dried cranberries.

LEGUMES, VEGETABLES AND STARCHY FOODS

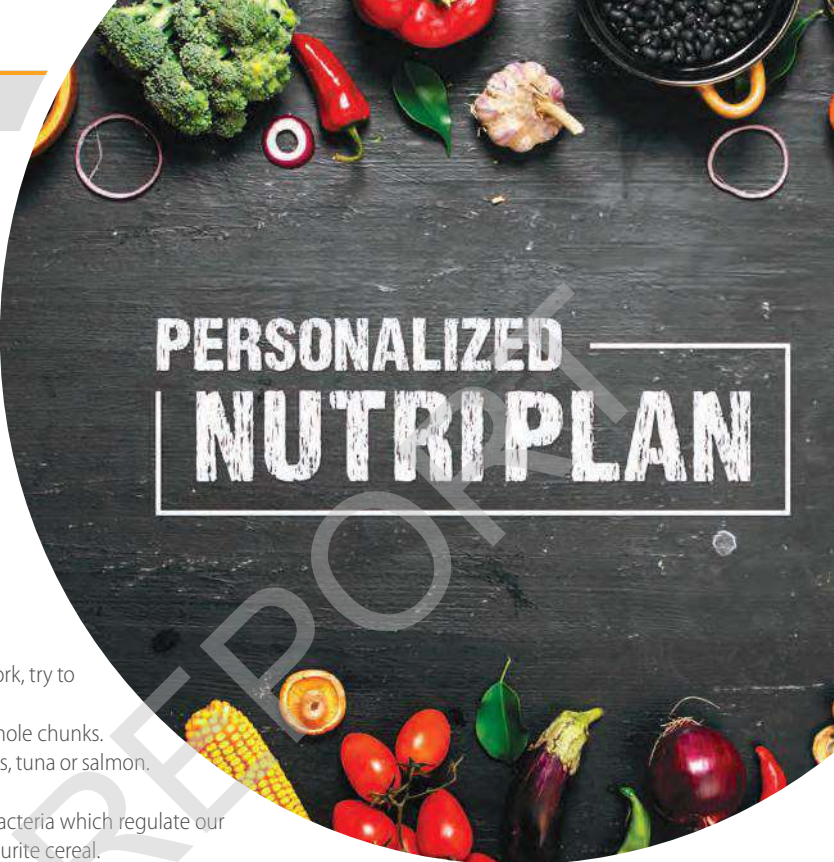
Your diet should contain mostly complex carbohydrates. We recommend that you eat enough legumes, especially peas, barley, soy, leek, kohlrabi, cauliflower, mangold, lamb's lettuce, lentils and dandelion.  
These foods contain fibres, which will lead to an early satiety feeling, and, consequently, will help you to consume fewer carbohydrates.  
Prepare them as salads or side dishes, but they can also represent your main course.  
We also recommend porridge dishes made of spelt or barley. Mix one ladle of such porridge with mushrooms or cooked vegetables.  
Other sources of carbohydrates should include unmilled rice, whole wheat or black bread, bran, kale, fennel, leek and mangold.  
If your meal consists of rice, potatoes or pasta, do not eat bread with it. Also eat as little bread as possible with salads prepared out of legumes.

FRUITS

Throughout the day, eat at least two of the following fruit items: a handful of raspberries, blueberries, black currant, strawberries, a pear or an apple.  
Fruits contain a small amount of calories, but plenty of vitamins and minerals, and they should, therefore, be at hand at all times. Instead of biscuits, ice-cream or cakes, which can quickly contribute to the surplus of the daily carbohydrate intake, your snack should consist of fresh or dried fruit.

GENERAL RECOMMENDATIONS

Eat at least 5 meals a day: breakfast, morning snack, lunch, afternoon snack and dinner.  
Opt for fresh and unprocessed foods. Pre-prepared food contains a lot of unhealthy additives.  
Avoid frying. Stewing in own juice or boiling is definitely more recommendable.  
Substitute white bread with whole wheat bread, as well as white pasta with dark pasta.  
Instead of sweetened drinks or artificial beverages drink water or diluted fresh squeezed fruit juice.  
In general, avoid sweetening hot drinks or other beverages.

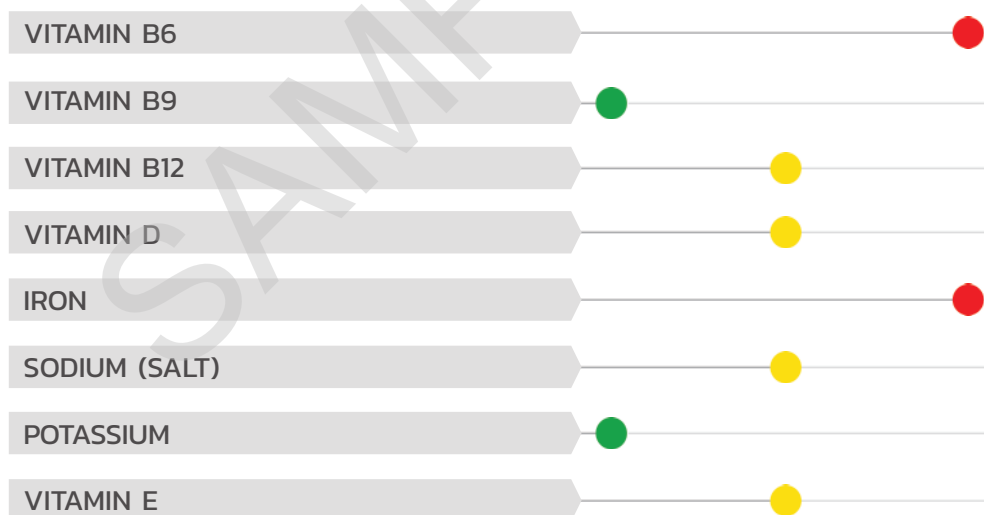


# WHICH VITAMINS AND MINERALS DOES YOUR BODY NEED?

## MICRONUTRIENTS PLAY AN IMPORTANT PART IN YOUR HEALTH

Micronutrients, which include vitamins and minerals, are vital for our health. They are essential for the functioning of our organism; they improve our well-being and prevent many diseases. Their daily requirements are determined by numerous factors, and among them is also our genetic makeup. It determines which vitamins and minerals we have to consume in an increased amount, or vice versa, and which of them we have in sufficient amounts and we simply have to maintain their levels. We can get almost all of the vitamins and minerals with regular food. However, this can be slightly more difficult in case we are prone to the lack of them. In such cases, food supplements are a good option.

