Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools)
Project Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Nutrients
# Lesson 1

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INNOVATIVE STEPS

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INNOVATIVE STEPS

# 01

# Nutrients

Food - Nutritious food - Nutrients - Digestive tract

# What is food - are you familiar with the terms?

## Food

**Nutrition starts with:** food and eating

**When we eat,** food, consisting of various items**, enters the body.**

Image credit: Freepik.com

## Nutrients

**Foods contain essential substances:**

nutrients: proteins, carbohydrates, fats

**Nutrients are split into smaller nutrients in the digestive tract:**

— these are absorbed from the GIT into the bloodstream and reach all organs and tissues of the human body

**Nutrients provide cells with energy (calories) and nutrients:**

— necessary for growth, development, formation of own cells and tissues

— for many other functions essential for human life

# What is food?

**Food (diet) provides nourishment to the body,**
– and therefore it is one of the **BASIC CONDITIONS FOR** HUMAN **LIFE**.

**The diet consists of a large variety of food and drinks,**
– man receives food **BY EATING**.

**Consumption of food (foods, drinks):**
– **MEETS THE NEEDS** and demands of the body:
for energy, growth, development, formation and repair of body organs and tissues, regulation and protection of the organism.

**Eating the right foods and drinks,**
– to ensure a **NUTRITIONAL AND FULL SUPPLY of all** necessary **nutrients** and
– adequate **ENERGY** intake,
– will ensure **GOOD NUTRITION** and **SUPPORT the HEALTH** of every person for life.


Image credit: Freepik.com

# Function and food intake goals

Image credit: Freepik.com

- **The function and purpose of food intake is:**
  ⟫ **support the body** and **mentalphillic functions of** the body.
- **Food is composed of a wide range of foods,**
  ⟫ E**ach food** has a precisely **defined nutrient composition**.
- **Food and nutrition provide:**
  ⟫ **growth and development of** children and adolescents,
  ⟫ promote the **building and repair of** body cells and structures,
  ⟫ help **maintain the functioning of** organs and the body.

# Nutrition

- **Nutrition** represents the set of biochemical and physiological processes of substances that an organism receives and uses from the external environment, essential for life.

- **Biologically valuable nutrition** should cover the physiological needs of a person, in proportion to his needs with regard to age, sex, type of work performed.

- **During childhood and adolescence,** nutrition must ensure not only adequate weight and height gains, but also sexual maturation and completion of internal systems.

- **Healthy diets** should be hygienically safe and epidemiologically safe and meet the requirements of chronic disease prevention.

# The importance and utilisation of nutritional components

## Importance and use of nutrition:

**The importance of nutrition for humans**

- building, restoring and repairing cells, tissues and organs
- energy (work, movement, transport, digestion, and other functions)
- physical growth and development (intrauterine development, childhood, adolescence)
- mental and psychological activities
- immunity and inflammation
- regulatory and signal functions
- Hormonal and endocrine function
- reproduction
- haemopoiesis and haemostasis
- digestion - digestion and absorption
- breathing - respiration
- excretion - excretion
- wound healing

# What is a balanced and complete diet?

## The diet is refined and wholesome:

- if when **consumed regularly**,
- provides the consumer with **all the necessary nutrients in the right amount**.

- it can make people feel and look their best.

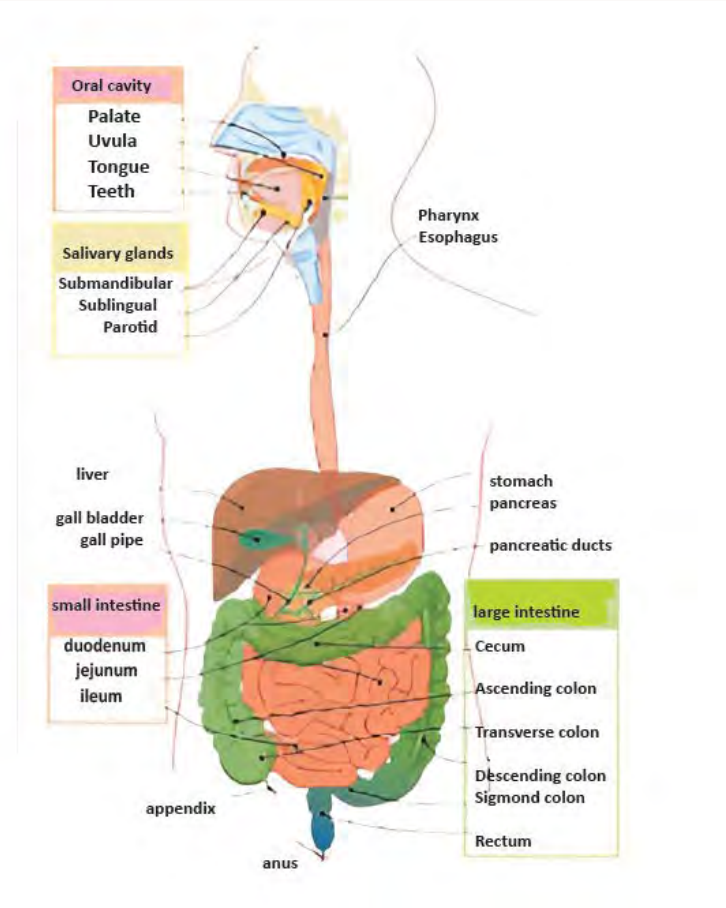
- maintains **energy** and **health**,
- **precursor to** a serious **chronic disease**, namely:
- in the **near** as well as **distant future** (later in life).

Image credit: Freepik.com

Food is one of the basic conditions of human existence, similar to water or air - oxygen. The function of food intake is to supply energy and nutrients, and to provide comprehensive support for the physical and mental functions of the body. Food consists of a whole spectrum of foods, each of which has a precisely defined composition of nutrients.

# Remember!

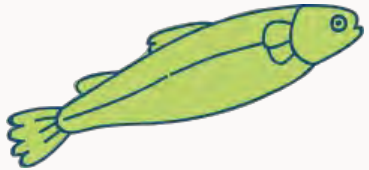
# Digestive tract




## Digestive tract - gastrointestinal tract - GIT

- **The digestive tract is used for**:
  - INTAKE AND DIGESTION OF FOOD
  - absorption of nutrients into the bloodstream
  - excretion of non-absorbable waste

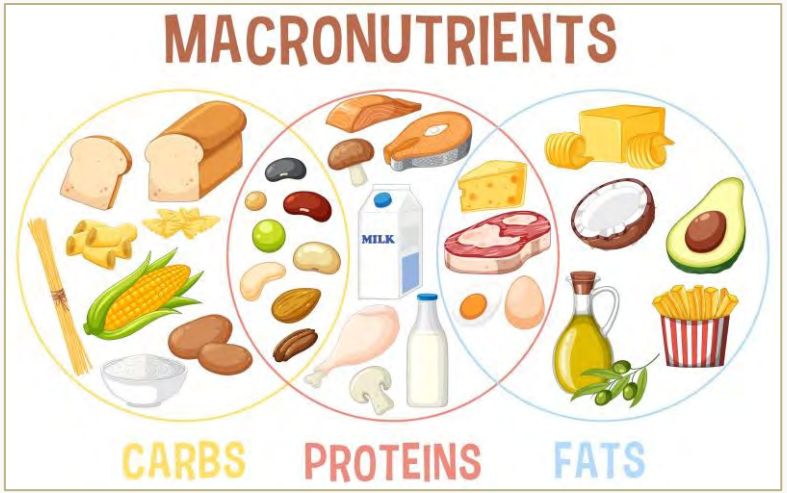
- **The digestive tract is starting:**
  - WITH oral cavity, continues through the esophagus, stomach and duodenum: upper digestive tract
  - continues through the other parts of the small intestine, the large intestine and ends with the rectum and the anus: lower digestive tract



## MACRONUTRIENTS - MACRONUTRIENTS:

**are essential nutrients in food** and include:

- PROTEINS
- SACHARIDS
- FATS




**ENERGY**: These NUTRIENTS PROVIDE A HUMAN WITH **energy - CALORIES**. Body DOES NOT USE THEM JUST AS **THE source OF POWER**

**GROWTH AND DEVELOPMENT**: the BODY needs NUTRIENTS FOR both **growth** and **development** (IN CHILDHOOD and AS adult TOO

**METABOLISM - SUBSTANCE EXCHANGE**: For **cell renewal** and tISSUES, **metabolism**

**HORMONES, ENZYMES, BLOOD CLOTTING, WOUND HEALING**:

for the production of important substances with various physiological functions.

