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Healthy Lifestyle

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A healthy lifestyle represents a heterogeneous combination of healthy eating habits (complete, balanced and varied diet), intake of sufficient amounts of fluids, vitamins and minerals, physical activity, absence of unhealthy habits (alcohol, drugs, smoking), healthy circadian rhythm, mental and emotional health, etc.

Healthy eating habits as prevention against chronic noncommunicable diseases

Chronic noncommunicable diseases (CNCDs) are the number one cause of death and disability in developed countries. These diseases kill 41 million people every year and are responsible for 71% of all deaths worldwide.

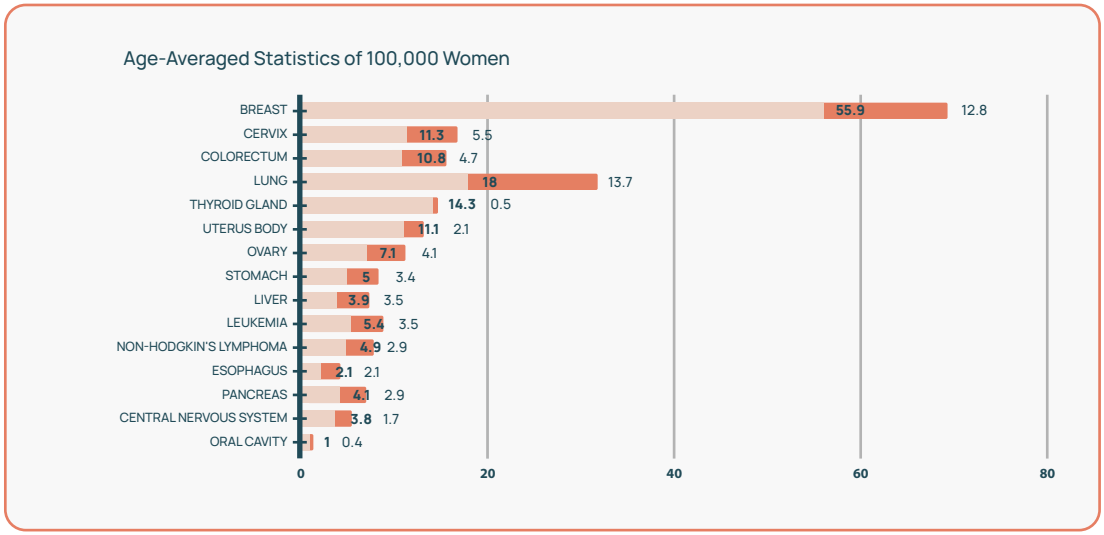
Chronic noncommunicable diseases refer to a group of conditions that are not primarily caused by an acute infection or injury, lead to long-term health consequences and often create the need for long-term treatment and care. These conditions include cancer, cardiovascular diseases, diabetes and chronic lung diseases, autoimmune diseases, etc.
Many chronic noncommunicable diseases can be prevented by eliminating common risk factors such as tobacco use, excessive alcohol use, lack of physical activity and unhealthy diet.

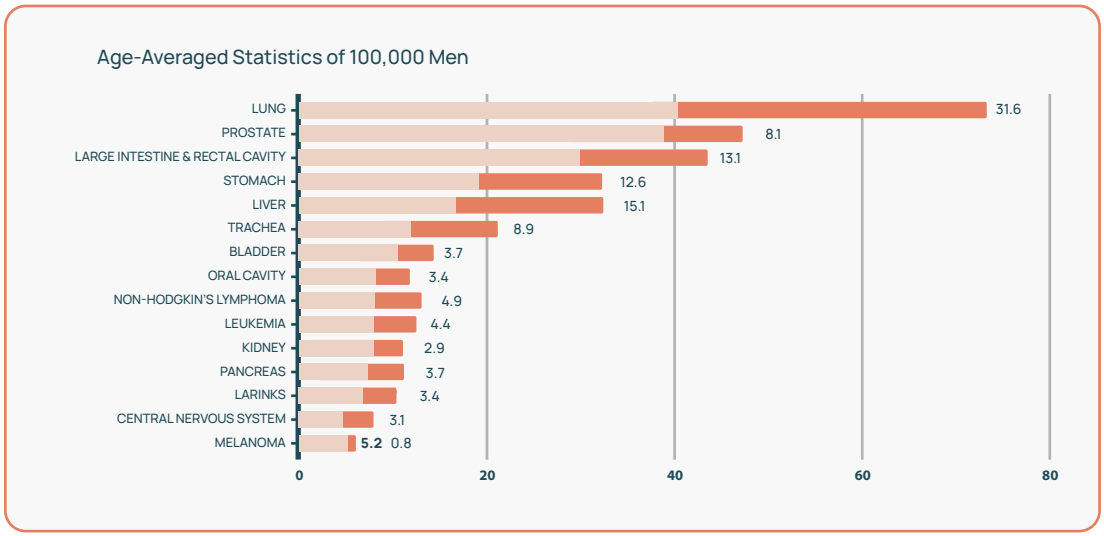
The increased Human Development Index (HDI) is directly related to CNCD incidence. Among all chronic noncommunicable diseases, newly diagnosed cancers have the strongest correlation with the Human Development Index. The chart below illustrates the difference between the incidence and mortality of different cancers between countries with high and low Development Index.

Oncological Morbidity

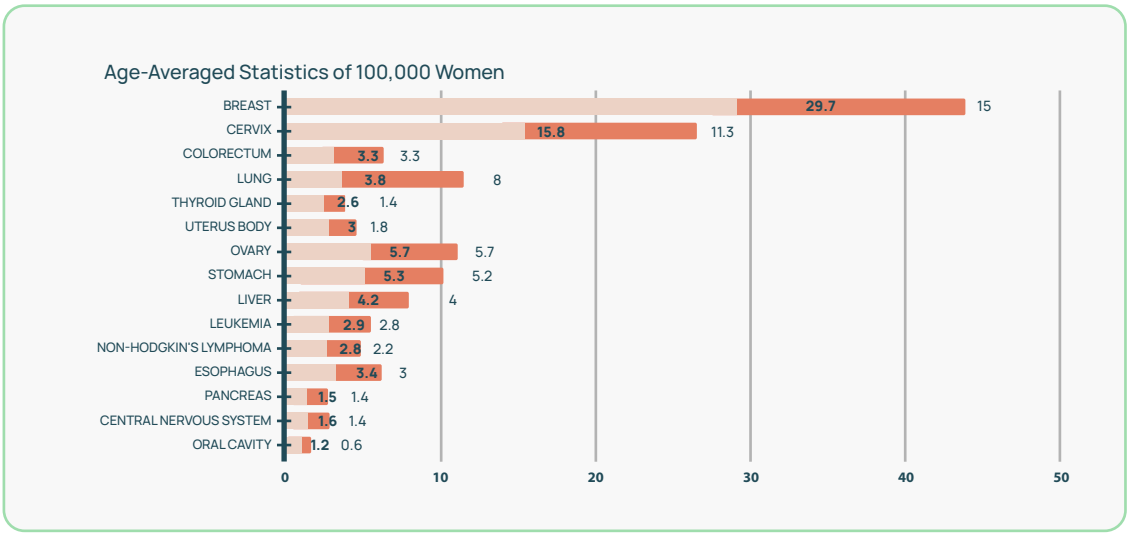
Oncological Death Rate

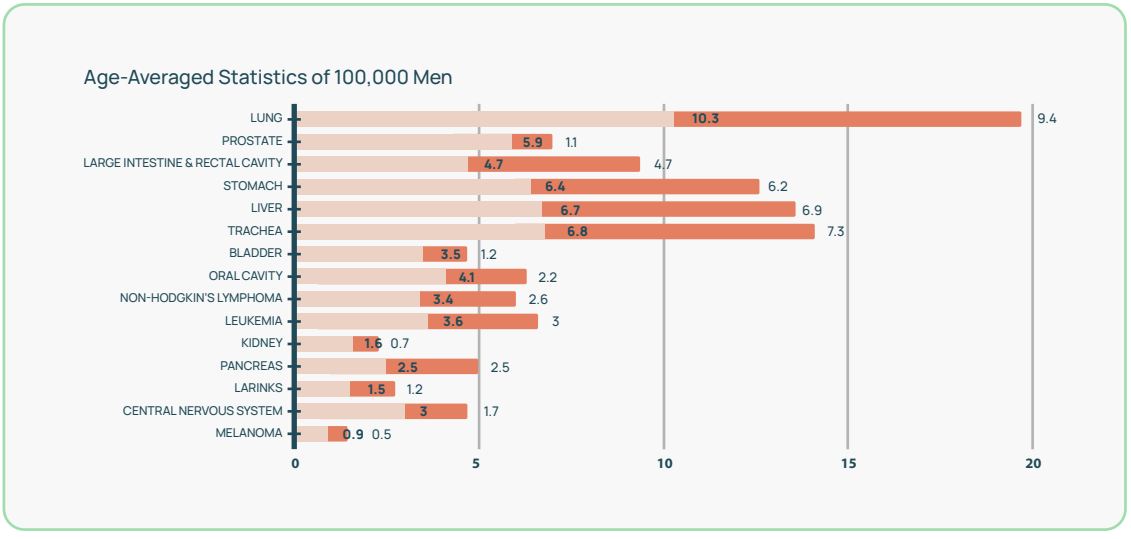
High Modernization Index





Low Modernization Index





Hectic and at the same time sedentary lifestyle of modern times, mental and emotional distress, lack of healthy dietary and physical culture, polluted environment and difficulty in accessing quality food products have determined the statistical boom of cancer diseases in the 21st century, highly dependent on both genetic and external factors.