In this chapter, we will reveal to you what levels of vitamin B complex, vitamin D and E and also minerals, such as iron and potassium, are determined by your genes. In addition, you will also learn how sensitive you are to kitchen salt or sodium. The latter can be specifically adjusted with an appropriate intake of vitamins and minerals.





# VITAMIN B6

**Vitamin B6**, also known as pyridoxine, has numerous functions which are extremely important for our health. More than 100 enzymes, involved in the metabolism of fats, need it for their function, and it is crucial for red blood cell metabolism and for the functioning of the nervous and immune system. All of this confirms its key role in achieving optimal health. Some people are genetically prone to having a lower level of vitamin B6 in their body, which also, among other things, depends on the variant of the ALPL gene. In the study, on which this analysis is based, people with an unfavourable copy of the **ALPL gene** had an approximately 20 percent lower level of vitamin B6. People with two unfavourable copies of the gene ALPL gene had, in comparison to people with two copies of favourable genes, up to a 40 percent lower level of vitamin B6. The reason for such differences is less effective absorption of vitamin B6 in people with an unfavourable variant of the ALPL gene. As a result they have a higher requirement of vitamin B6.



## YOUR RESULT: LOW LEVEL

**You are the carrier of two unfavourable copies of the ALPL gene, which determines a 40 percent lower level of vitamin B6. Approximately 25 percent of people have such a genetic makeup.**

## Recommendations:

- Your genetic makeup determines a less efficient absorption of vitamin B6 and we advise you to increase its intake. It is recommended that you consume on average 2300 mcg of vitamin B6 per day.
- It might look almost impossible to fulfil these requirements, but it is not so. With the help of nutrition charts you will see that vitamin B6 is found in almost all of the foods, so we believe that you will succeed in following our recommendations.
- The highest amount of vitamin B6 is found in chicken liver, sardines, avocado, dried figs and apricots, walnuts, pistachios and garlic.
- We also recommend foods that contain magnesium, as it improves the absorption of vitamin B6. Good sources of magnesium are pumpkin seeds, peanuts, walnuts and hazelnuts.
- Vitamin B6 is the main component of B-complex preparations, which you can use on days when you do not fulfil your daily vitamin B6 requirements with regular food.

### WHY WE NEED IT

fat metabolism, appropriate functioning of the nervous system, a healthy skin

### EFFECTS OF THE LACK

muscle cramps, disruption in the functioning of the nervous system, skin changes

### WHERE IS IT FOUND

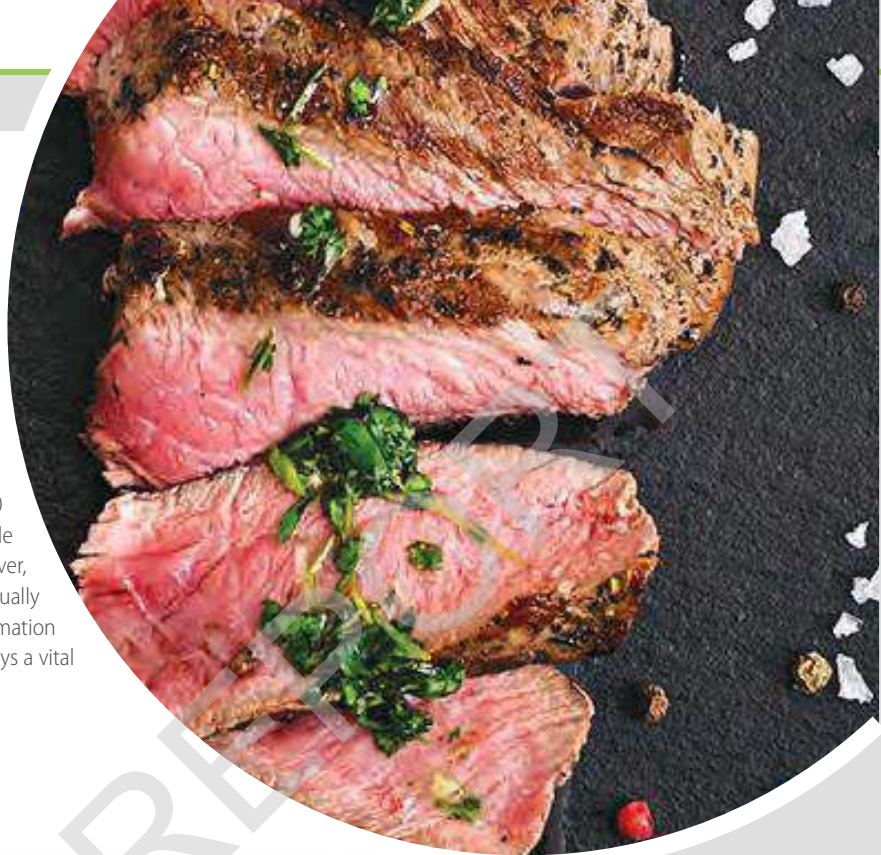
yeast, liver, legumes, fish, whole heat cereal

*Vitamin B6 is also called pyridoxine, but not always has it been called this way. In 1936, when it was discovered, was its name a synonym for "anti-dermatitis factor", since scientists revealed that it can cure the skin disease dermatitis. Vitamin B6 is still used today for different types of skin infections.*

# IRON

**Iron** is a mineral which is needed for a healthy blood and an adequate functioning of numerous enzymes. Although the problem is mainly its lack, some people actually have an excess of iron. In order to avoid the two extremes, the iron level in our body is carefully regulated.

One of the genes that are in charge of the appropriate iron level in our body is the **gene HFE**. In some people it is dysfunctional, and this results in a too high iron level. According to scientific articles, 80 percent of people that have a too high iron level have an unfavourable variant of the HFE gene present on both of their chromosomes. However, among these, only 28 percent of men and 1 percent of women actually developed signs of excess iron accumulation in the body. This information proves that apart from the high importance of genes, our diet also plays a vital role, since it determines 70 percent of the final iron level.