We consume basic macronutrients daily in relatively large quantities and their daily intake is given in **grams.**

## MICRONUTRIENTS:

**are other "minor" but important nutrients in food**:

- VITAMINES/V
- MINERALS/ML
- TRACE ELEMENTS/TP
- PHYTOCHEMICALS/FCH - PLANT NUTRIENTS, ANTIOXIDANTS

**ESSENTIAL MICRONUTRIENTS**: this group includes very important nutrients, many of which are **essential for human life (V, ML, TP)**

**NON-ESSENTIAL MICRONUTRIENTS**: these are other **biologically active substances**, which are not essential, but s**ignificantly support the health** of consumers. The most important source of micronutrients is **plant foods (phytonutrients)**, not only vegetables and fruits, but also **whole grains** (whole grain bread, pastries, pasta and rice), as well as l**egumes, nuts and plant seeds**. Many valuable micronutrients are also contained in **animal foods** (meat, poultry, fish, milk, dairy products and eggs).
We consume micronutrients in our daily diet only **in very small quantities** and their daily intake is usually given in **milligrams.**

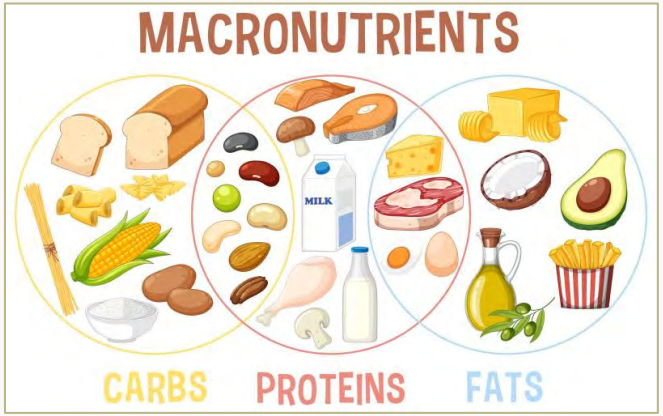



Image credit: Freepik.com

# WATER:

- Water does not contain **any energy** and is not a nutrient in the true sense of the word.

- However, water is **absolutely essential for human life.** Without water, life does not exist. **50-70%** of a person's total body weight is made up of water.

- **The proportion of water** in a person's total weight depends primarily on **age.**

- **In childhood**, the proportion of water in the body is highest and gradually decreases with age.

- We mainly consume water as part of our **drinking regimen** in the form of **liquids and drinks.**

- However, f**resh vegetables and fruits**, as well as **milk or soups**, are also rich sources of water.

Image credit: Freepik.com

# 02

# ProteinS

# PROTEINS

- - Proteins are **essential nutrients.**
  - Proteins are essential for life. Without them, the functioning and structure of living cells is impossible.
  - Proteins are responsible for functions such as:
    - growth and repair
    - hormonal and enzymatic activity
    - antibody production
    - muscle formation

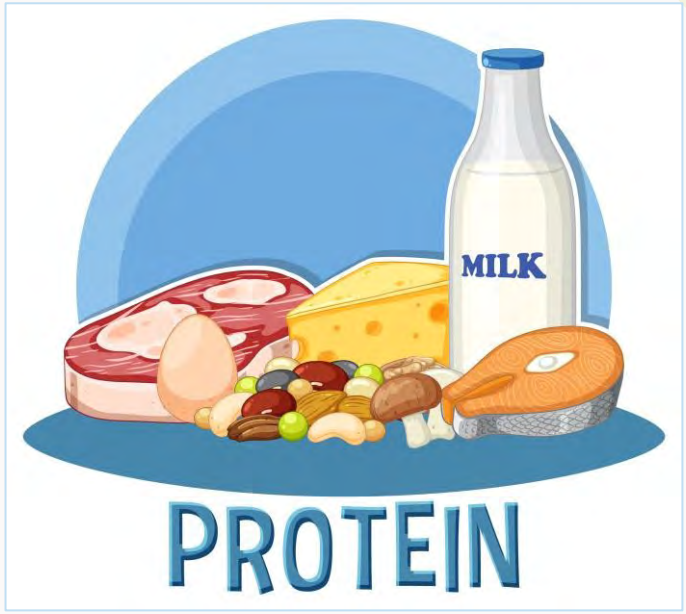



Image credit: Freepik.com

# PROTEINS

**Protein-rich foods are:**

- An important **source of energy**
- **Source of amino acids** (building blocks of proteins)
  - important for the production of our own proteins, (building blocks of proteins)
  - human cells can not produce all amino acids
- **Some amino acids can only be obtained by ingesting them from food** - **essential amino acids**
- **Almost all foods contain some amount of protein**, but thEiR QUANTITY AND QUALITY **varies**.

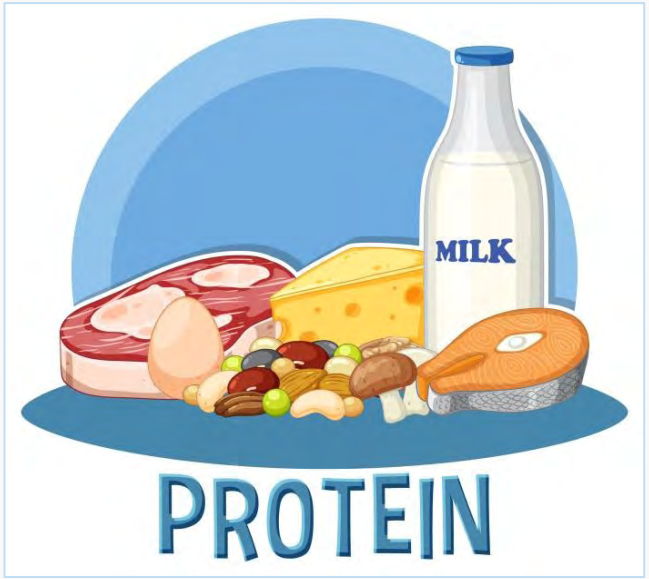



Image credit: Freepik.com

PROTEINS

# AMINO ACIDS

Proteins are made up of 20 different amino acids.

## Essential amino acids:

- Some amino acids that we get from protein in our food are irreplaceable for humans, because although people need them for their life, they cannot create them in their bodies from other substances.
- These amino acids must necessarily be supplied to the body from food.
- There are 9 essential amino acids in total.

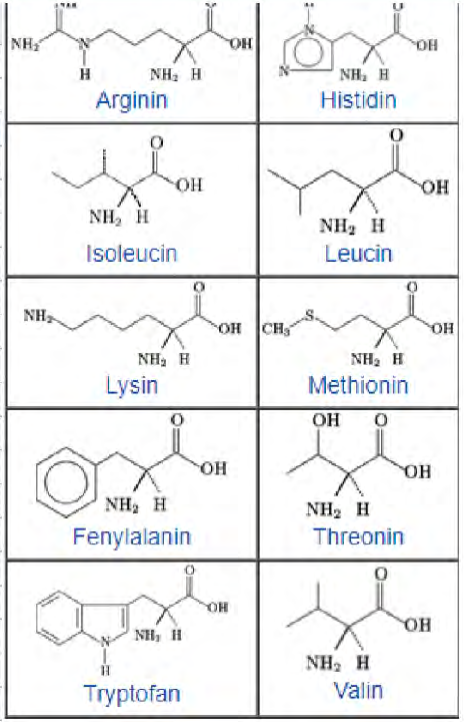
## Non-essential amino acids:

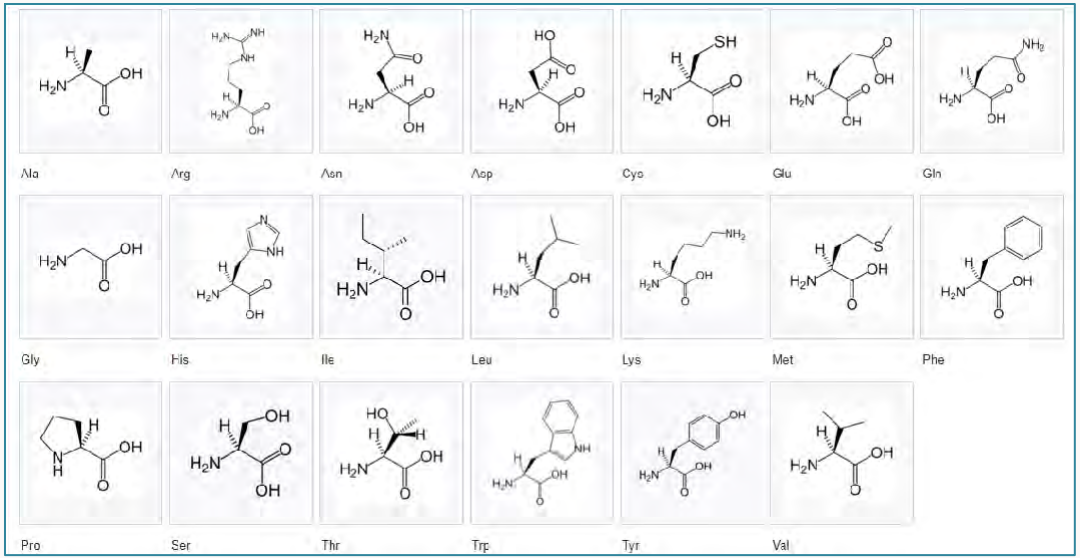
- Humans can also get other amino acids from protein in their food, but they can also create them from their own sources.
- Therefore, they are not necessarily dependent on their intake from food.

- There are 11 non-essential amino acids in total.