Paradoxically, however, not all high HDI countries have the same cancer incidence. The explanation is reduced to several key differences in everyday living, culture and lifestyle of the inhabitants of these countries:

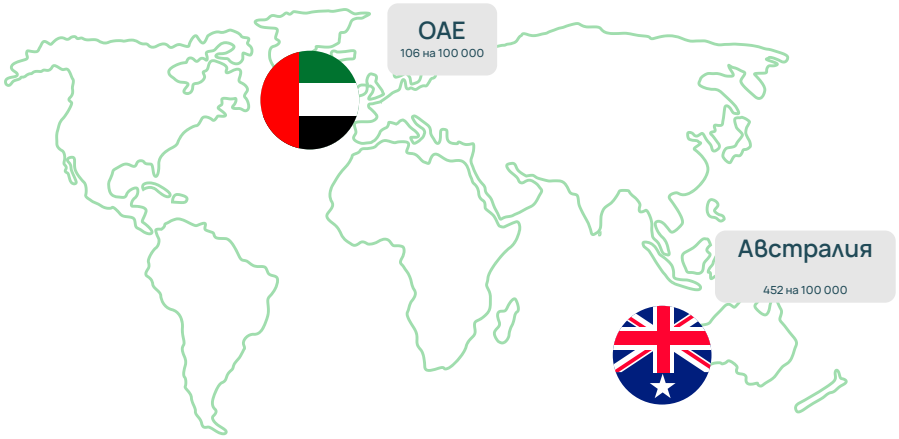
Comparative analysis

Comparing the statistics of the countries with the highest number of diagnosed cancers per 100,000 people, we see that Christian countries with developed healthcare systems, a Western dietary pattern and no strong religious lifestyle prevail. Australia (452), New Zealand (422), Ireland (372), the United States (362), Denmark (351), etc. top this ranking.

Looking at the statistics for the countries with the lowest number of diagnosed cancers per 100,000 people, we see that Muslim countries with moderately well-developed healthcare systems, an Eastern Mediterranean dietary pattern, a strict religious lifestyle (observing religious fasting, avoiding certain foods) prevail.

Representatives of such countries are Saudi Arabia (96), Yemen (97), Oman (103), the United Arab Emirates (106), Qatar (107).

A direct comparison between Australia (452 cases per 100,000) and the United Arab Emirates (106 cases per 100,000), two high HDI countries, shows a more than fourfold difference in cancer incidence between the two countries due largely to:



Significant difference in daily use of herbs and extracts

Researchgate statistics demonstrate a significant difference in the knowledge and habits of an average member of the said countries for the use of foods, herbs and extracts both in daily cooking activities and as alternative traditional medicine for the treatment of various trivial pathological conditions such as acne, cough, constipation and headache in favor of the United Arab Emirates.

Significant difference in daily alcohol use

Statistics show that the average annual alcohol use in the United Arab Emirates is about 3.85 liters of hard alcohol per capita, while in Australia it is 10.36 liters.

Difference in healthy eating habits

High consumption of processed foods, salt and sugar and low consumption of fish, whole grains, legumes, fruits, vegetables and nuts in daily life are associated with both increased risk of cardiovascular and metabolic diseases and increased cancer incidence. Global Nutrition Report statistics show a nearly threefold difference in annual cancer mortality associated with unhealthy eating habits in these countries (about 14,000 for Australia and 5,000 for the UAE per every 1 million people). In addition, reduced consumption of some of the more unhealthy foods such as pork red meat is reported in the UAE as part of their culture and religion.

Fasting

In Muslim countries over 90% of the population practices mandatory religious fasting (Ramadan), which is practiced for 1 month every year and is a 14-hour abstinence from food and water during daylight hours. Such abstinence is known as moderate fasting in Western countries. Moderate fasting has a number of health benefits, including weight regulation, improved blood sugar levels, reduction of inflammatory processes in the body, improved heart health and reduction of cancer risk.

The health effects of moderate fasting are thought to result from the induction of cell autophagy processes. Autophagy is an important process required to maintain proper cellular homeostasis. It is responsible for the disposal and recycling of metabolic macromolecules and damaged cell organelles by inducing cellular lysosomal degradation processes. Under stressful conditions, including nutrient deficiency, autophagy is significantly activated to ensure maintenance of proper cell function and survival of healthy cells.

Conclusion

There are obvious differences in the daily lifestyle of the average members of these territories, including healthy eating habits, such as increased intake of fruits, vegetables, nuts, herbs, fish and seafood and reduced intake of trans fats, red meat, processed meat products and alcohol. There are also huge statistical differences in the percentage of the population observing some form of diet, eating and fasting regimen or religious fasting.

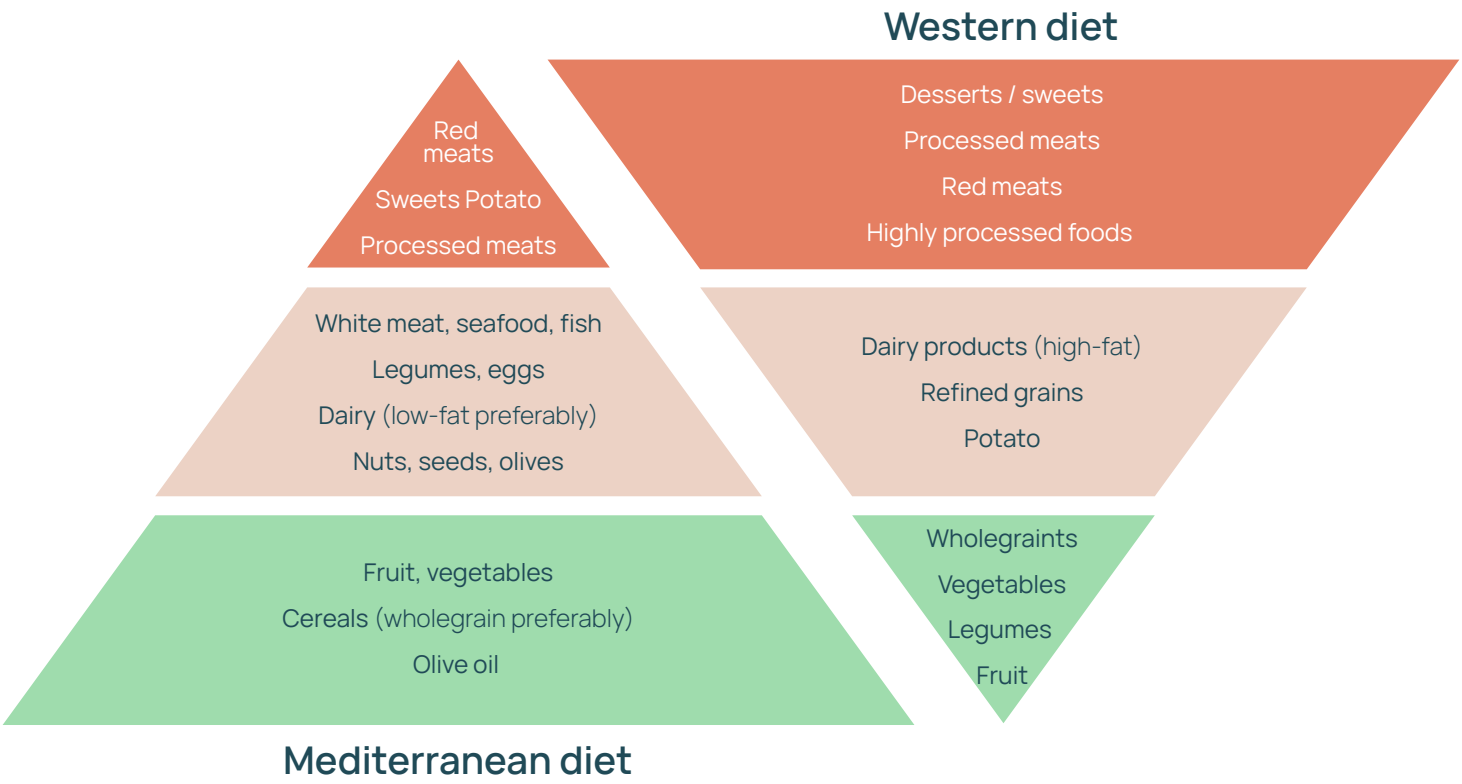
Taking also into account the fact that the lower cancer incidence in the UAE is in the presence of additional negative factors, such as lower average physical activity, higher smoking rate, higher obesity rate, lower healthcare budget, similar average age and higher index of polluted environment, the importance of healthy food, low alcohol use and good dietary culture is further emphasized as one of the main preventive measures against development of both cancer and other chronic noncommunicable diseases.

Healthy diet

Mediterranean diet and Western diet as two opposite sides of the same coin

The Western diet is characterized by consumption of higher amounts of processed and refined foods rich in salt, added sugar, fats added through frying and breading, increased use of alcohol, sweets and desserts, processed meat products and red meat, and lower amounts of a variety of products in their natural form such as nuts, fruits and vegetables, natural spices, fish and seafood. This dietary pattern has been associated with development and exacerbation of many chronic diseases – obesity, cardiovascular diseases, oncological diseases, endocrine diseases, autoimmune diseases, etc.

The Mediterranean diet is considered one of the most healthy diets in the world and represents the absolute opposite of the Western dietary pattern.



Data from multiple clinical studies show that the Mediterranean diet is associated with a reduced risk of cardiovascular diseases and metabolic syndrome, a reduced risk of type 2 diabetes and dyslipidemia, reduction in inflammatory markers and a reduced risk of cancer death compared to other diets. Its health effect is attributed to the increased intake of healthy nutrients such as:

1. High intake of complex carbohydrates from whole grains, high-fiber fruits and vegetables, plant polyphenols, polysaccharides, alkaloids, saponins, etc.

A high daily intake of polyphenols from a variety of foods (over 600 mg/d) is associated with a healthy gut microbiome function, reduction of inflammatory reactions and oxidative stress and reduction of the risk of developing chronic noncommunicable diseases and death.