## YOUR RESULT: LOWER LEVEL

Our analysis has shown that you have unfavourable copies of the analysed genes present, which determines a genetic tendency for a lower iron level.

## Recommendations:

- Your genotype determines a lower iron level, which is unfavourable, and we advise you to increase your daily iron level to 15 mg.
- We recommend pumpkin seeds, pistachios, cashews, poppy and sesame seeds, rice bran and clams, where the biggest amount of iron is found.
- In order to accurately follow your daily requirements, we recommend a regular use of nutrition charts, in which you should check which foods contain plenty of iron.
- In addition, we recommend eating carrots, apricots, grapes and tomatoes, which contain beta-carotene and vitamin C. The latter actually increases the absorption of iron into the body.
- You should also consider food supplements, which contain iron in many forms.

*Although most people believe that their iron levels improve most effectively with the consumption of beef, it is actually dark chocolate that contains three times more iron. In addition to dark chocolate, more iron is present even in some grains and nuts than in meat. This fact is crucial especially for vegetarians.*

### WHY WE NEED IT

oxygen supply to the body,  
enzyme function

### THE EFFECTS OF THE LACK

anaemia, fatigue, weakened  
immune system

### WHERE IS IT FOUND

pork, beef, liver, red meat,  
mussels, egg yolk, nuts, beans,  
oatmeal





# VITAMIN E

**Vitamin E**, also known as tocopherol, is the most important representative of fat-soluble antioxidants. Its importance is illustrated by the fact that certain people lacking vitamin E, are more prone to chronic diseases, while people with a higher vitamin E level have less health problems and even slightly better physical abilities.

The scientists have started to ask themselves why differences in vitamin E levels among people even occur. They have discovered that the reason is not only food. Scientific research has proven that a favourable mutation can occur in the gene APOA5 increasing the vitamin E level. People with such a genetic makeup have already a higher vitamin E level to start with, and they, as a result, need a lower daily intake of vitamin E for an optimal state. People with a common variant of the APOA5 gene have to include foods with more vitamin E into their menus, in order to ensure an optimal state.



YOUR RESULT:

**AVERAGE LEVEL**

Your genetic makeup determines an average vitamin E level, but, in comparison to people with one or two favourable copies of the APOA5 gene, your vitamin E level is lower.

## Recommendations:

- You are the carrier of the most common genetic makeup, but this does not represent the most optimal result.
- We recommend you to consume 14 mg of vitamin E daily. This is a slightly higher intake than usual, which will enable an optimal vitamin E level in your body.
- We advise you to eat more vitamin E rich food. Plenty of vitamin E can be found in wheat sprouts and their oil, almonds, hazelnuts and broad beans.
- With less than a teaspoon of wheat sprouts you already fulfil your daily requirements, and we are convinced that with an appropriate choice of foods you will easily fulfil your daily vitamin E requirements.
- Some of the vitamin E is lost with baking, roasting and sautéing, so your source of vitamin E should, predominantly, be fresh vegetables, nuts, seeds and quality oils.
- We recommend that you store foods in the dark, because vitamin E is sensitive to light.
- When shopping, read the food labels and be sure about the amount of vitamin E that a certain product contains.

*Vitamin E is present in eight different forms, which differ in biological activity. The most active and also the most common form of vitamin E in the body is alpha-tocopherol. The synthetic form of alpha-tocopherol is only about half as active as the natural, therefore it is needed to consume twice the amount for the same effect.*

### ROLE

protects against oxidative stress

### CONSEQUENCES OF ITS LACK

The build-up of free radicals

### WHERE IS IT FOUND

olive oil, wheat sprouts, cabbage, corn, soy, wheat, rice, avocado, olives, carrots, tomato, almonds

# THE EFFECTIVENESS OF YOUR METABOLISM

## GENES HELP YOU LEARN ABOUT YOUR BODY'S METABOLISM

Our body, with the help of specific enzymes, processes or breaks down lactose, caffeine, gluten and alcohol after their consumption. This enables them to be used as nutrients, or prevents these substances from becoming harmful. If a certain enzyme does not function optimally, an inappropriate adaptation can lead to certain health problems.

Lactose intolerance is one of the well-known phenomena, where lactase, an enzyme which is responsible for the breaking down of milk sugar lactose, is lacking. In case of lactose intolerance, our organism cannot break down milk sugar, and lactose intolerant people have many problems, such as diarrhoea, bloating and vomiting, when eating dairy products. Among important processes are also the metabolism of alcohol, caffeine and gluten. For all of them, a slow and ineffective metabolism is problematic. In this chapter you will find out about your response to those substances and according to your genetic makeup, you will be given the most suitable recommendations.





## ALCOHOL METABOLISM

Have you ever wondered why some people's faces become red and they experience headaches, nausea and increased heart rate after consuming the slightest amount of alcohol? Well, scientists have succeeded in clarifying this phenomenon on a molecular level. Namely, the reason for this is the defect of the gene which codes for the enzyme ALDH2. This enzyme is responsible for the breakdown of acetaldehyde – an intermediate product in ethanol metabolism, which is even more toxic than ethanol itself. In people with a defect of the **ALDH2 gene**, acetaldehyde accumulates, and this is the reason why they usually avoid drinking. Despite the fact that this defect is more characteristic of Asians, it does occur in other peoples as well.



YOUR RESULT:

### EFFECTIVE ALCOHOL METABOLISM

Your genetic makeup determines an effective alcohol metabolism. Namely, you are the carrier of the most favourable genetic makeup.

### Recommendations:

- Your genetic makeup determines that you don't experience any problems related to the accumulation of harmful substances from alcohol metabolism.
- When drinking alcohol in moderation, you do not get any typical signs such as blush redness of the face, headache, nausea or unpleasant itching and increased heart rate.
- We advise you to drink in moderation, because excessive alcohol drinking can have many negative consequences – medical and sociological ones.
- 1 dl of wine or 2 dl of beer per day is still recommendable, as it increases the levels of good (HDL) cholesterol. However, we do advise against higher amounts of alcohol.
- Despite an effective alcohol metabolism, we recommend that you avoid drinking alcohol during and after physical activity.