# Amino acids: the building blocks of protein

| Skr. | | Celý názov |
|---|---|---|
| A | Ala | Alanín |
| C | Cys | Cysteín |
| D | Asp | Kyselina asparágová |
| E | Glu | Kyselina glutámová |
| F | Phe | Fenylalanín |
| G | Gly | Glycín |
| H | His | Histidín |
| I | Ile | Izoleucín |
| K | Lys | Lyzín |
| L | Leu | Leucín |
| M | Met | Metionín |
| N | Asn | Asparagín |
| P | Pro | Prolín |
| Q | Gln | Glutamín |
| R | Arg | Arginín |
| S | Ser | Serín |
| T | Thr | Treonín |
| V | Val | Valín |
| W | Trp | Tryptofán |
| Y | Tyr | Tyrozín |




Chemical structure of 20 proteinogenic amino acids (source: Wikipedia, 2016)

Names and abbreviations of 20 proteinogenic amino acids. Essential and semi-essential amino acids (source: Wikipedia, 2016)

# PROTEINS

**According to their origin, proteins are divided into:**

- **animal** proteins
- **vegetable** bleach
- proteins from **algae**
- proteins from **non-traditional sources**


**According to the content of essential amino acids, proteins are divided into:**

- **Complete proteins** (complete, wholesome)
- **Incomplete proteins** (incomplete, incomplete)

# PROTEINS

Image credit: Freepik.com

## Complete, wholesome proteinS

- By complete proteins are meant proteins from SUCH SOURCES, which **contain adequate amounts of all the essential amino acids needed for life.**
- **The sources of** complete PROTEINS are ANIMAL **FOODS** (mEAT, POULTRY, FISH, EGGS, milk and DAIRY PRODUCTS

## Incomplete proteins

- They are FROM FOOD SOURCES, which **lack one or more essential amino acids** necessary for human beings and ANIMALS OR THEIR CONTENT IS UNSUFFICIENTLY LOW.

- **The source of INCOMPLETE PROTEINS** are also **plant foods** (CEREALS,NUTS, SEEDS, LEGUMES).
- **Most of the proteins derived from plant foods** are **incomplete proteins/except SOYA AND from quinoa.**
- **Incomplete proteins** can **be combined in a meal** to create complete proteins (e.g. by combining rice, bread, pastries or pasta with beans, lentils or any other legume). These foods do not need to be eaten at the same time for the body to use them to create its own proteins. It is enough to eat these complementary proteins within a 24-hour period.
- **By combining different sources of protein, plant-based diets can be a source of complete, wholesome protein**.

# Zapamätajte si!

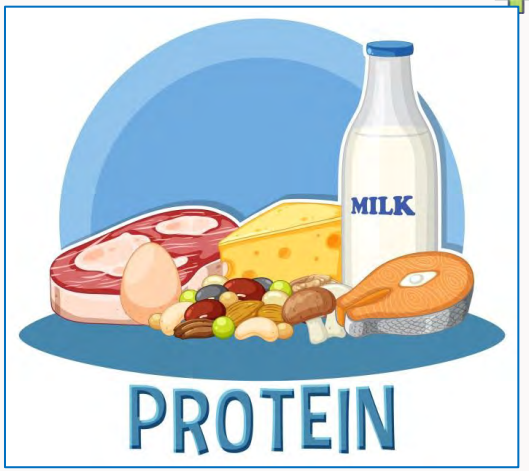
Príjem bielkovín v potrave v dostatočnom množstve je pre zdravie a život človeka nevyhnutný. Všetky potravinové zdroje bielkovín (živočíšne aj rastlinné potraviny) obsahujú 20 rozličných aminokyselín. Pomer jednotlivých aminokyselín je v rôznych potravinách odlišný.

9 z 20 aminokyselín musíme prijímať v potrave, lebo si ich naše telo nedokáže vytvoriť samo. Tieto aminokyseliny sa nazývajú **esenciálne aminokyseliny.**
11 z 20 aminokyselín, ktoré organizmus človeka taktiež potrebuje, si naše telo dokáže vyrobiť aj samo, takže ich príjem z potravy nie je nevyhnutný. Tieto aminokyseliny sa nazývajú **neesenciálne aminokyseliny.**

Pestrá a plnohodnotná strava, ktorá obsahuje potraviny živočíšneho aj rastlinného pôvodu, je zdrojom kompletných, plnohodnotných bielkovín s obsahom všetkých esenciálnych aj neesenciálnych aminokyselín.

Kompletnú zostavu všetkých esenciálnych aminokyselín však vieme získať aj konzumáciou rôznych rastlinných potravín obsahujúcich bielkoviny. Dobrými **rastlinnými zdrojmi bielkovín sú strukoviny (vrátane sóje, tofu a iných sójových výrobkov), obilniny, orechy a semienka rastlín.**

Kombinácia rastlinných zdrojov bielkovín (napríklad strukoviny + obilniny) poskytuje ľuďom, ktorí sa stravujú iba rastlinnou stravou (vegáni), všetky aminokyseliny vrátane esenciálnych. Okrem toho sú rastlinné potraviny väčšinou lacnejšie než živočíšne, navyše obsahujú menej tukov a kalórií ako mäso.
Sú preto dôležitým doplnkovým zdrojom bielkovín aj pre mnohých ľudí, ktorí konzumujú aj **živočíšne potraviny (mäso, hydinu, ryby, mlieko a mliečne výrobky).**





Images courtesy of Freepik.com

INNOVATIVE STEPS

# 03

# Carbohydrates

# CARBOHYDRATES

## The importance and distribution of carbohydrates

- Carbohydrates also belong to **essentials macronutrients** (proteins, carbohydrates, fats)
- In the past, the saccharides were called carbohydrates
- Saccharides from food serve as the **main and important source of ENERGY** for the body organs and all cells of our body. **Fats** and **proteins** are also another source of energy for the body.

**Energy is essential to the overall health and well-being of a person**, whether it comes from saccharides, fats or proteins.

- Saccharides belong into **basic constituents of plant and animal bodies** - including people - together with proteins and fats.
- **The proportion of carbohydrates in organic matter** is in **animal** and **plant** organisms quite **different**.
- — **animal dry mass** contains substantially **more protein and fat** than THE SACCHARIDES (THOSE OF only 2 %)
  — **plant dry mass** contains a substantial proportion of the saccharides (up to 90 %).

Saccharides according to their structure are divided into:

**SUGARS**

**STARCHES**

**FIBER**

# SUGARS - SIMPLE CARBOHYDRATES

## Sugars (simple sugars):

— **smaller molecules**, **simple structure**,

— are **soluble in** :ode,

— **taste sweet**.

## Sugars include:

- **grape sugar/glucose**,
- **fruit sugar/fructose**, mostly in: **fruits** and **vegetables**,
- **table sugar/saccharose**, with which we sweeten our food and which is obtained from **sugar beet** and **sugar cane**,
- **milk sugar/lactose**, which is added to the **milk** and dairies,
- **malt sugar/maltose**, which is in **grain**, in **cereal malt**.


Image credit: Freepik.com

# SUGARS - SIMPLE CARBOHYDRATES

In relation to nutrition and consumer health, sugars are divided into TOTAL, FREE and ADDED.

## Added sugars:

— are **all sugars** that are **added to foods and drinks** during their processing or preparation
—all added sugars **are also free sugars**.

## Free sugars:

— are **added sugars**,
— **and sugars** are found in **honey**, syrup, **fruit juices** and **fruit juice concentrates**.

## Total sugars:

— is the **total sugars content**
— these are **all sugars** found **in food and drink, regardless of their source**,
— include **added**, **free** and **naturally** occurring source of sugars that are in whole, uncut **fruits**, **vegetables** and sugar-free **milk**.


Image credit: Freepik.com

# Sugars: total - free - added


**Added sugars** are all sugars that are added to foods and drinks during their processing or preparation. All added sugars are also free sugars.

**Free sugars** include both added sugars and sugars naturally occurring in honey, syrups, fruit juices or fruit juice concentrates.

**Total sugars** are all sugars present in foods and drinks, regardless of their source. They include added, free and naturally occurring sources of sugars found in unripe or cut fruits, vegetables and unsweetened milk.

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# SUGARS AND HEALTHY NUTRITION

- **Adequate consumption of sugars: free sugars up to 10% of daily energy intake:** — has **no negative health effects of individual**
- **However, excessive intake of sugars increases the risk of tooth decay.**
- **Excessive consumption of sweetened beverages is associated with:** — with higher risk of obesity and diabetes of type 2.
- The results of studies in children and young people show that **the consumption of sugar-sweetened beverages in comparison with caloric - free (sugar free or sweetened by sweeteners,** may result in **weight gain, body mass index** (BMI) and the **development of obesity**.
- **Part of a healthy diet is limiting the intake of free sugars to:**
  - **less than 10 % of the TEI**:
  - in everyday diet it means, that daily intake of free sugars shouldnt exceed **50 g for women** or **60-75 g for men**.
- **Therefore, foods and beverages that contain mainly added sugars should be limited:**
  - e.g. sugar-sweetened soft drinks and dairy products,
  - cakes, biscuits, wafers, milk chocolates, pralines, jams, marmalades, etc..