2. High intake of marine-derived biologically active Omega-3 unsaturated fatty acids – eicosapentaenoic and docosahexaenoic acids (EPA and DHA)

As a result of following this diet the overall ratio between consumption of Omega-3 EPA/DHA and Omega 6/9 fatty acids is improved, excessive consumption of saturated fatty acids of animal origin is reduced and intake of unhealthy trans fats is highly limited. This improved balance of dietary fats is associated with reduced production of proinflammatory signaling molecules (prostaglandins, interleukins and leukotrienes) and an improved lipid profile, resulting in reduction in the risk of multiple chronic and inflammatory diseases.

3. Intake of protein from high-quality nutritional sources

The Mediterranean diet is associated with consumption of unprocessed foods high in protein of animal origin (chicken breast, shrimp, fish, turkey, beef) and plant origin (lentils, beans, chickpeas, oats, soybeans), whereby intake of additional unhealthy food groups, such as simple carbohydrates, saturated fatty acids and trans fats, is reduced.

This diet restricts consumption of processed foods lower in protein and higher in unhealthy nutrients (smoked salami, salted cold meats, some dairy products), thereby reaching as clean protein intake at mealtimes as possible.

4. Vitamins and minerals

Vitamins and minerals play an essential role in maintaining normal cell functions and growth and development processes. They are required for many enzymatic processes, electrolyte balance, nerve impulse generation, bone matrix formation, hormone regulation, wound healing and many other physiological processes. The Mediterranean diet promotes nutritional diversity with intake of many unprocessed foods of plant and animal origin, sources of all necessary vitamins and minerals, thus preventing the development of their deficiencies in the body.

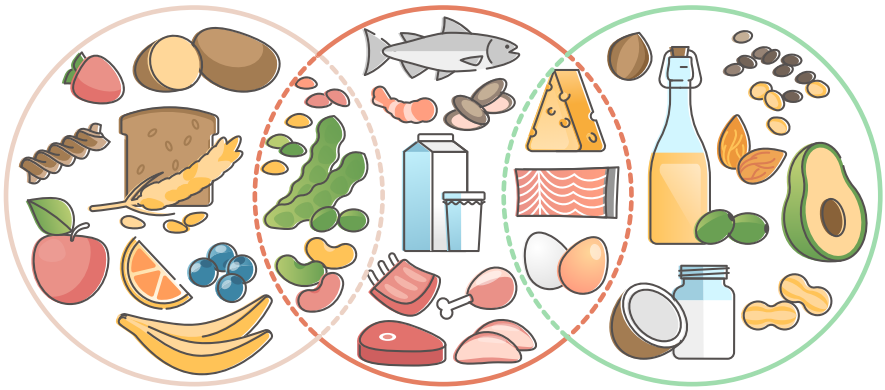
Recommended intake of calories and macronutrients

The recommended daily calorie intake is measured according to height, weight and physical activity and usually ranges between 25-30 kcal/kg/day.

On average, the recommended calorie intake required to maintain body mass is 2,000 calories a day for women and 2,500 calories for men.

The recommended balanced macronutrient ratio is:

- **Carbohydrates:**
  45 to 65% of daily calories
- **Proteins:**
  10 to 35% of daily calories
- **Fats:**
  20 to 35% of daily calories

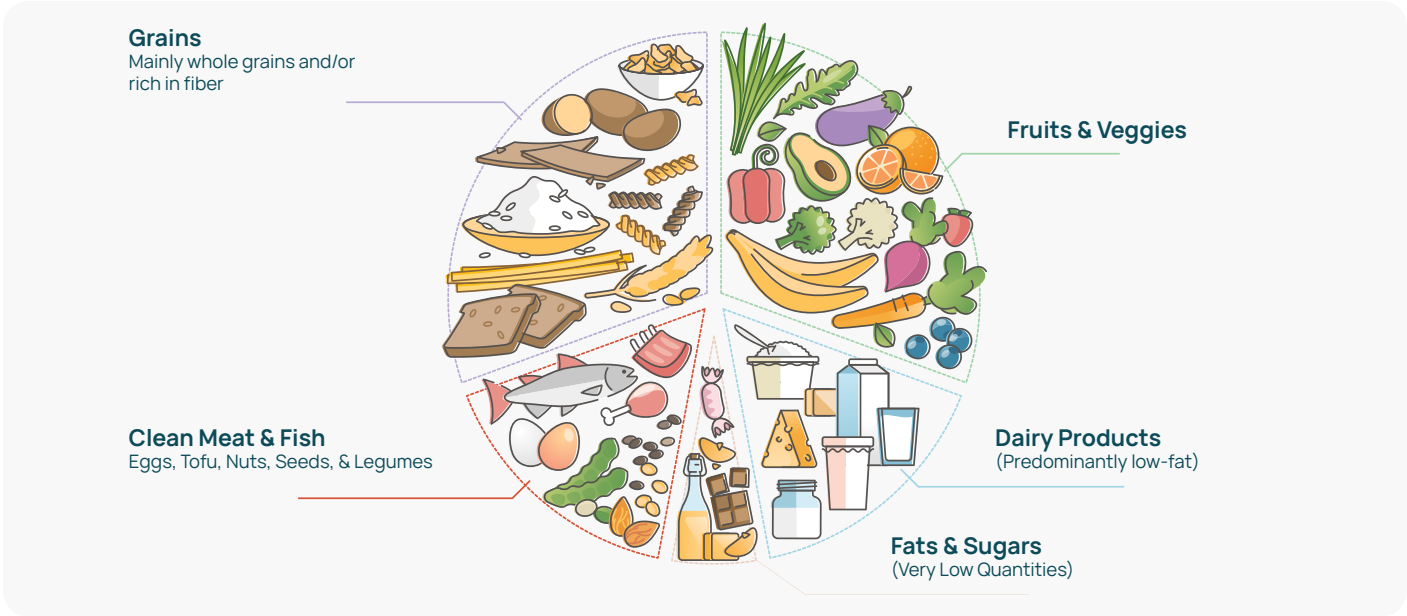


CARBOHYDRATES 45%

PROTEINS 25%

FATS 30%

Intake of all proteins, fats and carbohydrates should be from healthy nutritional sources illustrated in the figure below:



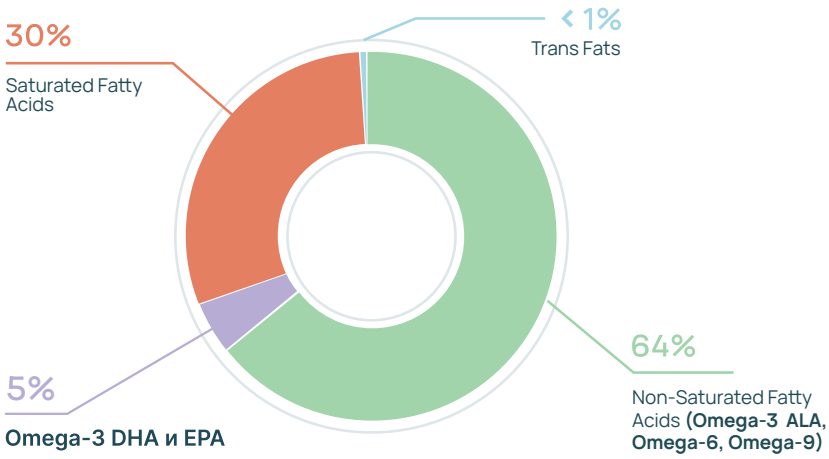
Fat intake

Dietary recommendations for adult men and women are to obtain up to 35% of their calorie demands through fats. For a person taking 2,000 calories a day this is about 78 grams of fats a day distributed in a balanced ratio as follows:

- **Between 45 to 50 g** (60 to 65% of total fat intake) is recommended to be obtained from nutritional sources that are rich in polyunsaturated (Omega-3 ALA, Omega-6) and monounsaturated (Omega-9) fatty acids in their natural form that have not been exposed to chemical or high-heat processing.
- Such sources of healthy fats are: most nuts (walnut, almond, macadamia, pecan, peanut, pumpkin seeds), chia, olives, avocado, fish, cold-pressed oils such as cooking oil, olive oil, rapeseed oil, etc.
- The recommended daily intake of Omega-3 DHA and EPA is 1,000 to 4,000 mg/d **(2 to 5% of total fat intake)** and is associated with reduction in inflammatory reactions, normalization of blood pressure and improvement of cholesterol levels and lipid profile. Plant-based Omega-3 fatty acids (ALA) have significantly lower helpful biological activity and cannot replace the healthy effects of marine-derived Omega-3 fatty acids. Good nutritional sources of Omega-3 EPA/DHA are algae oil, fish oil, herring, wild salmon, tuna, mackerel, sardines, anchovies, lake trout.

When using Omega-3 supplements it is important to choose products containing high amounts of EPA and DHA (60 to 70%). In this way we can ensure intake of healthy fatty acids that is as pure and concentrated as possible.

- Intake of saturated fatty acids should not be completely avoided, but it is recommended to limit it to **25 to 30% of total fat intake** (20 to 23 g/d). The recommended upper limit for intake of saturated fat is up to 30 g/d for men and up to 20 g/d for women.
- Trans fats are entirely unhealthy because they cause strong inflammatory reactions in the body and are recommended to be avoided completely **(< 1% of total fats)**.



An easy way to distinguish among the different types of fatty acids is that due to differences in their chemical structure at room temperature saturated fatty acids turn solid (butter, lard), while unsaturated fatty acids are in liquid form (olive oil, cooking oil, fish oil). Trans fats are often vegetable oils that have undergone prolonged high-heat and/or chemical processing. They are present in margarine, snacks and crisps.