*It is well known that the French are not stingy when it comes to using fat in preparing their meals. They eat more butter, cheese and pork than Americans, but their frequency of cardiovascular diseases is lower. The fact that the French consume large amounts of red wine is believed to be their secret for success. Scientists have named this phenomenon the French paradox.*

# LACTOSE INTOLERANCE

**Milk** provides the first and most important nutritional ingredient for every baby and child. With the exception of lactose intolerant people it retains its nutritional value in the diet of adults as well. Lactose intolerant people, though, do not have the enzyme lactase which is responsible for the breakdown of milk sugar lactose, and this is why they have to limit milk consumption. The reason for the absence of the lactase enzyme is the **gene MCM6**, which is actually not functionally related to lactose metabolism, but it regulates the activity of the **gene LCT** (gene which encodes for the lactase enzyme) and it consequently determines whether we will have the lactase enzyme or not.

Lactose intolerant people experience the accumulation of lactose in their colon, where it is decomposed by intestinal bacteria. Various fats are formed, as well as gasses and other molecules. The consequences are diarrhoea, a bloated stomach and stomach cramps. We can also experience nausea or vomiting. These signs occur 15 minutes to 2 hours after the consumption of milk or dairy products, and they depend on the amount of lactose we consume, age and health condition.



YOUR RESULT:

**EFFECTIVE METABOLISM**

**You do not have problems with lactose break-down, as you are the carrier of two favourable copies of the MCM6 gene, which determines a normal level of lactase enzyme. Approximately 57 percent of people have such a genetic makeup.**

## Recommendations:

- Considering the results of the analysis, food, containing lactose, should not cause you problems.
- Your version of genes determines that you have enough of the lactase enzyme, and it is, therefore, unlikely that you are lactose intolerant.
- Eating dairy products is, from the point-of-view of the milk sugar metabolism, for you completely recommendable.
- Milk, yoghurt, kefir or whey are already very healthy in their own right and we, therefore, recommend them.

*According to some estimates, as much as 30 to 50 million Americans have lactose intolerance, most Asians, 60-80 percent of African Americans and 50-80 percent of Latinos. Lactose intolerance is the least common among indigenous peoples of northern Europe, where it occurs in around 2 percent of the population.*

# GLUTEN INTOLERANCE

**Gluten** is a general name for the protein, which is best known for its presence in wheat, rye, barley, kamut, spelt and some others. It helps foods maintain their shape, acting as a glue that holds it together. This is why it's often added to processed and packaged foods. For instance, candy, sauces, snack foods and hot dogs are very likely to contain gluten. Generally, gluten is not bad for your body, unless you are gluten-intolerant. This means your body responds negatively to ingested gluten. There are various forms of gluten related reactions, but the most common ones are: celiac disease, wheat allergy and non-celiac gluten sensitivity. In these cases, a gluten-free diet is recommended, since the organism produces an immune response when breaking down gluten during digestion. The healthiest way is to seek out naturally gluten-free food groups. These include fruits, vegetables, meat, fish, seafood, dairy, beans, legumes and nuts. Also, buckwheat, millet and maize are gluten-free. Try to avoid highly processed foods.

The genes that we have analysed, are **DQA1** and **DQB1**, which tags for HLA-DQ2.5 and HLA-DQ8. Most of the gluten intolerant patients have variant present in both two genes. However, the presence of the variants itself doesn't mean that you are gluten-intolerant, since researches show genetic variants are also present in 30 percent of healthy people. But the percentage of gluten-intolerant patients with the presence of these variants is much higher. More than 95 percent of patients with celiac disease and 50 percent of patients with non-celiac gluten sensitivity have mutations present in both of these two genes. Other types of gluten related disorders, such as wheat allergy or dermatitis, are not linked to the analysed genes.



## YOUR RESULT:

### LOW LIKELIHOOD

Our analysis has shown that your genetic makeup determines lower likelihood for gluten intolerance.

## Recommendations:

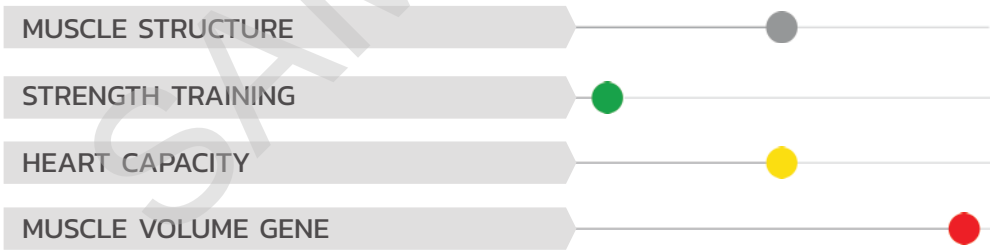
- Your genetic makeup determines that you most probably do not experience any problems when metabolising gluten.
- Based on your genetic result, there's no reason to omit eating food, which for instance contains wheat, rye, barley, kamut and spelt.
- We recommend you to eat as diversely as possible and not to try either omit or increase its intake.
- As already stated, only in 50 percent of people with non-celiac gluten sensitivity the genes that indicate gluten intolerance are found, so there is a chance that you are in the other half. If you experience problems such as gas, bloating, diarrhoea, constipation, and also fatigue, "brain fog" or feeling tired after consuming gluten, consider going on a gluten-free diet and consult with your doctor. Have in mind that gluten can be found in many food products, therefore you need to carefully read the declarations and you should not forget about the sufficient intake of fibers, vitamins and minerals.

*Some promote gluten-free diet as a way to lose weight, or as a healthy diet for the general population. These claims are ungrounded. The gluten-free diet is healthier for people with gluten-related disorders, but there is no evidence that it is beneficial for people who do not have these conditions.*

# SPORTS AND RECREATION IN TUNE WITH YOUR GENES

## DISCOVER THE WORKOUT MOST SUITABLE FOR YOU

In this chapter we will reveal to you the sports activities that you can be good at on the basis of your muscle structure. You will find out how beneficial a certain type of training is for you. Physical activity affects our health generally positively, but certain sports activities are more beneficial for some than they are for others. As an example, scientists have discovered that a certain type of recreation can benefit some people, while the influence of it on others can be less optimal, or can even affect the accumulation of fatty tissue. All this strongly depends on our genetic makeup. For instance, genetics has a great influence over components of the athletic performance such as strength, power, endurance, muscle fibre size and composition, flexibility, neuromuscular coordination, temperament and other phenotypes. And this is precisely why we can, with the help of your DNA analysis, give you supportive recommendations, which help you on your way towards the desired goals.