TEI - Total Energy intake

# Basic facts and key links on the impact of diet and nutrition on health

World Health Organization

FACT SHEET N°394 — UPDATED AUGUST 2018

## Healthy diet

**KEY FACTS**

- A healthy diet helps to protect against malnutrition in all its forms, as well as noncommunicable diseases (NCDs) such as diabetes, heart disease, stroke and cancer.
- Unhealthy diet and lack of physical activity are leading global risks to health.
- Healthy dietary practices start early in life – breastfeeding fosters healthy growth and improves cognitive development, and may have longer term health benefits such as reducing the risk of becoming overweight or obese and developing NCDs later in life.
- Energy intake (calories) should be in balance with energy expenditure. To avoid unhealthy weight gain, total fat should not exceed 30% of total energy intake (1, 2, 3). Intake of saturated fats should be less than 10% of total energy intake, and intake of trans-fats less than 1% of total energy intake, with a shift in fat consumption away from saturated fats and trans-fats to unsaturated fats (3), and towards the goal of eliminating industrially-produced trans-fats (4, 5, 6).
- Limiting intake of free sugars to less than 10% of total energy intake (2, 7) is part of a healthy diet. A further reduction to less than 5% of total energy intake is suggested for additional health benefits (7).
- Keeping salt intake to less than 5 g per day (equivalent to sodium intake of less than 2 g per day) helps to prevent hypertension, and reduces the risk of heart disease and stroke in the adult population (8).
- WHO Member States have agreed to reduce the global population's intake of salt by 30% by 2025; they have also agreed to halt the rise in diabetes and obesity in adults and adolescents as well as in childhood overweight by 2025 (9, 10).

**OVERVIEW**

Consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms as well as a range of noncommunicable diseases (NCDs) and conditions. However, increased production of processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. People are now consuming more foods high in energy, fats, free sugars and salt/sodium, and many people do not eat enough fruit, vegetables and other dietary fibre such as whole grains.

The exact make-up of a diversified, balanced and healthy diet will vary depending on individual characteristics (e.g. age, gender, lifestyle and degree of physical activity), cultural context, locally available foods and dietary customs. However, the basic principles of what constitutes a healthy diet remain the same.

http://www.who.int/mediacentre/factsheets/fs394/en/

1

| | Key Nutrition Reference for Health | WHO Recommendation: |
|---|---|---|
| 1 | Fruits, vegetables, legumes, nuts and whole grains are part of a healthy diet. | |
| 2 | Amount of fruit and non-starchy vegetables consumed* | ≥400 g denne<br>≥porcii denne |
| 3 | Energy intake provided by free sugars | < 10 % z CEP |
| 4 | Energy intake from total fat<br>Energy intake from saturated fatty acids<br>Energy intake from trans fatty acids | < 30 % z CEP<br>< 10 % z CEP<br>< 1 % CEP |
| 5 | Daily intake of salt** | < 5 g |

World Health Organization, Fact Sheet No. 394. 2018

# STARCHES

## WHOLE GRAIN COMPOSITION

**A whole grain contains all three parts:**

- Bran: the fibrous outer layer
- Endosperm: the energy-rich middle part
- Sprouts: the nutrient-rich inner part

When grain is milled or refined, the bran and germ are removed. Only the endosperm remains.

When you eat whole grain foods, you are getting the nutritional value of the entire grain, including protective phytochemicals, vitamins, minerals, and fiber.

| | Carbohydrates (g) | Proteins (g) | Fats (g) | Fiber (g) | Iron (%DDD) | Vitamins & Others |
|---|---|---|---|---|---|---|
| **Bran** | 63 | 16 | 3 | 43 | 59 | Vitamin $B_5$ |
| **Endosperm** | 82 | 10 | 1.5 | 4 | 41 | |
| **Sprouts** | 52 | 23 | 10 | 14.5 | 35 | Vitamin $B_5$<br>Omega-3 FA<br>Omega-6 FA |

Source: Minárik, P., Mináriková, D.: Rakovina a výživa. Fakty a mýty. KONTAKT, 2013
Picture: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Redukčná diéta. Skúsme to inak, Dr. Josef Raabe Slovensko, 2021

# SHRUBS

**Starches are complex, larger and more complex carbohydrates:**

— have **larger molecules than sugars** and

— They consist of **large amounts of grape sugar/glucose**.

**Starches as opposed to sugars:**

— are **less soluble in water** than sugars and

— **have no sweet taste**.

**Starches are present in most plants:**

— and **plants** are used to **store energy**.

**Worldwide, starches are the most common carbohydrate in the human diet:**

— and **many staple foods contain them**,

— f.ex. **cereals** (bread, pasta), **maize**, **rice**, **potatoes** or **sweet potatoes** (tropical sweet potatoes).

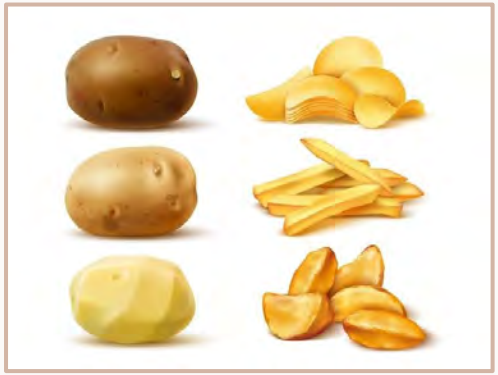


Image credit: Freepik.com

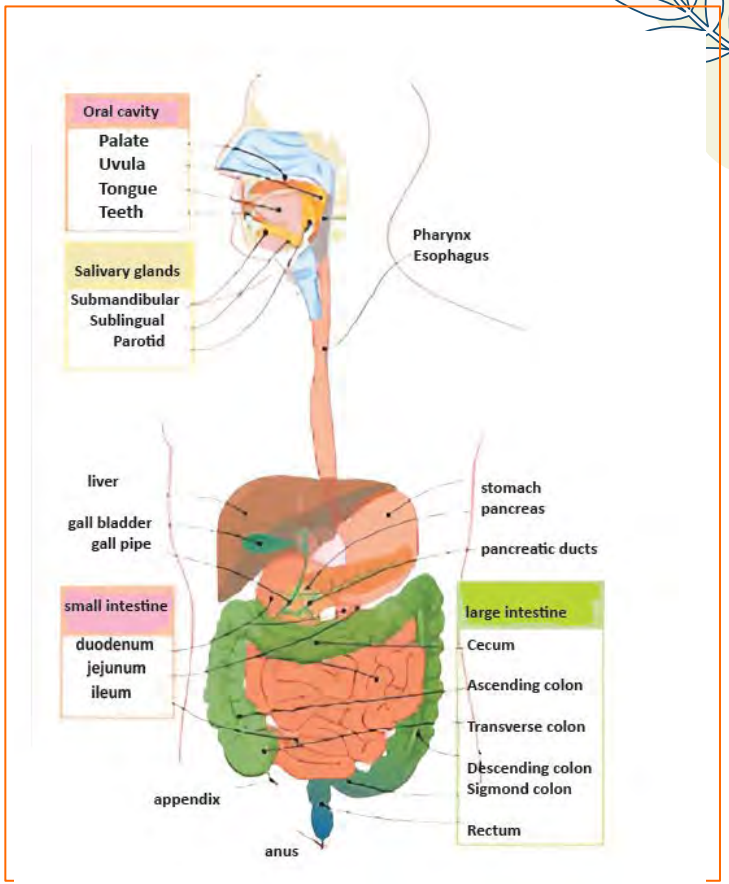
**After consuming starch-containing foods, the ingested starch is digested in the digestive tract:**

— and it **takes** the one and only sugar - **glucose**,

— which **is absorbed into the blood** and **spread** into the organism.

**Glucose is the main source of energy for the brain and nervous system, red blood cells.**

— Also muscles and other body cells can use glucose as the source of power



## Plant foods, of which starches are an essential component:

— they're called **starchy foods**.

## This group includes basic foods, which:

— are **added to protein foods** (meat, poultry, fish, legumes, eggs) as starchy **side dishes** (potatoes, rice, pasta, bread, pastry).

## These side dishes depending on the portion size consumed:

— create **significant added energy** (calories) of daily diet (breakfast, lunch, dinner).

## Starches and starchy foods (bread, pastry, pasta, rice, potatoes, corn)

— are first of all a **source of energy**

## There is no conclusive evidence of this:

— that **adequate consumption** would promote **weight gain** and **obesity**.