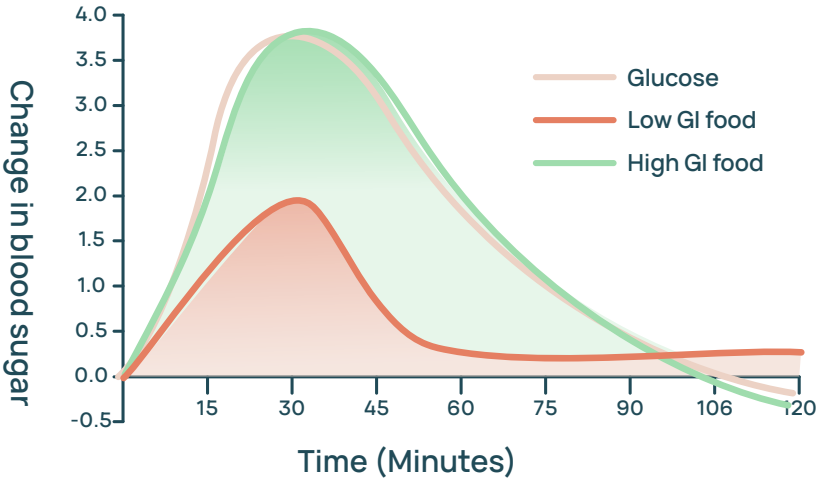
Important:

In some more sensitive people intake of capsules with high doses of Omega-3 EPA/DHA fatty acids (exceeding 1 g/d) in the fasting state may cause a slight laxative effect. If symptoms persist reduce intake of Omega-3 fatty acids according to individual sensitivity.
Carbohydrate intake.

Carbohydrate intake

The recommended carbohydrate intake for healthy adults is 45 to 65% of total daily energy intake. These should be obtained primarily through consumption of low glycemic index complex carbohydrates and restriction of high glycemic index simple carbohydrates. This type of diet leads to reduction in the development of insulin resistance, prediabetic conditions as well as other CNCDs.

Low glycemic index foods contain plant fiber, polyphenols and saponins and other healthy nutrients that do not cause a high insulin spike and provide the body with high amounts of vitamins and minerals. Such food products are: spinach, olives, cucumbers, brown and black rice, bulgur, quinoa, carrots, tomatoes, green beans, red lentils, mushrooms, zucchini, pumpkin seeds, asparagus, cabbage, raw nuts, whole grains of high fiber content, dark chocolate (containing more than 80% of cocoa), fresh low-sugar fruits such as blueberries, strawberries, blackberries, raspberries, apples, quince, pomegranate, etc.



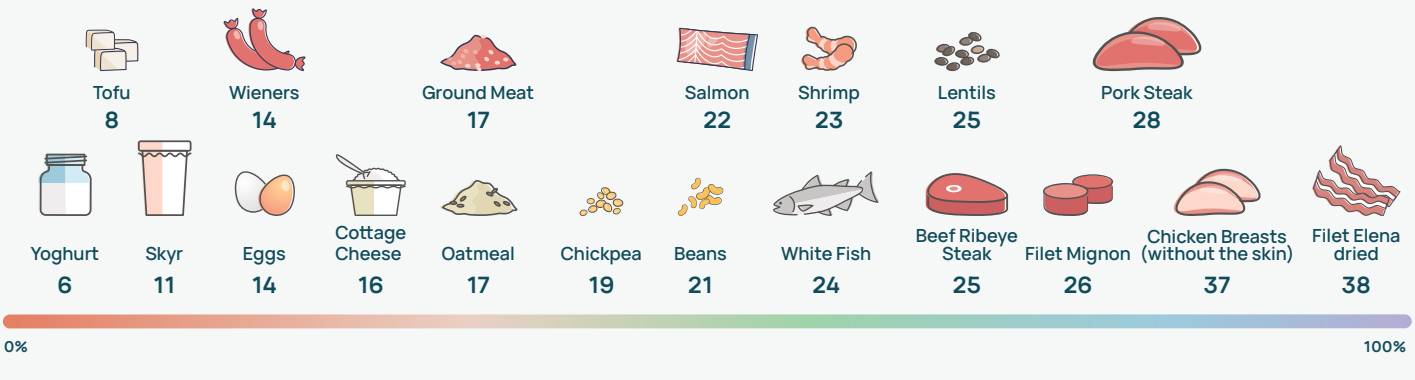
High glycemic index foods contain high absorption rate simple carbohydrates that cause a serum glucose spike and compensatory high insulin levels, respectively. Such food products are: white flour, white bread, sweets, jams, stewed fruits, honey, potatoes, granola, white rice, milk chocolate, pumpkin, white and brown sugar, high-sugar sweet fruits such as melon, watermelon, banana, pear, peach, etc

Protein intake

Protein intake in adults is recommended to be 10 to 35% of daily calorie demands or 0.6 to 0.8 g/kg. In people with increased physical activity protein intake may be as high as 1 to 1.5 g/kg depending on skeletal muscle demands.

There are no good or bad proteins – all ingested proteins are broken down in the stomach into some of the 20 nonessential and essential amino acids, di- and tripeptides. However, there are healthy and unhealthy nutritional protein sources.
Healthy sources are low-processed and natural foods with a high percentage of protein and lower content of other unhealthy food groups such as eggs, fish, beef, homegrown chicken fillet, turkey fillet, seafood, legumes, whole grains, cottage cheese, yogurt, skyr, etc.
Unhealthy protein sources introduce high amounts of unhealthy nutrients (mainly saturated fatty acids, salt, simple carbohydrates, etc.) into the body in addition to proteins. These include salted meats such as dry cold meats, pork, sausages, frankfurters, bacon, meatballs, etc.
Taking entirely plant-based protein (veganism) carries a risk of developing deficiencies of certain amino acids if done in an unbalanced way, as most plants do not contain all essential amino acids.

Amount of protein per 100g product



Stress and its relation to health

Types of stress

Stress is a common problem in developed societies. There are three main types of stress that may occur in our daily lives: acute stress (a short-term event, such as a heated argument or getting stuck in traffic); acute episodic stress (frequent acute events, such as work deadlines); and chronic stress (long-term events, such as job loss, physical or mental abuse, drug abuse or family conflict). Many of us may experience a combination of these three types of stress.

Our body responds to all types of stress through the same mechanism, which occurs regardless of whether the stress is caused by a real or imagined event. Both acute and chronic stressors trigger the fight-or-flight reaction. Hormones are released, which within a couple of seconds cause a rapid pumping of blood and oxygen to the cells, acceleration of heart rate and an increase in mental alertness. In prehistoric times this quick reaction was necessary to quickly escape a dangerous situation or ward off a predator. All types of stress may trigger this reaction described in more detail as follows:

- A small part of the brain called hypothalamus triggers the activation of the autonomic nervous system (ANS). The autonomic nervous system directs the functions of internal organs, over which we have no conscious control, such as changes in blood pressure, heart rate, breathing, digestion, etc. During the fight-or-flight reaction the ANS triggers the release of the hormone adrenaline from the adrenal glands.
- Adrenaline accelerates heart rate and increases blood pressure causing more blood and oxygen to circulate to the muscles and heart leading to a rush of energy, sharpening of hearing and vision, increased attention and high reactivity.
- If the stress continues the adrenal glands release another hormone called cortisol, which stimulates the release of glucose into the blood and increases the brain's use of glucose for energy. Some secondary systems in the body are suppressed, such as digestion, reproduction and growth to allow the body to focus on the source of stress.
- These hormones do not go back to normal levels until the stress is gone. If the stress does not go and becomes chronic the autonomic nervous system continues to trigger physical reactions that may lead to prolonged inflammation, oxidative stress and cell damage in the body.

In acute stress the event is short-term, hormone levels gradually go back to normal and no significant physical or mental problems are induced. However, frequent episodic or chronic stress repeatedly triggers the fight-or-flight reaction, resulting in a steady increase in stress hormones and a risk of developing the following health problems (20):

- **Digestive problems (heartburn, flatulence, diarrhea, constipation)**
- **Weight gain**
- **Increased blood pressure**
- **Chest pain, heart diseases**
- **Immune system problems**
- **Skin diseases**
- **Muscle pain** (headache, back pain, neck pain)
- **Sleep disorders, insomnia**
- **Infertility**
- **Anxiety, depression**

Eustress and distress

We often use the term stress to describe negative experiences or situations. This leads many people to believe that all stress is unhealthy, which is not always true. Stress is an inevitable part of life and can be both healthy and unhealthy. Understanding the differences between the types of stress is crucial to making sure you are coping with it in an informed and healthy way.

Stress is divided into two different forms depending on a person's perception and the emotions it causes, eustress and distress.

Eustress, sometimes called good stress, is actually acute short-term stress that can be good for the body. It motivates and mobilizes people to take action, fuels ambition and helps reach goals. It is short-term, is perceived as being within our coping abilities, generates excitement and improves concentration and performance (for example when taking an exam or speaking in public).

Distress is the unhealthy form of stress that is perceived as being beyond our coping abilities, usually represents frequent acute episodic or chronic stress, causes unpleasant emotions of worry and anxiety, reduces performance and concentration, leads to mental exhaustion and physical problems such as depression, fatigue, insomnia, etc. (e.g. death of a loved one, divorce, illness, etc.)

How does distress affect eating habits?

Distress leads to increased body demands for more oxygen, energy and nutrients, lack of motivation or time to prepare nutritious and balanced meals. It causes a change in eating rhythm often representing unhealthy fasting during the day and overeating in the evening.

Individuals experiencing distress may resort to increased consumption of easily accessible and comforting foods, representing a quick source of dopamine. These are most often high-calorie processed foods rich in simple carbohydrates, fats, salt and added sugar and poor in nutrients – snacks, crisps, sandwiches, sweets, chocolates, cold meats, French fries, breaded foods, alcohol, etc.

Stress can disrupt sleep by causing lighter sleep or more frequent awakenings, leading to daytime fatigue. To cope with daytime fatigue, people often resort to stimulants to boost energy and concentration, such as caffeine and nicotine. Excessive caffeine and nicotine consumption, on the other hand, further deteriorates sleep quality and a vicious cycle is formed.