# STRENGTH TRAINING

Strength training can be defined as the use of resistance for contracting muscles with the objective to acquire strength, size and anaerobic endurance of muscles. If performed correctly, strength training can influence the improvement of overall health and well-being, as well as the increase of bone strength, the health of muscles, tendons and ligaments. It reduces the potential for injury and improves the heart function. Whenever we want to get rid of excess fat, an intensive training is not equally effective for all people. Scientific research studied people who had gone through a 12-week intensive training program. After finishing the program, some people had gained approximately 6 percent more subcutaneous fats. This phenomenon is proven to happen due to our genetic makeup that influences our susceptibility to certain physical exercises. In case of women, these findings are not confirmed. This is not surprising, because both men and women have a completely unique system of fat accumulation and fat-burning.



YOUR RESULT:

**NORMALLY RECOMMENDED**

You have two common copies of the **INSIG2** gene present, and, because of this, intensive strength training is normally recommended for you. 54 percent of people in the population have such a genetic makeup.

## Recommendations:

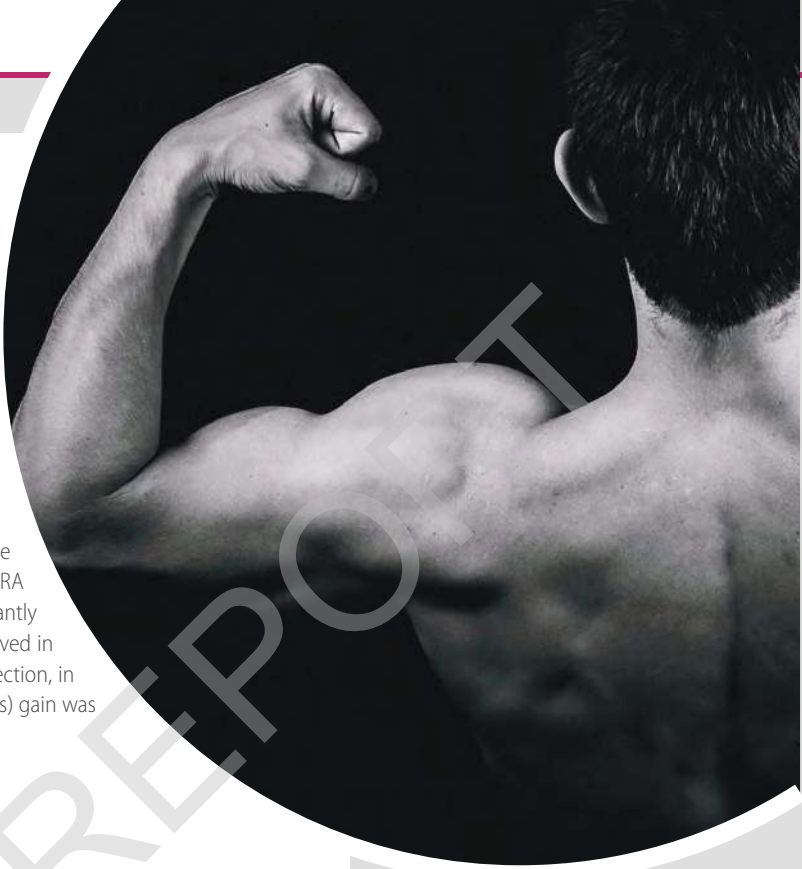
- If you would like to take up strength training, it is normally recommended for you.
- By correctly working-out on fitness machines you will, compared to others, quickly gain muscle mass without gaining excess fat at the same time.
- Consult a fitness trainer before working-out on fitness machines, because he/she will advise you and prepare an appropriate combination of exercises.
- You can also decide on one of the activities from the "Muscle structure" analysis, which are adapted to your muscle structure.
- It is important that you gradually increase your training by slowly increasing the load.

*Did you know why men have more muscle mass? The hormone testosterone is responsible for this – we all have it in the body, but young men have the highest levels. The link between the hormone testosterone and muscle mass is very strong. Intense exercising increases the levels of this hormone, so the muscle strength is also increased.*

## MUSCLE VOLUME GENE

To determine your potential to increase your muscle size (hypertrophy), we analyse a specific gene, called **IL15RA**, which is involved in prevention of muscle breakdown, lean body mass and muscle building in response to training. Your result tells you whether you have a genetic variant present, associated with muscle size or whether you have the version linked to muscle strength in response to resistance training. It's obvious that some individuals respond much better to certain type of training than others. Some individuals look more muscular after one year of lifting than most people do after ten, since our progress largely depends on our genetics.

Studies have shown that IL-15 is an important mediator of muscle mass response to resistance exercise training in humans and that genetic variation in IL15RA accounts for a significant proportion of the variability in this response. Significantly greater increases in total lean mass and arm and leg circumference were observed in those with an A allele. However, muscle strength gain was in the opposite direction, in which the mean relative strength (strength, expressed per kg of your body mass) gain was lower with the addition of each A allele.



### YOUR RESULT:

### **SMALL MUSCLE VOLUME POTENTIAL**

The analysis has shown that your genetic makeup doesn't give you an advantage in terms of muscle volume compared to the individuals with one or two A copies of IL15RA present. However, it gives you an advantage in terms of muscle strength and quality gain after training (e.g. relative strength).

### Recommendations:

- IL15RA gene regulates the bioavailability of the IL-15 protein, a growth factor, expressed in our muscles. IL15RA therefore indirectly affects muscle size and their strength.
- The analysis has shown that you are the carrier of two copies of IL15RA gene, associated with decreased potential for muscle size in response to strength training, while at the same time, you have great potential for more muscles strength.
- In terms of muscle size, you are a "hard gainer" and you don't respond well. As a result of resistance training, people with your genetic makeup can expect to benefit from muscle strength and quality, rather than high muscle volume.
- Of course, the rate and amount of adaptation is highly influenced by genetics, but appropriate training methods will always account for a large portion of training effects.