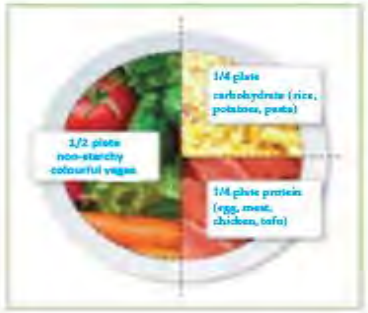
## For cereal-based foods, they priority should be given to:

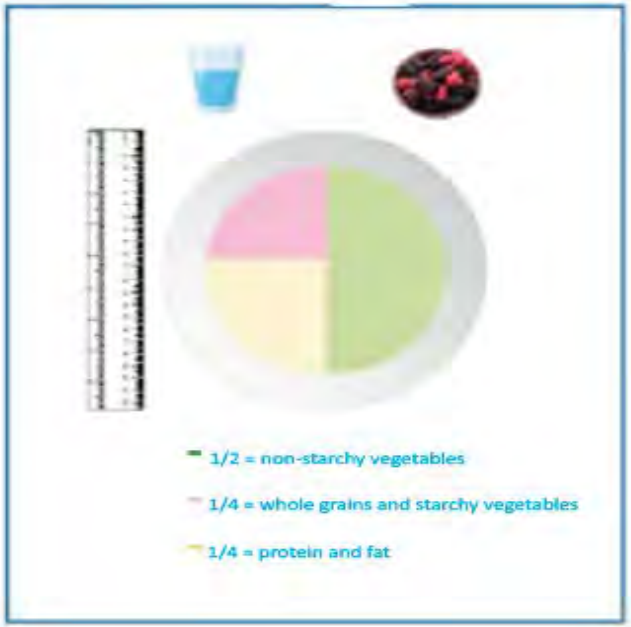
— **wholemeal products** containing fiber

— **from refined products** that contain only small amounts of fiber

**Starchy foods should cover ¼ of the "Healthy Plate".**

# Graphic representation of a *Properly loaded plate*, or a *Healthy plate* with the correct distribution of foods (various sources used)

# FIBER

## Definition of fiber

Dietary fibre consists of indigestible or only partially digestible components of plant foods.

Dietary fiber is a collection of various carbohydrates that are indigestible in the human digestive tract:

— and we find them **only in plant foods**:

— vegetable, fruits, bran cereals, whole grain cereals, whole grain bread, pasta, brown rice, potaties, legumes and plant seeds.

Image credit: Freepik.com

# Insoluble fibre

These type of fiber are **insoluble in water** and **metabolically** and chemically **inactive**.

- includes **CELULOSIS** and **LIGNIN**.

**Cellulose is the main substance found in:**

》 in the walls of all plant cells and help the plants to remain strong and have this solid existence.

In spite of the fact that **man cannot digest cellulose ingested from plant food**,

》 it has the **beneficial effects on health**.

**The cellulose** remains **undigested in the digestive tract,**

》 **increases the volume of digested food and stool** and **promotes intestinal peristalsis, thus** contributes to problem-free emptying.


Image credit: Freepik.com

**List of foods high in cellulose includes**:

》 **vegetables**, **fruits**, **legumes** (beans, lentils, green peas),

》 **leafy** and cabbage **vegetables**.

# Soluble fibre

**These types of fibre are water soluble**, they have **a gel-like consistency** when in contact with water, thus gaining the ability **to be digested by the intestinal bacteria**, promoting their **growth** and **multiplication in intestine**.

## Beneficial bacteria in the intestine digest (ferment) soluble fibre

— they take **other substances from the original fibre**,
— have **beneficial effects for human health**.

Among the most beneficial of these are **lactic acid** or **acetic acid**.

## About the fibre that gut bacteria can digest - ferment,

— we say, that it has **PREBIOTIC** property.

## Sources of health-beneficial soluble prebiotic fibre are:

— whole grain wheat, wheat, oatmeal and other grain bran,
— potatoes, legumes (beans, peas, and other),
— The greenery and fruit, nuts and the seedlings


Image credit: Freepik.com

- Plant fiber - soluble and insoluble - is **beneficial to human health**.
- **The positive health effects of plant fibre** include the following features:

**Physiological and health effects of plant fiber**

- Increases the volume of food without increasing the energy content in the range of digestible carbohydrates.
- Provides a feeling of satiety and reduces appetite.
- It binds water and forms a viscous gel with water during digestion, which slows down gastric emptying and regulates transit time through the intestine.
- Partially protects carbohydrates from digestive enzymes, which results in delayed glucose absorption and lower concentrations of glucose and insulin in the blood after a meal (reduces the glycemic index of the diet).
- Reduces total and LDL cholesterol, which may reduce the risk of cardiovascular disease.
- Regulates blood sugar levels.
- In diabetic patients, it may reduce the level of glucose and insulin in the blood.
- In healthy individuals, it may reduce the risk of developing diabetes.
- It accelerates the passage of undigested food and stool through the digestive tract, thereby facilitating regular bowel movements.
- it increases the weight and volume of stool, thus reducing the risk of constipation.
- It regulates the pH in the intestine and promotes the production of short-chain fatty acids (acetic acid, propionic acid), which may contribute to reducing the risk of colorectal cancer.

# SACCHARIDES

Remember!

Carbohydrates are among the essential nutrients (macronutrients).

The main function of carbohydrates is that they provide the body with energy.

Carbohydrates are divided into sugars starches and fibre.

Excessive intake of simple sugars promotes weight gain and increases the risk of obesity.

The intake of free sugars should not exceed 10% of the daily energy intake.

Starchy foods are a natural part of a good diet and a healthy diet for everyone.

Starchy foods should cover ¼ of the "Healthy Plate" (½ "vegetables, fruits" - ¼ "starches" - ¼ "proteins"_ *see attached pictures*!

Wholegrain cereal foods contain more fibre than white or refined cereal foods and often contain more other nutrients (such as B vitamins).

It is recommended to give preference to whole grain cereal foods over grain foods of refined flour whenever possible.

Dietary fibre is a set of indigestible carbohydrates found in plant foods.

Fibre can be water insoluble (cellulose) or soluble (pectin, inulin). Insoluble fibre promotes bowel movement and contributes to smooth bowel movements. Soluble fibre forms a gel-like consistency with water, proving digestibility for gut bacteria, thus promoting the growth and proliferation of beneficial gut bacteria.

All types of dietary fibre are beneficial to health.

**Recommended daily intake of FIBER for adult men, women:**

- 35 - 45 g per day

**Recommended daily fibre intake for children:**

- age + 5 g per day

# 04

# Fats - lipids

# FATS

## Definition and importance of lipids


**Fats (lipids) are chemical compounds composed of:**

— **fatty acids** and

— **glycerol** (glycerol is a specific part of alcohol).

**Fats play an important role in the metabolism of all living organisms.**

**Fats are an important part of a person's diet and nutrition.**

**The role of fats (lipids):**

— is not only **to give energy to** the body and function as the source the self-energy,

— but they also have **other important functions in** the metabolism of organism.

**Fats are a chemically heterogeneous group of substances,** the common feature being that:

— are insoluble in water and— soluble in organic solvents.

Image credit: Freepik.com

# Chemical and physical properties of lipids

**The basic structural components of fats are FATTY ACIDS and GLYCEROL.**

**80-95% of all fats contain 3 MK* and 1 glycerol:**
— its called **TRIGLYCERIDES** / **TRIACYLGLYCEROLY**.

**Physical properties of fats (triglycerides):**
— are different and depend on the fact, from which sources they come from, plant or animal ones

**Fats of animal origin are solid at room temperature** (tallow, lard, butter),

**Fats of vegetable and fish origin are usually liquid at room temperature:**
(the oils of the oil, the cod liver),
— **The exceptions** are **coconut**, **palm**, and **palm kernel fat**, that have **tropical origin** and which (even though they come from plant) have a **solid state** at high temperature.

**The aggregation depends on the chemical structure of the fatty acids,**
— depending on **how much saturated fatty acids** they contain, which have a **SOLID consistency** and are prevalent in fats (butter, lard, coconut fat), and **how much unsaturated fatty acids** they contain, which have a **LIQUID consistency** and are prevalent in vegetable oils (olive, rapeseed, sunflower and others) and fish oil.