Chronic stress and poor quality sleep lead to a significant increase in cortisol levels, which causes an increase in the levels of the hormone ghrelin responsible for increasing appetite and feeling of hunger (especially for the said unhealthy nutritional sources) and suppressing the hormone leptin responsible for feeling of satiety.

Cortisol promotes accumulation of fat in the abdominal area, which is associated with insulin resistance and increased risk of type 2 diabetes, cardiovascular diseases and certain cancers.

Recommendations to cope with stress

Healthy diet
A good, balanced and varied diet ensures all necessary nutrients, vitamins, minerals and energy the body needs to cope with stressful events. Studies show that diets rich in Omega-3 polyunsaturated fats and vegetables, similar to the Mediterranean diet, can help regulate cortisol levels.

Regular exercise
Physical activity helps lower blood pressure and stress hormone levels. Aerobic exercises, such as walking, running, cycling, dancing, and weight-bearing strength exercises, increase breathing and heart rate so that more oxygen can reach the cells throughout the body. This improves muscle and heart function, triggers the release of endorphins and reduces tension.

WHO recommendations on healthy levels of physical activity for adults over 18 years old are to have 150 to 300 minutes of moderate-intensity aerobic physical activity a week or 75 to 150 minutes of high-intensity aerobic physical activity a week, spread evenly across the days of the week.

Adding weight-bearing resistance exercises according to individual abilities that train the major muscle groups on 2 or more days of the week further contributes to health, muscle tone and building lean muscle mass.
Replacing time spent sitting with physical activity of any intensity (including light intensity or standing) has additional health benefits.

Meditation and deep breathing techniques
Rapid, shallow breathing and chaotic thoughts occur in response to stress.

Deep breathing and meditation techniques result in reduction in muscle tension, removal of carbon dioxide from the body, lowering of the heart rate and control over emotions by activating the parasympathetic nervous system.

Good balance between work and rest
Make the most of your time off and take time for yourself whenever you feel that stress is getting the better of you. Even when you can't take time off, you can get up earlier and set aside an hour a day in the morning before work to wake up, have breakfast, meditate or exercise in peace. In this way you can take care of yourself every day without rushing and without worrying about work or personal commitments.

Escaping from work pressure at regular intervals can do wonders for reducing stress, increasing productivity and reducing the risk of physical and mental diseases that are associated with workplace burnout.

Good sleep hygiene
Stress may lead to difficulty falling asleep as well as frequent interruptions of deep sleep at night, which can leave you tired the next day.

Aim to establish a healthy circadian rhythm by falling asleep at the same time every night and getting up at the same time every morning. Try to get 7 to 9 hours of uninterrupted sleep every night by avoiding exposure to screens, alcohol consumption, simple carbohydrates, nicotine and caffeine in the hours before bedtime. Getting 10 to 15 minutes of direct sunlight in the morning immediately after waking up helps normalize your biological clock by reducing the levels of the sleep hormone melatonin and helps you wake up quickly and feel refreshed and energized.

Deficiencies in an unbalanced diet

Nutritional deficiencies – macronutrients.

Practicing an unbalanced diet following the Western dietary pattern is associated with an imbalance in the intake of macronutrients and healthy nutrients, the main ones being:

Low intake of fiber, polysaccharides, alkaloids, saponins, polyphenols and other nutrients of plant origin

A deficiency of healthy nutrients such as fiber, polysaccharides, alkaloids, saponins, polyphenols and other molecules occurs as a consequence of reduced consumption of a variety of fruits and vegetables, legumes, raw nuts and whole grains.

Fiber

Fiber, unlike other food components such as fats, proteins or carbohydrates, is not absorbed by your body. Instead, it passes relatively intact through your stomach, small intestine and colon and out of your body. It is divided into soluble and insoluble fiber. Soluble fiber dissolves in water and forms a gel-like substance that helps lower blood cholesterol and glucose levels. Soluble fiber is found in oats, peas, beans, apples, citrus fruits, carrots, barley, etc.

Insoluble fiber

This type of fiber aids the movement of substances through the gastrointestinal system and increases the amount of bowel movements, so it can be helpful for people who suffer from constipation. Wholegrain flour, wheat bran, nuts, beans and vegetables such as cauliflower, green beans and potatoes are good sources of insoluble fiber.

The amount of soluble and insoluble fiber varies from one plant food to another. To get the greatest health benefit, consume a wide variety of high-fiber foods.

A diet high in soluble and insoluble fiber (20 to 30 grams a day) has numerous health effects on the body such as:

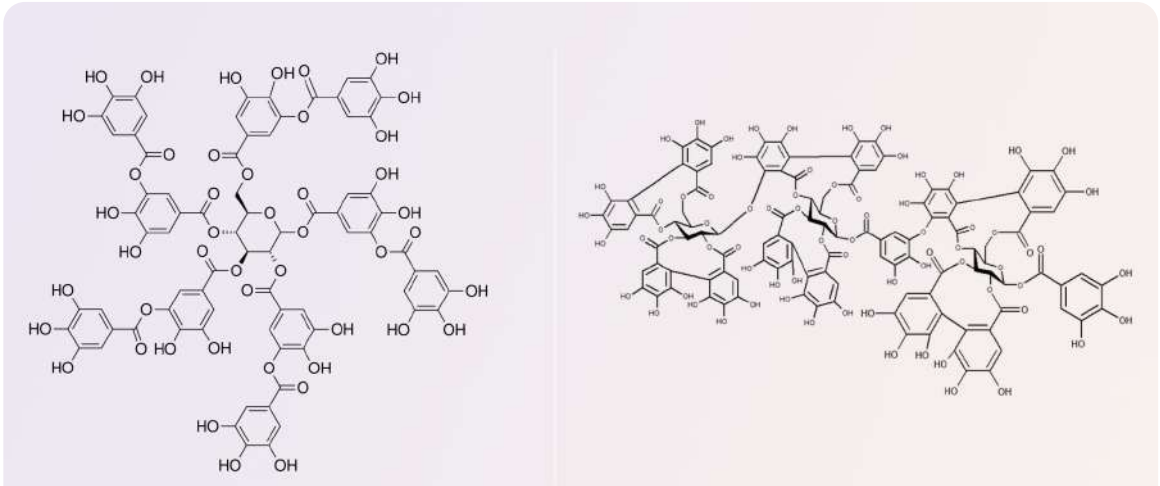
- Improved intestinal motility.
- Reduction in the risk of developing hemorrhoids and intestinal diverticula
- Reduction in bad cholesterol levels.
- Reduction in the risk of type 2 diabetes with improvement in the levels of blood sugar by slowing its absorption by the intestines.
- Increase in the feeling of satiety, thereby contributing to reaching a healthy weight.

Polyphenols

Polyphenols are a category of substances that are naturally found in plant foods, such as fruits, vegetables, herbs, spices, tea, dark chocolate and wine.

Polyphenols (derived from the Greek word polos meaning many) are a large family of naturally occurring organic molecules characterized by multiple phenolic groups.

Foods rich in polyphenols are fruits, vegetables, herbs, spices, tea, dark chocolate, wine, etc.



Chemical structure of garlic and raspberry polyphenols

Due to the presence of multiple phenolic groups polyphenols act as antioxidants, which means they can neutralize harmful free radicals that would otherwise damage your cells and increase the risk of developing multiple chronic noncommunicable diseases such as cancer, diabetes, heart diseases, etc. In addition to helping reduce oxidative stress and inflammation polyphenols accumulate in the gastrointestinal tract where they act as prebiotic food that nourishes and stimulates the development of a healthy gut microbiome. Polyphenols are divided into several main groups according to their structure:

Flavonoids

These make up about 60% of all polyphenols. Examples are quercetin, kaempferol, catechins and anthocyanins, which are found in foods such as apples, onions, dark chocolate and red cabbage.

Polyphenolic amides

This category includes capsaicinoids in chili peppers and avenanthramides in oats.

Phenolic acids

This group makes up about 30% of all polyphenols. Examples are ferulic and chlorogenic acids in coffee and cereals

Stilbenes

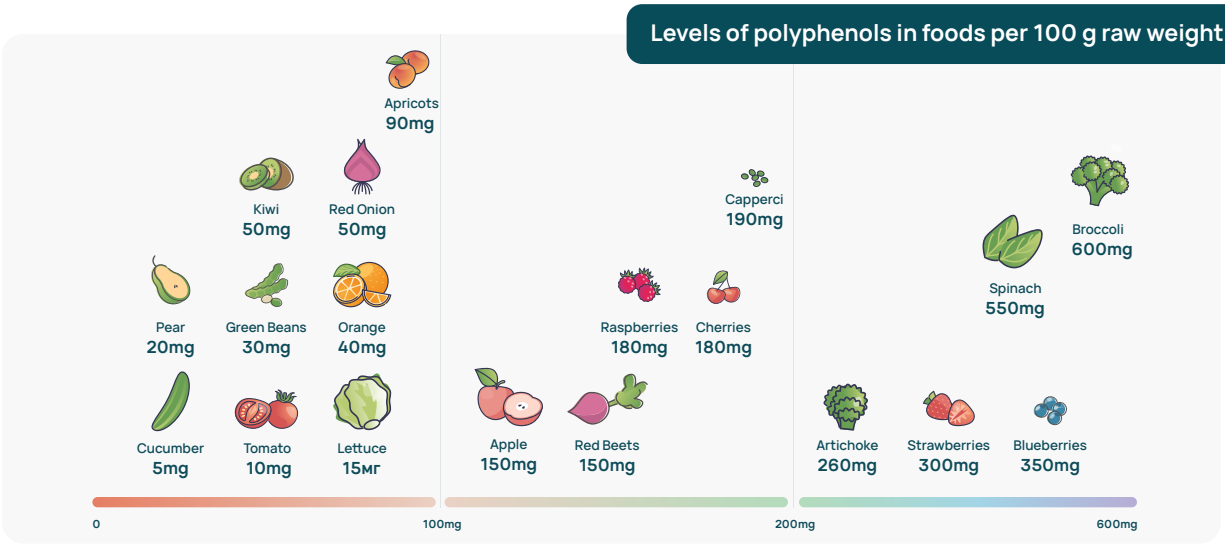
Found in grapes and berries, resveratrol in red wine, curcumin in turmeric, etc.