### HOW DO WE BECOME STRONGER?

We become stronger as a result of body's adaptation to a special stimulus, produced by a muscle loading during resistance training.

That stimulus should be greater than the ones we are used to, otherwise the system "doesn't feel" an urge to adapt. So strength training is quite about leaving the comfort zone behind.

Next, the adaptation is time and type of load dependent. From the TIME perspective, beginners progress pretty fast with weight training since the adaptation is mostly neurologic. It means that our inter-muscular and intra-muscular coordination becomes better. Sometimes, these kinds of gains are called "qualitative", because muscles learn to perform better without getting bigger. Intramuscular coordination refers to an ability of a given muscle to be more engaged in a certain movement. In other words, how effective is the coordination between the muscle fibres of that single muscle. Inter-muscular coordination refers to the ability to coordinate the cooperation, timing and a level of engagement of all the muscles in your body during a certain move or exercise. While some muscles are in charge of moving a limb, others should stabilize the spine or be relaxed enough to "permit" the movement to happen. Usually, the first 2-3 month of strength training mostly improve this (quality) component.

When the ability to gain strength, mostly due to a neurological adaptation, starts to diminish, another form of adaptation permits us to keep on going with the weights. This is called muscle Hypertrophy (check out a corresponding topic for more information). This form of adaptation is called morphologic or "quantitative", since it requires a new tissue formation: the muscles cross sectional area become larger and they have more contractile protein content inside. From the type of training perspective, we can adjust the type of preferable adaptation by "playing" with such components as volume, intensity and tempo (time under tension). While high loads and low repetition sets (RM 1-5) target mostly a neurological component of strength, higher rep's (RM 6-15) are associated with Hypertrophy stimulation, provided all other complementary circumstances are optimal. (Check out our RM chart for more information on this topic).

### HYPERTROPHY AND MUSCLE VOLUME GENE

What factors contribute to a muscle Hypertrophy effect due to resistance training? Although genetics have a great influence on muscle size development potential, there are few more, evidence based factors, that may contribute to a muscle "building" process or, if not considered, to slowing down the hypertrophy gains:

- **Appropriate training protocols**

There is no "one size fits all" formula for muscle building, but usually (and there is much scientific evidence on this topic) the progressive resistance training protocols of 6-20 reps in 2-3 sets for a given muscle group done to momentary muscular failure/fatigue bring a measurable results for intermediate class trainees. Note, that contrary to a common believe, it doesn't matter what kind of an equipment is used for that purpose (e.g. free weights, a body weight, machines or rubber resistance), but the amount of repetitions done to a failure.

- **Nutrition**

It's essential to meet the needs of the exerciser: calorie intake, building material (proteins), proper hydration, vitamins, minerals and similar... For more information about nutrition and recommended intakes for you check out first chapters of the report.

- **A good sleep**

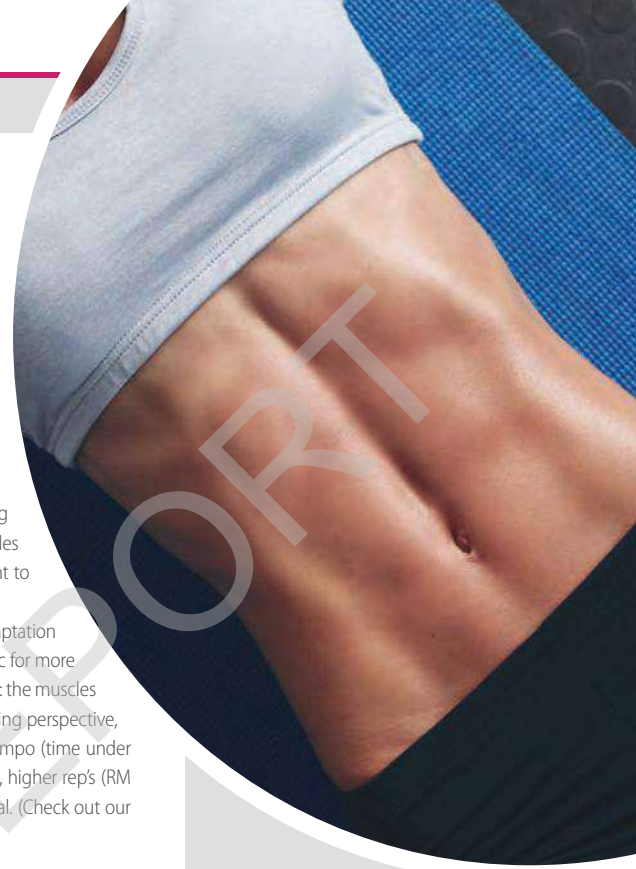
Muscles don't grow while we train. They rather get damaged (undergo microscopic traumas) during heavy lifting. Training triggers an anabolic (tissue building) response and then the time does its job. We grow while we rest and especially while we sleep. Some very important muscle building hormones are released during sleep. Therefore take special care for having a good undisturbed sleep.

- **Focused training type**

For the Hypertrophy cycle/period, limit the unnecessary high energy demanding activities (long distance running or cycling, boxing, step or aerobics classes) to a minimum, because they tend to be extremely catabolic (an opposite of anabolic) from one hand and energy depleting from another.

- **Manage your stress**

High stress levels may slow down your growth, since stress hormones (like cortisol and adrenaline), that produce a sympathetic "background" for a long period of time also have a catabolic effect on muscle tissue. For more information on stress, check out our special stress topic.



# GENETICALLY DETERMINED AGEING AND INFLAMMATION

## YOU CAN INFLUENCE AGEING AND INFLAMMATION

In this chapter we will reveal your rate of ageing in comparison to the average population, and whether your genetic makeup determines that a change of lifestyle is important for you. You will also learn about inflammation sensitivity of your body. Beside genetics, environment and lifestyle also play an important part at ageing and inflammation, so you can do a lot to slow it down.

What is lifestyle, anyway? Lifestyle is a concept which had been established already in the 1929 by an Austrian psychologist Alfred Adler. With this concept, we describe our way of life, or our habits. It is generally known that smoking, alcohol drinking, inappropriate diet and lack of physical activity point on an unhealthy lifestyle and are the cause for many health problems. Excessive alcohol drinking and cigarette smoke additionally influence our ageing process, and, in case you have unfavourable genes which determine a higher rate of ageing, we recommend limiting alcohol and giving up smoking.