*FA- fatty acid

# FATS - LIPIDS

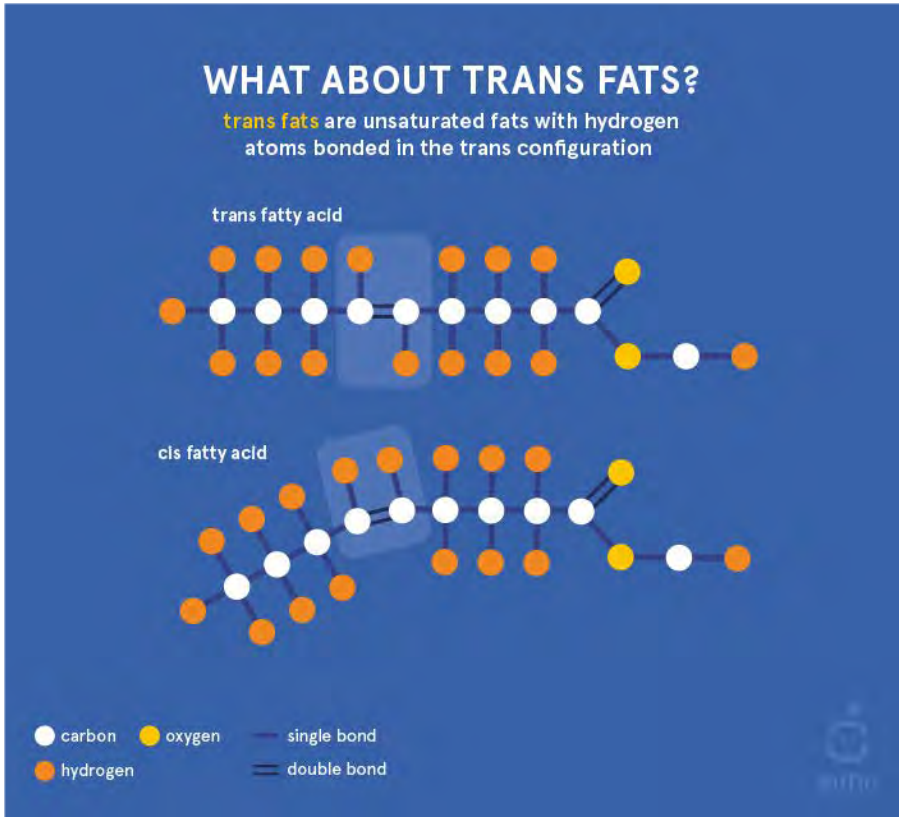
## Saturated and unsaturated fatty acids

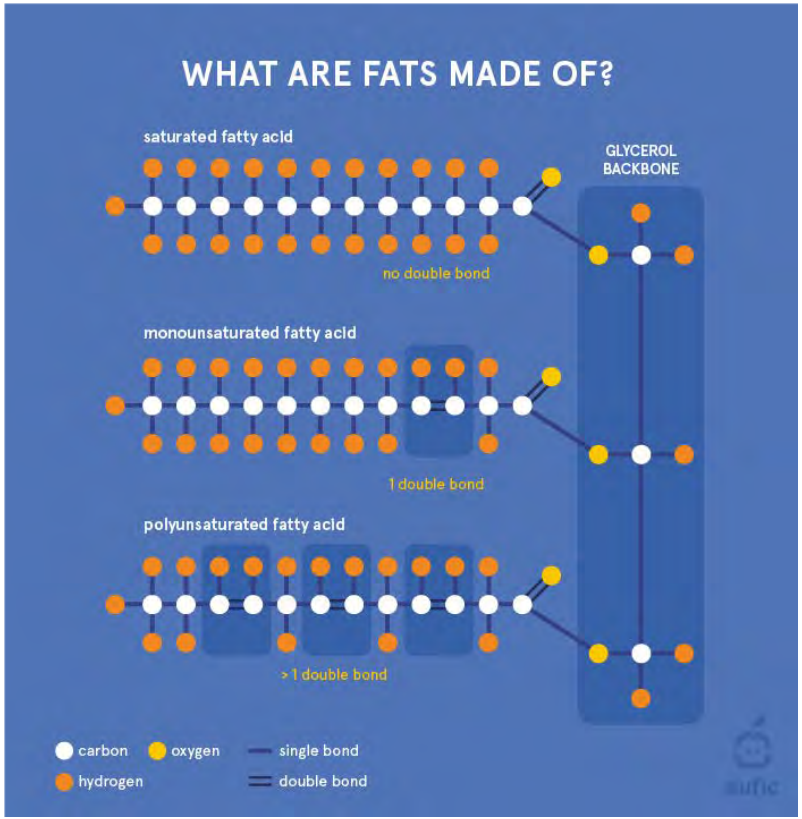
**Fatty acids (FA)**: are divided into saturated fatty acids and unsaturated fatty acids according to their chemical structure.

**Saturated FA**: contain exclusively single saturated chemical bonds between the carbon atoms that make up their chain, which are graphically indicated by 1 stick (note: carbon has the chemical abbreviation "C"). Due to this, saturated FAs are solid at room temperature.

**Unsaturated FA**: contain not only single saturated chemical bonds between the carbon atoms that make up their chain, which are graphically indicated by 1 stick, but also 1 or more double unsaturated chemical bonds, which are graphically indicated by 2 sticks. Due to these double bonds, unsaturated FAs are liquid at room temperature.

eufic


WHAT ABOUT TRANS FATS?
trans fats are unsaturated fats with hydrogen atoms bonded in the trans configuration
trans fatty acid
cis fatty acid
carbon
oxygen
single bond
hydrogen
double bond


WHAT ARE FATS MADE OF?
saturated fatty acid
GLYCEROL BACKBONE
no double bond
monounsaturated fatty acid
1 double bond
polyunsaturated fatty acid
>1 double bond
carbon
oxygen
single bond
hydrogen
double bond

# FATS - LIPIDS

## Monounsaturated (monounsaturated) MK:

- **They** contain in their chain between carbons (C) in addition to **single saturated bonds**, one double **unsaturated** bond.
- Monounsaturated fatty acids have several significant **positive properties** in human food and nutrition.
- **They support the health of** the body by **reducing the risk of cardiovascular disease** and are a **structural component of the membranes of** the **cells of the** human body.
- Monounsaturated fats are therefore **part of a healthy diet.**
- Me's most important food is **oleic acid**, ethoic acid.
  the only other sources are **olive** and **rapeseed oil**.

Images courtesy of Freepik.com

# FATS - LIPIDS

## Polyunsaturated (polyunsaturated) FA:

They contain in their chain between carbons (C) in addition to single saturated bonds and one double unsaturated bond.

- Monounsaturated fatty acids have several **significant positive properties** in human food and nutrition.

- **They promote health**, mainly by reducing the risk of cardiovascular diseases and are also a structural part of the membranes of all cells of the human body.

- Monounsaturated fatty acids are therefore part of a healthy diet.

- The best-known monounsaturated fatty acid is **oleic acid**, a rich source of which is olive and rapeseed oil.

Images courtesy of Freepik.com

# FATS - LIPIDS

## Essential fatty acids:

**Saturated and monounsaturated** fatty acids can be produced by the cells of the human body a**s part of their own** metabolic processes.
Polyunsaturated ω-6 fatty acids and ω-3 fatty acids must be **obtained from food**. Polyunsaturated fatty acids are therefore called essential fatty acids.
The **main source of ω-6 fatty acids** is vegetable oils, especially sunflower oil.
Flax seeds, walnuts, rapeseed oil (ALA) and fish oil (EPA, DHA) are **rich sources of ω-3 fatty acids.**

Images courtesy of Freepik.com

# FATS - LIPIDS

## The ratio of ω-6 to ω-3 fatty acids in the diet


- It is considered important from a nutritional and health point of view for people to drink ω-6 MK and ω-3 MK in diet with correct ratio.

Because:
**Both types of fatty acids** are involved in the inflammation diseases.

For example:

**ATEROSCLEROSIS** of the arteries (Atherosclerosis is a condition characterized by hardened and thickened artery walls and loss of elasticity.)
These changes can lead to narrowing or even blockage of the arteries, resulting in heart attacks and strokes.

The optimal ratio of ω-6 and ω-3 FAs in the diet is considered to be 1-1.5 : 1, while a ratio of 4-5 : 1 is considered to be acceptable.

**Analyses in Slovakia and other countries** have found a significant imbalance in the intake of ω-6 FA and ω-3 FA in the common diet, in a ratio of 10–20:1.

You need to change the diet so that the intake of ω-3 MCs increases at the expense of ω-6 MCs.
It should significantly increase the consumption of fish (especially fatty fish), flaxseed, linseed oil, walnuts, and instead sunfloweroil, use rapeseed oil, and the ratio of ω-3 Me and ω-6 Me (2:P) in this oil.

# Trans-fatty acids (trans-MK)

## Trans *Fatty Acids (TFA)* :

— **they are only rare**

— they are arising in **technological** process of **solidification of vegetable oils** by **inhaled hydrogen/** HYDROGENATION.

## Double chemical bonds in fatty acids can occur in space:

— either in the "CIS" configuration: the hydrogen atoms on either side of the double bond are on the **same side of space,**
or in the "TRANS" configuration: the hydrogen atoms in the chain at the double bond are on **opposite sides of the chain.**

## Technological process of solidifying vegetable oils that have a liquid consistency,

— into **soluble fats**, which
— have a **solid consistency** at room temperature, is called "HYDROGENATION".

## In the hydrogenation of unsaturated FA:

— **hydrogen** is driven **into vegetable oils**
— In this way**, the** CONJUGATED FAT (the older types of margarine) **is formed**.

Image credit: Freepik.com

# Trans-fatty acids (trans-MK, SFA)

## The relationship of solidified fats to health and disease

We are talking about the issue of hydrogenated fats with a higher content of trans-MK because they are harmful to health.