Lignans

Found in flaxseed, sesame and whole grains.

Low polyphenol intake below 600 mg/d as a result of an unhealthy diet is associated with a 37% increase in the risk of death from a CNCD compared to people with high daily polyphenol intake (>900 mg/d).

The average concentration of polyphenols may vary depending on factors such as variety, maturity level and cultivation method. The chart below shows the average concentration of some of the fruits and vegetables rich in polyphenols per 100 g of raw weight most commonly consumed in our daily lives:



Saponins

Saponins are naturally occurring glycoside compounds, part of the defense mechanisms of plants, which possess a number of biological properties, such as antimicrobial, antifungal, antiparasitic properties, etc. Saponins in plants are divided into 2 main groups – terpenoid and steroidal saponins.

The terpenoid saponins are found in many legumes (soybeans, chickpeas, beans, peanuts, broad beans, kidney beans and lentils), ginseng leaves, sunflower seeds, horse chestnut, licorice roots, spinach leaves, tea leaves, quinoa seeds, sugar beet, etc. Steroid saponins can be found in oats, tomato seeds, sweet potatoes, fenugreek seeds, ginseng roots, asparagus, eggplant, chili peppers, etc.

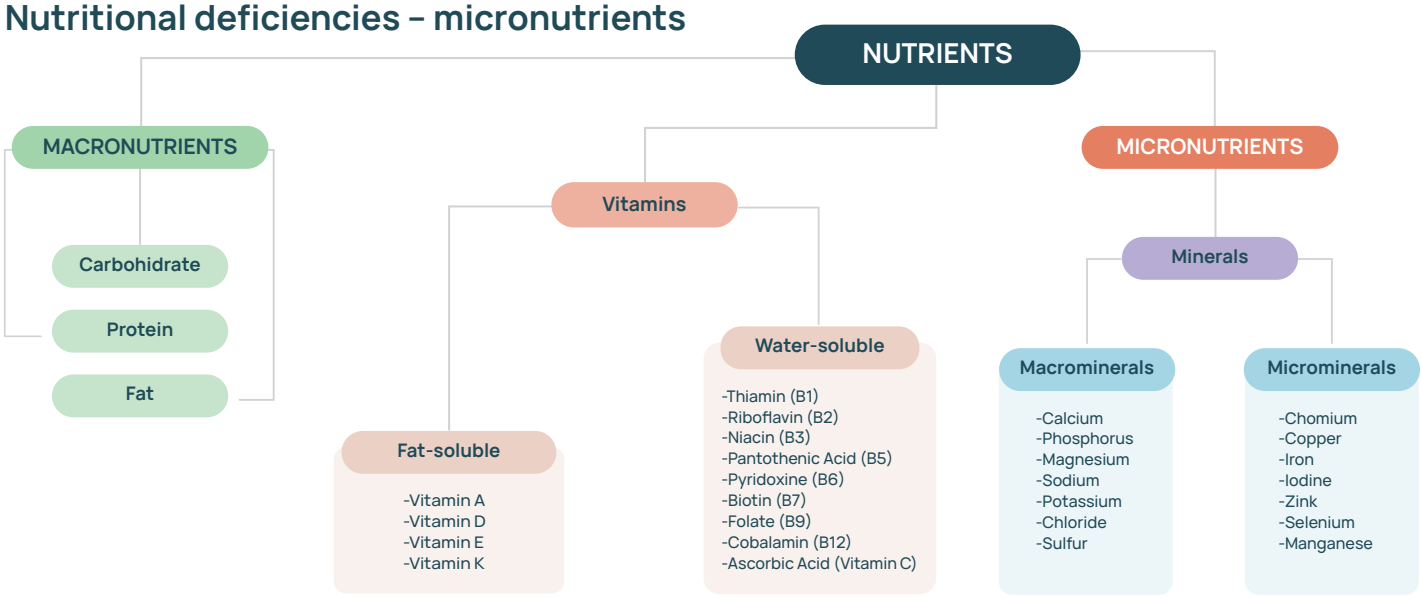
Used in the recommended daily amounts as food, saponins like polyphenols have a number of healthy effects on the body such as antioxidant, immunostimulant, hypocholesterolemic, hypoglycemic and anti-inflammatory effects that contribute to the prevention of multiple chronic diseases.

Low intake of fish and seafood rich in Omega-3 fatty acids

The Western diet is associated with consumption of high levels of saturated fatty acids (cow butter, animal fat, palm oil), Omega 6 and 9 fatty acids from refined oils such as cooking oil, corn oil, flaxseed oil, etc., increased consumption of trans fats (margarine, crisps, snacks, etc.) and low consumption of the healthy marine-derived Omega-3 fatty acids EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid), in extreme disproportionate ratios of 20 to 30:1.

Omega-3 EPA/DHA deficiency and disproportionate consumption of saturated and unsaturated fats is associated with the pathogenesis of many diseases, including cardiovascular diseases, cancer, inflammatory and autoimmune diseases.

Nutritional deficiencies – micronutrients

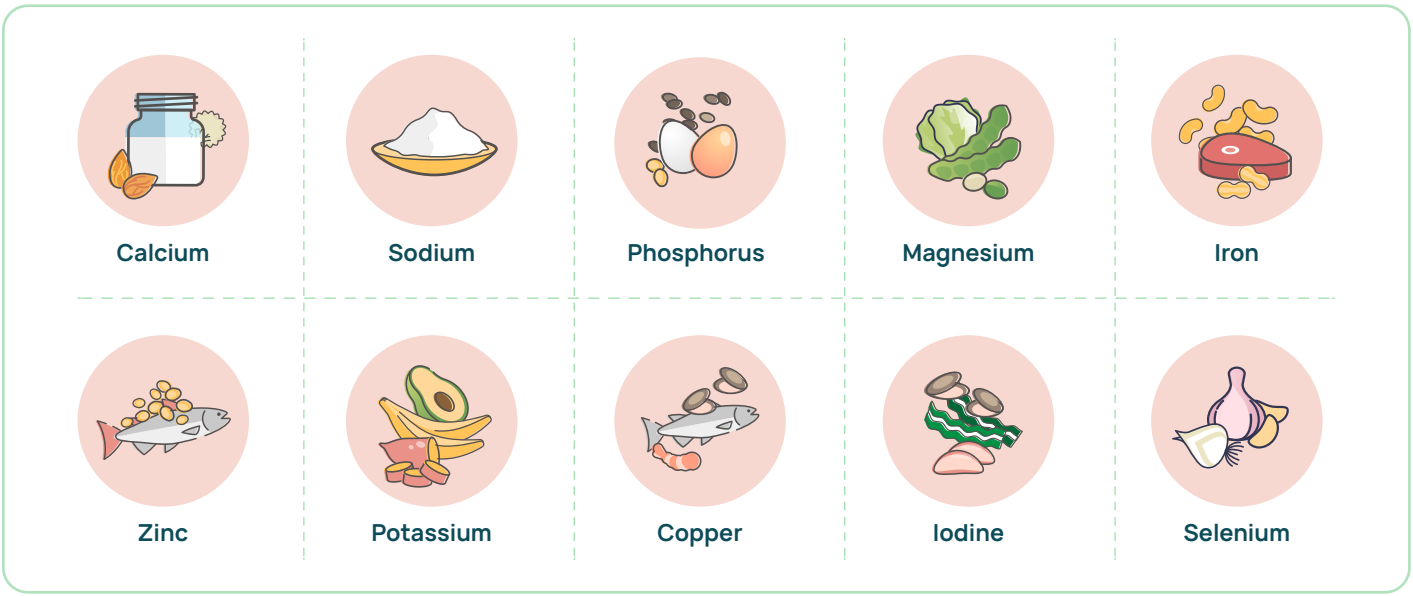


Micronutrients (vitamins and minerals) are essential nutrients that the human body needs in relatively small amounts unlike macronutrients (proteins, fats and carbohydrates). Vitamins and minerals are essential for the body's homeostasis and good health. They are important for good immune function, bone health, blood clotting, nerve function, wound healing, cell signaling, enzyme activation, hormone production and many other body processes.

A balanced diet, including a variety of fruits, vegetables, whole grains, lean proteins, dairy products, etc., ensures the adequate intake of necessary vitamins and minerals. The Western diet and the lack of dietary diversity is often the main cause of development of micronutrient deficiencies.

Minerals

The role of minerals in maintaining the health of the human body:



Calcium

Calcium is the most abundant mineral in the body and is best known for its role in maintaining healthy bones and teeth. It is also involved in muscle function, nerve signals, blood clotting and hormone secretion.

Sources: Dairy products, broccoli, almonds, sardines (with bones)

Phosphorus

Phosphorus works closely with calcium to build and maintain healthy bones and teeth. It is also essential for energy production, DNA synthesis and cell membrane structure.

Sources: Meat, fish, dairy products, eggs, lentils, nuts, brown rice, whole grains

Iron

Iron is crucial for the production of hemoglobin, the protein in red blood cells that carries oxygen throughout the body. It is also involved in energy production and immune function.

Sources: Molasses, red meat (beef, lamb, pork, liver), seafood (tuna, sardines, mussels, shrimp), legumes, nuts and seeds, whole grains

Sodium
Sodium is another electrolyte that helps regulate fluid balance and maintain proper nerve and muscle function.
It is important for maintaining blood pressure and pH balance in the body.