BIOLOGICAL AGEING



INFLAMMATION SENSITIVITY





## BIOLOGICAL AGEING

We differentiate two types of ageing, **chronological** and **biological**. In chronological sense, we are as old as our years of age, while biological ageing is the ageing of our body. It is about determining if our body looks according to its age. For example, when saying to 70-year old, that we would never think him to be as old, we actually say that, from a biological standpoint, this person looks younger.

The molecular cause for ageing is in the length of structure, called telomeres. They are the endings of our chromosomes consisting of a repetitive DNA sequence (TTAGGG). In the course of our lives, these telomeres become shorter, and this causes us to age. The rate of the shortening of telomeres depends on numerous environmental factors, as well as on the variant of the **gene TERC**. It has turned out that a mutation in the DNA sequence can occur. This manifests in shorter telomeres and, in average, a 3-4 years higher biological age of an individual with mutated copy of the gene.



YOUR RESULT:

**SLOWER AGEING**

Two favourable copies of the TERC gene determine a slower biological ageing. Approximately 53 percent of people have such a genetic makeup.

### Recommendations:

- Your ageing is slower, compared to other people, but it is important to know that the ageing process is not determined only by the genes, as the actual state depends also on various environmental factors and bad habits.
- The rate of your ageing is, apart from your genes, an expression of your lifestyle, bad habits and diet.
- By strictly following our recommendations you will, undoubtedly, support your favourable genetic makeup and enable a healthy appearance of your body.
- To summarise: we recommend activities in the fresh air, avoiding stress, positive attitude towards yourself and the environment, and, especially, following our advice.



*Did you know that on average women live longer than men? Women have an advantage because of the hormone estradiol, which is a physiological antioxidant and acts as natural protection. In men, testosterone does not have this protective function; therefore, they are more susceptible to harmful elements from the environment.*

## INFLAMMATION SENSITIVITY

Inflammatory response is a vital part of the body's immune response. However, short-term and long-term inflammation should be distinguished. Short-term acute inflammation is a normal process in our body to recover after an injury or illness. It also occurs during recovery after exercise and influences muscle development. On the other hand, prolonged short-term acute inflammation can lead to long-term chronic inflammation and this can further result in cardiovascular complications and some chronic diseases of modern society such as heart disease, atherosclerosis, diabetes, high blood pressure and asthma. Environmental factors that can contribute to the level of inflammation are lack of sleep, excessive stress and poor nutritional choices. Besides, genetics also play an important part in the level of inflammation. The most studied genes in this context are the **IL6, TNF, CRP and IL6R genes**, which all encode for the inflammatory molecules and are as such strongly involved in the regulation of inflammation.



YOUR RESULT:

### HIGH SENSITIVITY TO INFLAMMATION

Your genetic makeup determines high sensitivity to inflammation. This means that your genes determine that your response to inflammatory triggers is strong.

### Recommendations:

- One of the basic measures to "fight" against inflammation is to eat sufficient quantities of foods rich in anti-inflammatory nutrients.
- Include any of the following foods on your menu: green leafy vegetables, avocado, beetroot, broccoli, pineapple, kale, olive oil, walnuts, turmeric or mackerel.
- Consider taking a handful of blueberries or strawberries as a daily snack or include them in smoothies. Namely, berries contain high amounts of anthocyanins, which have been shown to help reduce inflammation as well as chronic disease risk.
- To ensure a low level of inflammation, take care of your gut health. Opt for fermented foods rich in probiotic bacteria like yogurt, kefir, sauerkraut or kombucha.
- We recommend that you limit your intake of foods which contain trans fats as much as possible. Trans fats are formed when processing oils at high temperatures and they then become solid. As a general rule, avoid fried food, margarines, mayonnaise and cakes.
- Also, when buying food read the nutritional labels and check trans fats content.



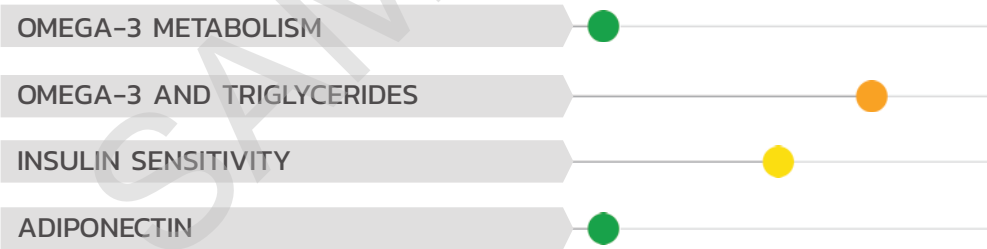
# CARDIOVASCULAR HEALTH

## WITH AN APPROPRIATE DIET YOU CAN PREVENT NUMEROUS HEALTH COMPLICATIONS

Triglycerides are the most common form of fat in the body. Elevated blood triglycerides levels represent an important risk factor for the development of cardiovascular diseases, therefore it is important to keep their level low. Omega-3 fatty acids are among the nutrients which can positively contribute to this.

Omega-3 fatty acids are a type of unsaturated fat and are essential for our body to function normally. We don't naturally produce omega-3 within our body and it is important we take in enough of it as part of our diet. It has been shown that sufficient daily intake of omega-3 can help towards lowering our blood pressure and level of triglycerides and at the same time is responsible for the proper functioning of the cardiovascular system and the brain.

In this chapter, you will learn how effective your metabolism of omega-3 fatty acids is, what is your tendency to high triglyceride levels and how efficiently your body regulates the level of insulin. Knowing your genetic predispositions to these and following the recommendations can lead you to better cardiovascular health.



## OMEGA-3 METABOLISM

**Omega-3** fatty acids are probably among the most known nutrients. They belong to the group of polyunsaturated fatty acids and are important for the proper functioning of the cardiovascular system and the brain. Studies have shown that sufficient daily intake of omega-3 can help towards lowering our blood pressure and level of triglycerides. Numerous members of the omega-3 family known, among which EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid) and ALA ( $\alpha$ -linolenic acid) are the most important. Adequate consumption of ALA is usually not problematic, since ALA is found in many plant seeds and their oils. On the other hand, adequate consumption of EPA and DHA is trickier as they are mostly present only in seafood (fatty fish, algae). To compensate this, our body has the ability to convert ALA into EPA and DHA. However, genetically susceptible people cannot rely on this due to the poor activity of the FADS1 enzyme, which is responsible for ALA to EPA & DHA conversion.