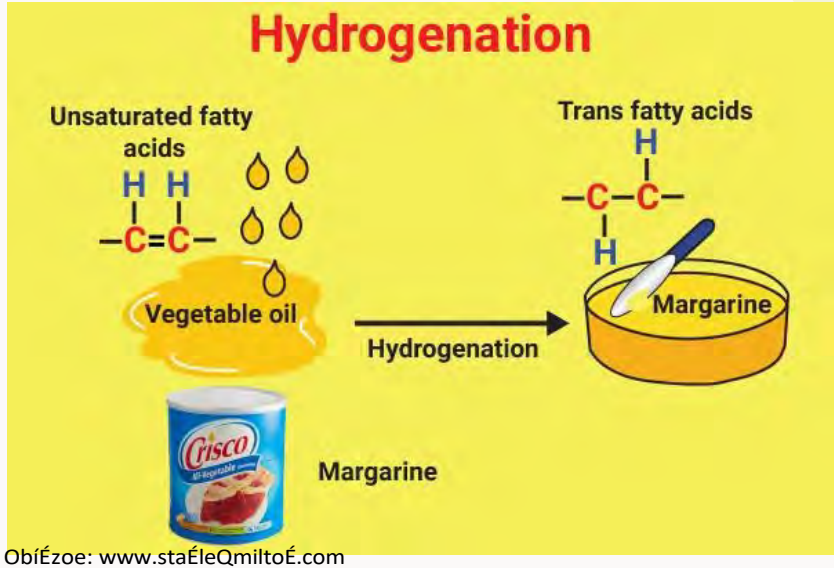
**They harm human health** primarily by:

— increasing the concentrations of the harmful fraction of cholesterol ("bad" LDL-cholesterol) and

— reducing the concentrations of the beneficial fraction of cholesterol

("good" HDL-cholesterol) in the blood,

— they are therefore dangerous for the heart and blood vessels.




ObíÉzoe: www.staÉleQmiltoÉ.com

## Regulation of trans-fatty acids in food

**The food industry** has **adapted to the new situation** due to scientific discoveries and evidence of the harmfulness of trans-MK. The **technology of producing vegetable margarines** intended as butter substitutes for spreading on bread and pastries has changed. Modern margarines, which can now be commonly found on store shelves as vegetable butter substitutes, **no longer contain practically no trans-MK** (or only traces of them). Several published scientific analyses have confirmed that the presence of trans-MK is not significant in the current vegetable spreadable fats they have analyzed, but is low (less than 0.5%) or non-existent in comparison with older versions. Similarly, **when frying**, by using higher-quality fats and gentler frying methods, not only a lower fat content in the prepared food can be achieved, but also a significantly **lower trans-MK content**.

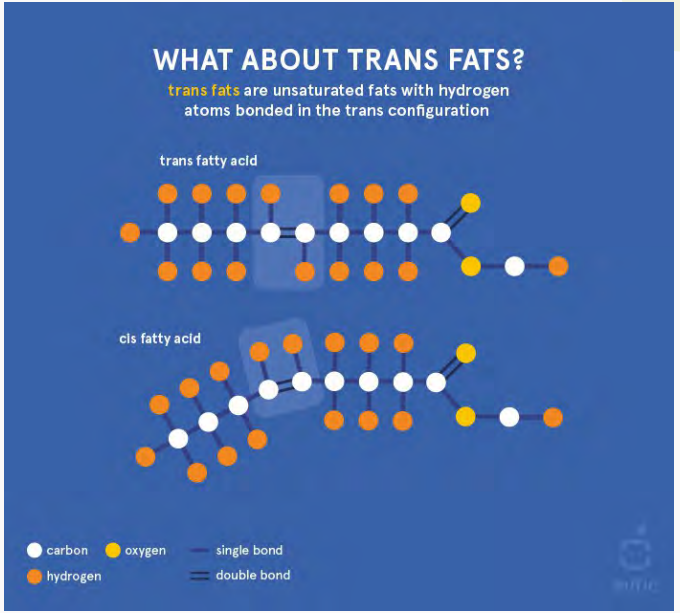



Image credit: EUFIC

**The daily intake of trans-fatty acids** should be less than **1% of the daily energy intake** according to the **World Health Organization** (*WHO*), which in a normal diet is a **maximum of 2 g trans-FAT per day**.

**Restrict in law the trans-MK content of all foods** is a possibility. The leading country that introduced such a law in its country back in 2003 was Denmark, which stipulated that the upper limit of trans-FA in foods intended for human consumption **must not exceed 2% of the total fat content.**

**The EU European Commission has set the upper limit of TFA in food at: 2 g TFA per 100 g fat**

*(EU 2019) <https://ec.europa.eu/food/safety/labelling_nutrition/trans-fat-food_en)>

# FATS - LIPIDS

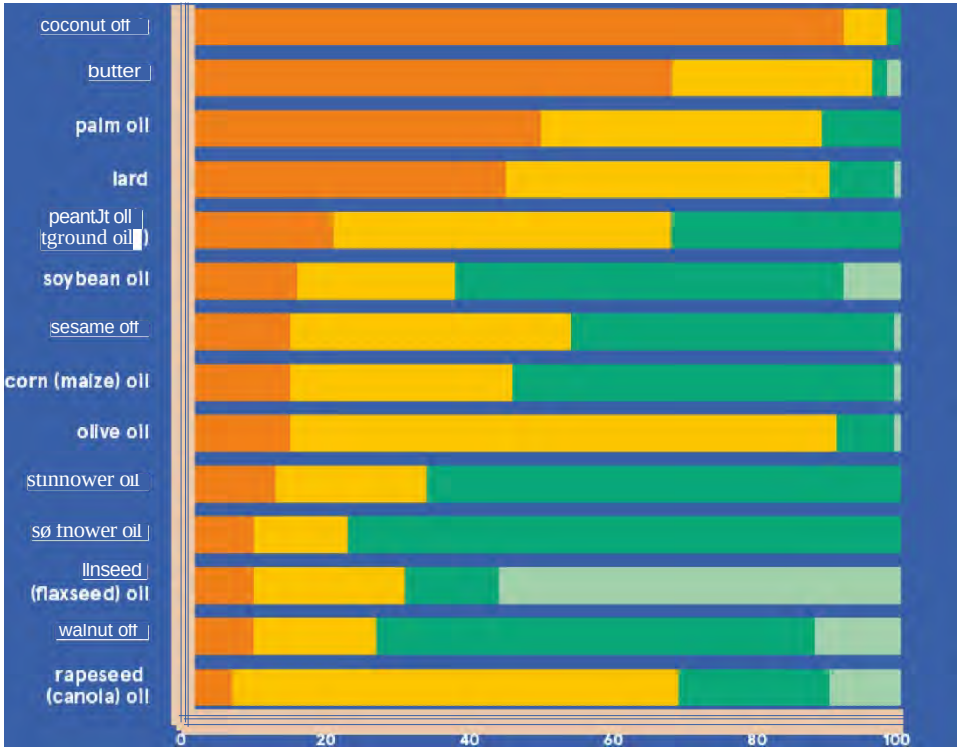
## Physiological effects and importance of fats for humans

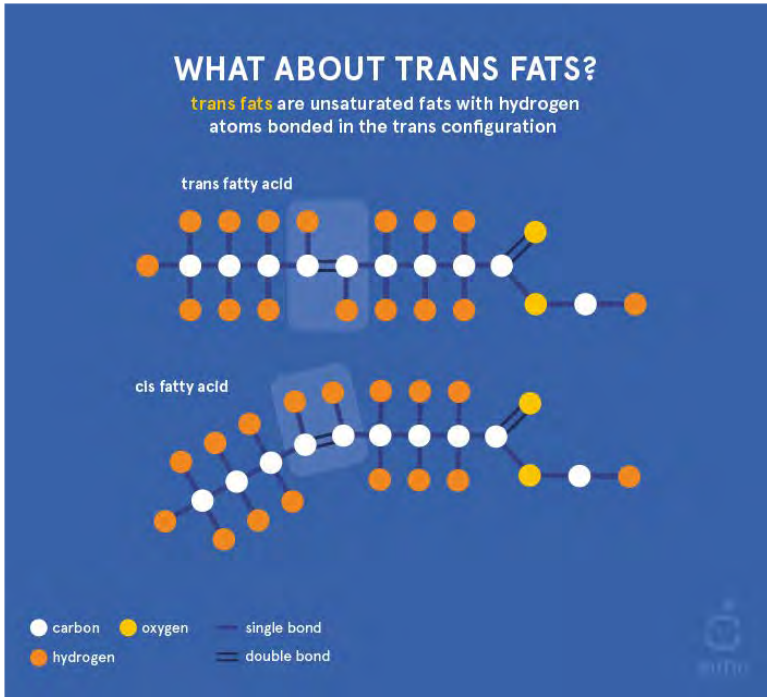
Fats consumed in food are not only an important source of energy for humans, but also fulfill many other very important functions in the functioning of the human body. Let us list at least some of them:

- All fats are a rich source of energy (calories).
- All fats contribute to the feeling of satiety and give food a pleasant taste and a soft consistency.
- All fats - saturated and unsaturated FA - are part of the structure of cell membranes.
- Omega-6 FA participate in cholesterol metabolism, regulate several processes and activities in the cells of various organs.
- Omega-3 fatty acids suppress inflammation, allergic reactions and blood clot formation, improve the body's immune function, help normalize heart rhythm, reduce the level of fats (triglycerides) in the blood, support normal cell development, are part of the gray cortex of the brain and the retina of the eye, reduce blood pressure, protect against diabetes, cardiovascular diseases and cancer.