Източници: Salt

Potassium
Potassium is an electrolyte that helps maintain proper
fluid balance, nerve function and muscle contractions.
It also plays a role in maintaining a healthy heart rhythm and
blood pressure.

Sources: Bananas, sweet potatoes, spinach, avocado, watermelon, melon

Magnesium
Magnesium is involved in hundreds of biochemical reactions in the body. It plays a vital role in muscle and nerve function, energy production, DNA synthesis, bone health and blood pressure regulation.

Sources: Spinach, whole grains, legumes, nuts and seeds

Copper
Copper is important for red blood cell production, collagen synthesis, energy production and antioxidant protection. It also plays a role in brain development and function.

Sources: Seafood, mushrooms, liver, nuts and seeds

Zinc
Zinc is involved in multiple enzymatic reactions in the body and plays an important role in immune function, wound healing, DNA synthesis, growth and development.

Sources: Seafood, red meat, poultry, legumes, soy products

Iodine
Iodine is essential for the production of thyroid hormones that regulate metabolism, growth and development. It is particularly important for proper brain development during pregnancy and early childhood.

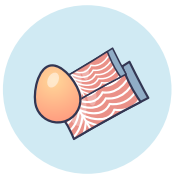
Sources: Seaweed, fish, seafood, iodized salt, eggs

Selenium
Selenium acts as an antioxidant and is involved in DNA synthesis, thyroid hormone metabolism and immune function. It also plays a role in fertility and reproductive health.

Sources: Brazil nuts, fish, seafood, meat, eggs, mushrooms, garlic and onions.

Vitamins
The role of vitamins in the maintenance of human health


Vitamin A


Vitamin D


Vitamin E


Vitamin K

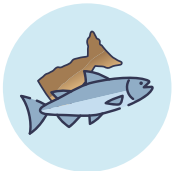

Vitamin C


Vitamin B1


Vitamin B2

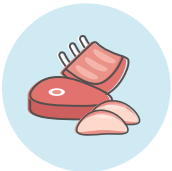

Vitamin B3


Vitamin B5


Vitamin B6


Vitamin B7


Vitamin B9


Vitamin B12

Vitamin A
Vitamin A is essential for maintaining healthy vision, boosting the immune system, reducing the risk of chronic diseases, healthy skin, reproductive health, healthy bones and teeth.

Sources: Eggs, dairy products, carrots, sweet potatoes, spinach, broccoli, lettuce

Vitamin E
Vitamin E is a strong antioxidant that reduces inflammatory reactions, reduces the risk of developing thromboses, is essential for good immune function, healthy skin and good vision.

Sources: Spinach, parsley, apricot, broccoli, avocado, mango, kiwi, almonds, hazelnuts, peanuts

Vitamin C
Vitamin C (ascorbic acid) is essential for boosting the immune system, wound healing, healthy skin and collagen production, cardiovascular health, iron absorption and protection of cells against oxidative stress.

Sources: Citrus fruits, strawberries, kiwi, cocoa and dark chocolate

Vitamin D
Vitamin D is essential for regulating calcium and phosphorus absorption, normal immune system function, bone and teeth growth and development, brain health, hormonal balance and regulation of inflammation.

Sources: Algae (spirulina and chlorella), mushrooms, eggs, fish and fish oils

Vitamin K
Vitamin K is important for bone metabolism and bone strengthening, improves cognitive (mental) abilities, is required for blood clotting and cardiovascular health. It has antioxidant properties important for reducing inflammatory processes.

Sources: Spinach, apricot, broccoli, lettuce, cauliflower, Brussels sprouts, parsley, green tea

Vitamin B1(thiamine)
Vitamin B1 (thiamine) plays an important role in the body for carbohydrate breakdown and glucose metabolism, energy (ATP) production, muscle and nerve cell function, heart function, cognitive processes, memory and concentration.

Sources: Rice, wheat grains and whole grains, raw almonds and walnuts

Vitamin B2 (riboflavin)
Vitamin B2 (riboflavin) helps the body break down food, absorb nutrients. It is involved in tissue maintenance, is required for the production of red blood cells and cell energy (ATP) and has anti-inflammatory properties.

Sources: Dairy products, eggs, broccoli, spinach, peas and asparagus, fish, beef, chicken and pork

Vitamin B3 (niacin)
Vitamin B3 (niacin) is a micronutrient required for the regulation of blood sugar levels and proper metabolism, nervous system function and protection of nerves against oxidative stress and degeneration. Improves skin and hair health, required for the regulation of bone density and mineralization processes.

Sources: Whole grain bread, whole grains, cereals, poultry, fish and seafood

Vitamin B12 (cobalamin)
Vitamin B12 (cobalamin) has an essential role in the production of red blood cells, DNA synthesis, nerve function, cell metabolism and energy (ATP) production.

Sources: Dairy products, eggs, fish and seafood, beef, pork, chicken, liver, nutritional yeast

Vitamin B5(pantothenic acid)
Vitamin B5 (pantothenic acid) is essential for the synthesis of coenzyme A (CoA) required for cell energy production. Contributes to skin wounds healing, healthy hair and eyes. Required for the proper nervous system, liver and gastrointestinal system function, is important for the production of red blood cells and the synthesis of sex hormones.

Sources: Mushrooms, fish and seafood, nuts and seeds, avocado, potatoes, corn, broccoli

Vitamin B6 (pyridoxine)
Vitamin B6 (pyridoxine) is an essential vitamin that plays an important role in the prevention and treatment of anemia, helps the production of red blood cells, is involved in the production of neurotransmitters (serotonin) and reduction of anxiety. It is important for brain development and function, heart health and good vision.

Sources: Bananas, oatmeal, fish and seafood, chicken and turkey, corn

Vitamin B7(biotin)
Vitamin B7 (biotin) is a water-soluble vitamin required for the growth and development of all cells.
It is essential for energy metabolism, fat, carbohydrate and protein breakdown.
It helps maintain a healthy nervous system, nails, hair and skin.

Sources: Whole grains, rice, eggs, fish and seafood

Vitamin B9 (folic acid)
Vitamin B9 (folic acid) is essential for DNA synthesis and
repair, cell growth and division, the production of red blood cells, proper nervous system and brain function.

Sources: Spinach, kale, broccoli, asparagus, Brussels sprouts, green beans, artichokes, oranges, tangerines, grapefruit, lemons, avocado, beans and lentils

Common vitamin and mineral deficiencies.

Any abnormal levels of both minerals and vitamins may lead to deregulation of the body's function, cause disorders in cell processes and dysfunction of tissues and organs, which may subsequently result in development of pathologic conditions. Therefore, early detection of abnormalities in concentration of macro- and micronutrients and vitamins in serum samples is a reliable indicator of human homeostasis. For some of the deficiencies developed a compensatory intake of dietary supplements is recommended after consulting a healthcare professional.

Vitamin D:
This is the most common deficiency among humans. It occurs in about 20% of the population in Northern Europe, 30 to 60% in Western, Southern and Eastern Europe and up to 80% in Middle Eastern countries. It develops as a consequence of limited exposure to sunlight due to working indoors, as a consequence of air pollution and excessive use of sunscreens. Some common symptoms of deficiency include fatigue, muscle weakness, bone pain, depression and impaired wound healing.

Iron:
Iron deficiency is widespread, especially among women of child-bearing potential due to blood loss during menstruation. Vegetarians and vegans may also be at higher risk of deficiency due to the lower bioavailability of iron in plant nutritional sources. Iron deficiency may manifest with development of anemia characterized by symptoms of weakness, pale skin, shortness of breath, dizziness, cold hands and feet, brittle nails and headache.

Calcium:
Insufficient calcium intake is common, especially among adolescents and the elderly. This may lead to bone-related problems such as reduction in bone density and fractures.

Vitamin B12:
This deficiency is more common among older adults and people with gastrointestinal disorders that affect the vitamin absorption, as well as those who follow a vegan diet since Vitamin B12 is found primarily in animal products. It may manifest with shortness of breath, headache, indigestion, loss of appetite, palpitations, vision problems, feeling weak or tired.

Iodine:
Although iodine deficiency is less common in Western countries due to the widespread use of iodized salt some population groups, such as pregnant women and people who avoid salt, may still be at risk. Symptoms of iodine deficiency include fatigue, weight gain, constipation, dry skin and hair loss. Severe iodine deficiency may lead to goiter, hypothyroidism and cognitive disorders.

Vitamin B9 (folic acid):
Folic acid deficiency is a cause for concern, especially among pregnant women, as it plays a crucial role in proper fetal development. Approximately 30 to 50% of the human population carries at least one copy of the MTHFR gene mutation. This mutation may affect the body's ability to process Vitamin B9. In the presence of such a mutation it is recommended to take methylated folic acid to correct its deficiency.

Symptoms the deficiency may manifest with are cognitive disorders such as memory loss, confusion, depression, fatigue, weakness, pale skin and a drop in hemoglobin. Gastrointestinal problems such as diarrhea, loss of appetite, weight loss, mouth ulcers, tongue swelling and changes in taste perception.

Magnesium:
Magnesium deficiency may be due to poor diet, certain medical conditions or the use of certain drugs. It often manifests with symptoms such as muscle cramps, fatigue and irregular heartbeat, etc.

Vitamin A:
Although less common in developed countries, Vitamin A deficiency may still occur, especially in low-income population or people with limited access to a variety of foods. This deficiency may lead to visual disorders and weakened immunity.

Vitamin C:
Although scurvy, the disease resulting from severe Vitamin C deficiency, is rare in developed countries, suboptimal Vitamin C intake is still relatively common. This may be due to insufficient consumption of fruits and vegetables, which are the main nutritional sources of Vitamin C. Symptoms of moderate Vitamin C deficiency may include fatigue, weakened immunity and slow wound healing.