Recent studies have shown that a specific mutation in the FADS1 gene affects enzyme activity, which results in poor efficiency of the conversion described. Individuals carrying the unfavourable variant of the FADS1 gene are therefore at greater risk of EPA and DHA deficiency.



YOUR RESULT:

### EFFECTIVE OMEGA-3 METABOLISM

Analysis of your DNA has shown that you are a carrier of two favourable copies of the FADS1 gene, which determines effective metabolism of omega-3 fatty acids. About 45 percent of the population worldwide has such genotype.

### Recommendations:

- Your FADS1 gene encodes for efficient omega-3 metabolism.
- We recommend that you choose diverse foods, including various sources of all types of omega-3 fatty acids.
- These can include linseeds, walnuts and hazelnuts, which are rich in ALA omega-3 fatty acids.
- If you prefer fish on your menu, mackerel, salmon or tuna are the best sources when speaking about EPA and DHA omega-3 fatty acids content.

*Did you know that omega-3 fatty acids are not beneficial only for our health but also represent a secret weapon for muscle growth? They reduce breakdown of proteins and inflammation, which leads to better recovery after the training.*



### WHY WE NEED OMEGA-3 FATTY ACIDS

they support the functioning of our heart and brain

### DEFICIENCY

greater risk of cardiovascular diseases, joint pain, weight gain, lack of concentration, unhealthy skin, fatigue, eyesight problems

### WHERE CAN WE FIND ALA

seeds and their oils (linseed, hempseed, rapeseed), nuts (walnuts, hazelnuts), soybeans and tofu

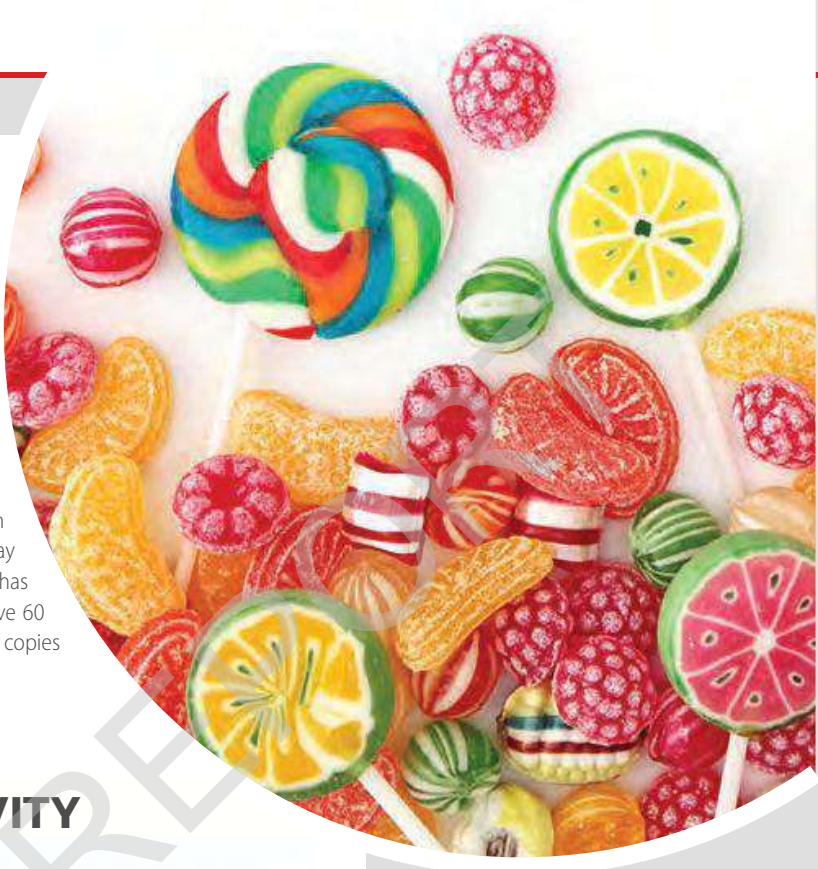
### WHERE CAN WE FIND EPA & DHA

fatty fish (salmon, tuna, sardines) and algae



## INSULIN SENSITIVITY

**Insulin** is a hormone responsible for decreasing our blood sugar after each meal. Individuals with low insulin sensitivity need more insulin to lower their blood sugar levels as their system is less efficient. Their body simply compensates for this by producing more insulin in order to keep blood sugar stable. However, high insulin production is not so favourable and is associated with a variety of health complications, such as damage to blood vessels, type 2 diabetes, high blood pressure and heart disease. This makes insulin sensitivity and insulin blood level a valuable marker of our health. In addition to various lifestyle factors, our genetic background plays an important role in insulin sensitivity. It has been proven that specific genes may protect us from decreased insulin sensitivity. For instance, a recent study has shown that individuals with two protective variants of the **PCSK1** gene have 60 percent higher insulin sensitivity in comparison to those with two common copies of the PCSK1 gene.



YOUR RESULT:

### AVERAGE INSULIN SENSITIVITY

The analysis of your genes has shown that your genetic makeup determines an average insulin sensitivity. About 85 percent of the population have such genetic predisposition.

### Recommendations:

- Besides your genetic makeup, insulin sensitivity depends on many other factors.
- Excess body weight reduces insulin sensitivity and increases the risk of diabetes. If your BMI is higher than 25, you should consider losing some kilograms.
- Include foods rich in fibre especially those with soluble fibre, such as legumes, oatmeal, flaxseeds, Brussels sprouts and oranges. Soluble fibre can help to lower cholesterol, reduce appetite and increase insulin sensitivity.
- Add cinnamon to your tea, milk or yogurt. It has been shown that  $\frac{1}{2}$  to 3 teaspoons of cinnamon per day reduces short- and long-term blood sugar levels.

*In history, diabetic patients received insulin extracted from the pancreas of cattle and pigs. Fortunately, genetic engineering and the development of new technologies has enabled pharmaceutical companies to produce human insulin using laboratory cell cultures nowadays.*