Vitamin E:
Although Vitamin E deficiency is less common than some other micronutrients, Vitamin E intakes may be suboptimal in some population groups, such as in people with very low body fat or those who consume little nuts, seeds and vegetable oils. Symptoms of Vitamin E deficiency may include muscle weakness, vision problems and impaired immune function.

Gut microbiome

What is the role of the microbiome for health?

The microbiome in the small and large intestine is a consortium of trillions of microorganisms (also called microbiota) of thousands of different species. These include not only bacteria, but also fungi, protozoa and viruses. The microbiota is an extremely rich and dynamic ecosystem where important functions take place such as fermentation of fiber into short-chain fatty acids, protein and complex carbohydrate metabolism, vitamin synthesis and other important functions. Some authors even consider the microbiome an additional supporting organ in the body, which is crucial for reaching a healthy state of the body.

The microbiome coexists in balance with the host's body (symbiosis) and contributes to the proper gut function and homeostasis. Most of the microorganisms in the microbiome are symbiotic (helpful to the body), a smaller proportion are opportunistic (can harm the body if proliferate in large numbers) and a small proportion are pathogenic (harmful to the body). The healthy human microbiome contains multiple symbiotic strains such as bifidobacterium, lactobacillus, streptococcus, lactococcus, etc., which, in addition to playing important metabolic functions for the body, also produce antibacterial peptides that inhibit the development of pathogenic and opportunistic strains.

Environmental factors such as stress, infection, unhealthy eating habits, increased alcohol intake, continued use of antibiotics or other drugs may change the balance of the microbiome, destroy helpful bacteria and allow the proliferation of pathogenic and opportunistic strains.

The resulting imbalance in the microbiome ecosystem (dysbiosis) may cause digestive problems such as bloating, gas and diarrhea, a weakened immune system, increased risk of infections, gut inflammation, malabsorption of nutrients and mental health problems such as anxiety and depression.

How can we improve our gut microbiome?

Food plays a major role in determining the type of microbiota that lives in the colon. The high content of fiber, polyphenols and some saponins in the diet supplies the gut with a variety of molecules and substances nourishing the microbiome that actually have a prebiotic role, whereby development of helpful bacteria is potentiated.

Fiber is broken down by bacteria through fermentation, producing short-chain fatty acids such as acetate, propionate and butyrate. Short-chain fatty acids represent an important source of energy for colonic cells and play a role in regulating various physiological processes, including immune function and inflammation.

Polyphenols are metabolized through enzymatic reactions by bacteria, broken down into smaller molecules (postbiotics), and then absorbed by the body where they exhibit a range of biological activities such as antioxidant, anti-inflammatory and antimicrobial ones.

Some saponins, such as those found in ginseng, oats, soy, chestnuts, avocado and pumpkin seeds, act as prebiotics that selectively promote the growth and activity of helpful bacteria in the gut such as bifidobacteria and lactobacilli. Saponins have strong anti-inflammatory properties that protect the integrity of the gastrointestinal mucosa and prevent the transfer of harmful substances such as toxins and pathogens from the intestinal lumen into the bloodstream. This reduces the risk of systemic inflammation and infection.

Some of the best prebiotic foods are: yogurt, pickles, kefir, ginseng saponins, green tea polyphenols, artichoke inulin, etc.

Probiotics

Probiotic supplements may be a suitable source of helpful bacteria, but due to poor regulation low quality products are very often available and advertised in the open market. It is important to know that since probiotics contain live organisms more than half of the bacteria present in a product may die by the end of the first year of the date of manufacture. This process can be further accelerated by prolonged and improper storage of the probiotic.

It is necessary to select multistrain probiotics (10 to 15 strains) with the highest possible microbial count (at least between 5 to 10 billion per strain for most bacteria), thus ensuring intake of sufficient live microorganisms and good diversity in the microbiome ecosystem.

The presence of a prebiotic in a product contributes to the good development of helpful bacteria. The intake of probiotics needs to be with food in order for the bacteria to reach the intestine smoothly and not break down in the gastric juice.

Prima Sanitas dietary supplements

Inspired by the healthy effects of the Mediterranean diet Prima Sanitas dietary supplements are aimed to provide, in appropriate daily amounts, high-quality and proven healthy nutrients and bacteria that contribute to optimizing human healthy dietary diversity.

Prima Sanitas dietary supplements are originally designed to be used as a regimen by individuals with chronic conditions suffering from malnutrition, high levels of oxidative stress, inflammation, fatigue, gastrointestinal problems, immune system decline, dysbiosis, malnutrition and other adverse events arising as a result of their disease or the medical treatment administered.

Benefits of the use of appropriate dietary supplements are reported not only in people with chronic diseases. Administration of Prima Sanitas Regimen to healthy individuals along with dietary adjustment and exercise may assist in reaching a healthy nutritional balance, correction of nutritional deficiencies, enhanced recovery after exercise, mental resilience and a well-functioning gut microbiome. Improved body health is associated with quality of life improvement and incidence reduction of multiple chronic noncommunicable diseases.

Prima Sanitas products are also suitable for:

- **People experiencing chronic stress and chronic fatigue**
- **Athletes with high physical activity**
- **People with evidence of gastrointestinal dysbiosis**
- **People with evidence of immune system decline**
- **People with high levels of oxidative stress and inflammatory reactions**
- **People with unbalanced diets and nutritional deficiencies.**

Important:

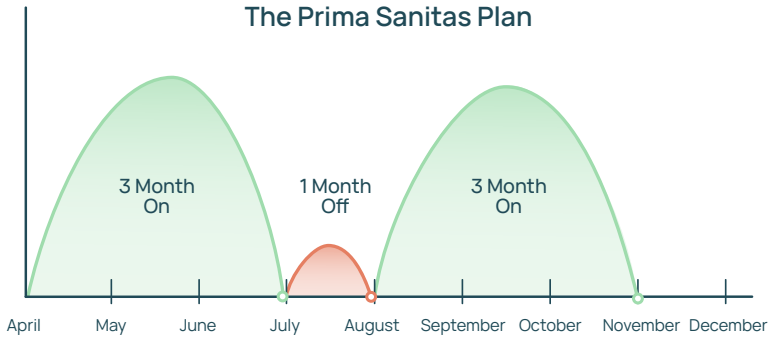
Consult your primary doctor before using Prima Sanitas dietary supplements in case you are taking prescribed drugs on a regular basis in order to evaluate drug interactions.

Recommended intake of Prima Sanitas Regimen

The regimen consists of a daily intake of the dietary supplements in the indicated doses:

- **Prima Sanitas Antioxidants:** 3 capsules/day
- **Prima Sanitas Omega-3 EPA/DHA:** 3 capsules/day
- **Prima Sanitas Protein/Glutamine:** 1 30-g scoop
- **Prima Sanitas Probiotic/Prebiotic:** 1 capsule/day

People without chronic diseases are recommended to have 1 month off at every 3 months of Prima Sanitas Regimen intake to avoid excessive accumulation of the substances in the body.



Prima Sanitas Antioxidants

Prima Sanitas Antioxidants contains highly concentrated plant extracts, vitamins and micronutrients that assist in reaching a high daily intake of dietary polyphenolic molecules and saponins.

The substances in the complex have a strong antioxidant effect and lead to reduction of oxidative stress and free radicals, improvement of gastrointestinal mucosa function, improvement of digestion and absorption processes, reduction of fatigue, prebiotic stimulation of gut microbiome, normal immune and nervous system function. Prima Sanitas Antioxidants works synergistically with the other Prima Sanitas Regimen products.

Prima Sanitas Omega-3 Oil

Prima Sanitas Omega-3 Oil contains a high 70% concentration of marine-derived essential Omega-3 fatty acids. It provides a high daily dose of 1,050 mg of EPA and DHA, which contributes to reaching a healthy ratio among Omega-3 and the other fatty acids in the body. An improved fat ratio is associated with normalization of inflammatory response, good vision, normal brain function, lipid profile improvement and beneficial effects on the cardiovascular system.

An all-natural product derived from pure algae grown in a controlled environment that contains no additional impurities from toxins and contaminants, therefore, its continued intake is considered safer compared to oils derived from ocean fish. Prima Sanitas Omega-3 Oil works synergistically with the other Prima Sanitas Regimen products.

IMPORTANT:
Take Prima Sanitas Omega-3 Oil immediately before or during meals. In some more sensitive people intake of high doses exceeding 1 g/d of Omega-3 EPA and DHA fatty acids in the fasting state may cause a slight laxative effect. In this case temporarily reduce intake to 2 or 1 capsule a day according to individual sensitivity.

Prima Sanitas Probiotic + prebiotic

Prima Sanitas Probiotic + Prebiotic contains 200 billion helpful bacteria, a combination of 15 different strains of the Lactobacillus, Bifidobacterium, Lactoccocus and Streptococcus families with a prebiotic. Prima Sanitas multistrain probiotic with a high microbial count contributes to lactose absorption and reaching a healthy and diverse gut microbiome, which is associated with normal immune system function, normal digestion and absorption processes, normal gastrointestinal mucosa function, reduction of gastrointestinal inflammatory reactions, reduction of pathogenic bacteria proliferation. Prima Sanitas Probiotic + Prebiotic works synergistically with the other Prima Sanitas Regimen products.

Prima Sanitas Protein and Glutamine + electrolytes

Prima Sanitas Protein and Glutamine + electrolytes is a balanced combination of isolated whey protein, the most common amino acid L-Glutamine and the essential electrolytes potassium, sodium and magnesium.

Suitable for athletes with increased physical activity. The combination contributes to the maintenance of normal gastrointestinal mucosa function, normal immune system function, restoration and maintenance of normal muscle function, preservation of lean muscle mass and effective activation of anabolic processes in skeletal muscles. Prima Sanitas Protein and Glutamine + electrolytes works synergistically with the other Prima Sanitas Regimen products.