eufic

# culinary oils & fats



# Healthy fats

## NUTS:

walnuts, hazelnuts, steam, almonds

## SEVEN:

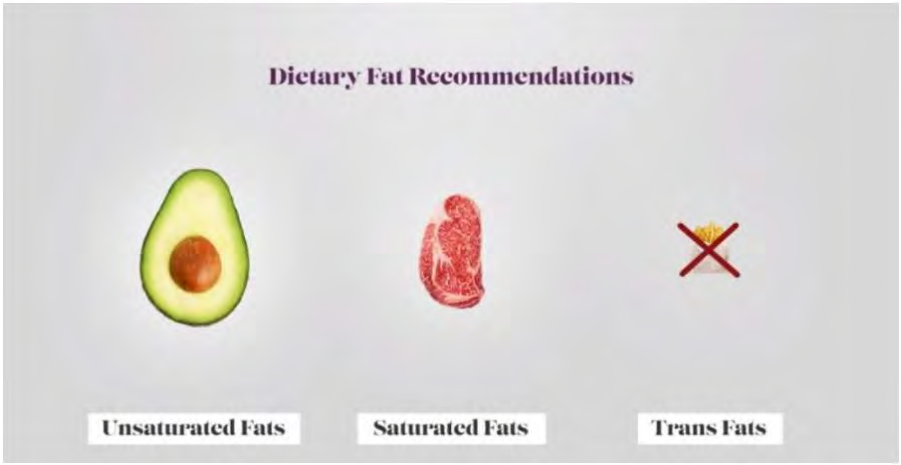
linseed, sunflower, pumpkin, hemp

## OILS:

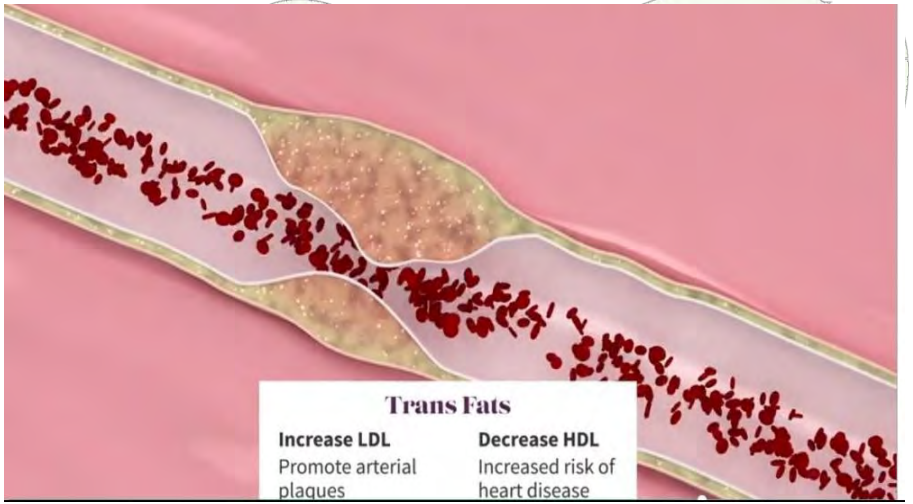
rapeseed, linseed, olive, sunflower

## FISH:

from cold seas, fatty: salmon, tuna






https://rudimentalpantry.com/saturated-vs-unsaturated-fats-are-they-good-or-bad/

# Fats for the end!

Remember!

**Fats** are an **important part of diet and nutrition**.

**Fats** have the **highest energy density** among the essential nutrients (proteins, carbohydrates, fats). Nevertheless, fats are an important part of a rational diet for all people and belong in a healthy dietary pattern because they provide essential fatty acids and allow the absorption of fat-soluble vitamins in the intestine.

Despite the great importance of fats in the human diet, a diet rich in fats can lead to to obesity.

**Fatty** acids (FAs) are **an essential component of fats**.

**Saturated fatty acids** (found mainly in animal fats, but also in coconut and palm fat) are a health hazard and increase the risk of cardiovascular disease when consumed in excess.

**Unsaturated FAs** (found mainly in vegetable oils, nuts, seeds and fish) promote health and reduce the risk of cardiovascular disease.

# Fats for the end!

**An incorrect fatty acid composition** depending on the predominant type of dietary fat consumed (animal, vegetable) can lead to the development of atherosclerosis and related cardiovascular diseases, high blood pressure, diabetes and some types of malignant tumours.

**Essential MKs** are an essential part of a proper diet and nutrition. It is therefore important to get the vast majority of your fat intake from foods that are part of a healthy diet (vegetable oils, nuts, seeds, oily fish).

**The main source of ω-6 MK** is vegetable oils, especially sunflower oil.

**Rich sources of ω-3 MK** are flaxseeds, walnuts, rapeseed oil and fish oil.

**Fish oil** is one of the richest sources of essential ω-3 FAs (EPA, DHA). ω-3 FAs are anti-inflammatory, protect the arteries from atherosclerosis and the heart from coronary disease.

**Trans-fatty acids (trans-Fats)** are harmful to health. Therefore, do not exceed the daily recommended intake of trans fats.

# Fats for the end!

**Be careful what fats you spread on bread and pastries** and **what fats you use in baking**. Today's vegetable spreads (vegetable "butters") no longer contain TFAs and are not a threat to health. They are now a better choice than cow's butter and are also quite tasty.

**If you insist on eating butter** (e.g. because of its unmistakable taste), try alternating vegetable spreadable fats with butter (e.g. 5 times a week vegetable fat, 2 times a week butter).

**Read the information on the packaging of bakery products**. You won't find information about the TMK content there today. However, if biscuits, biscuits, cakes, etc. state that they contain 'solidified vegetable fats', buy a different brand.

# 05

# Micronutrients

Vitamines - Minerals - Trace elements

# Vitamins

**Vitamins are micronutrients t**hat the body needs to perform a range of normal physiological functions. However, these micronutrients are not produced in our bodies and must therefore be obtained from the food we eat. Vitamins are therefore considered essential substances **(essential substances are substances** that are essential for life that the body cannot synthesize in sufficient quantities for normal functioning and for maintaining adequate health, growth and development, and which must therefore be obtained from the diet).

**Vitamins are organic substances** that are generally classified as fat-soluble or water-soluble.

**Fat-soluble vitamins** (vitamin A, vitamin D, vitamin E and vitamin K) dissolve in fats and tend to accumulate in the body. If a person does not use all the fat-soluble vitamins they consume, the remaining unused amounts are stored in the liver and fatty tissues as reserves.

**Water-soluble vitamins** (vitamin C and the B-complex vitamins such as vitamins B1, B2, B3, B5, B6, B7, B9, vitamin B12) must dissolve in water before they can be absorbed by the body, and therefore cannot be stored in the body. Any water-soluble vitamins that the body **does not use are excreted by the kidneys in the urine.**

For all vitamins, the following are developed: the DAILY RECOMMENDED NUTRITION DOSAGE.
These values serve as guidelines for good nutrition and as the scientific basis for the Dietary Guidelines.

# Minerals and trace elements

**Minerals are also micronutrients** that, like vitamins, the body needs to perform a large number of normal physiological functions. They are substances that are essential for optimal health. Minerals are not produced in our bodies and must therefore, like vitamins, be obtained from the food we eat. Minerals are also **ESSENTIAL SUBSTANCES.**

**Minerals (MS) are inorganic elements present** in soil and water that are absorbed by plants or consumed by animals. The MN group mainly includes calcium, magnesium, sodium, potassium, manganese, and others.

**Trace elements are substances** that we must consume from our diet in very small, trace amounts. The trace element group includes many substances, some of the most important of which are iron, iodine, zinc, and copper. We must also obtain trace elements from our diet, so they are, like vitamins and minerals, **ESSENTIAL SUBSTANCES.**

**Sources of minerals and trace elements**. We list them in the texts of the educational brochure

# Sources of minerals

## Minerals:

**Calcium**: yogurt, cheese, milk, salmon, green leafy vegetables

**Magnesium**: spinach, broccoli, legumes, seeds, whole grain bread

P**otassium**: meat, milk, fruit, vegetables, cereals, legumes

**Sodium**: salt, soy sauce, vegetables

**Chlorides**: salt

# Sources of trace elements

## Trace elements:

**Iron:** red meat, poultry, eggs, fruits, green vegetables, fortified bread

**Zinc:** meat, shellfish, legumes, whole grains

**Iodine:** iodized salt, seafood

**Selenium**: foods, nuts, nuts, nuts, nuts, nuts, nuts

**Selenium**: organ meats, seafood, walnuts

**Chromium**: meat, poultry, fish, nuts, cheese

**Copper:** shellfish, nuts, seeds, whole grains, beans, prunes

**Fluorine**: fish, teas

**Manganese**: nuts, legumes, whole grains, tea

# Thank you for your attention!

Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools) Project
Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Energy in food
# Chapter 2

Minárik Peter, Mináriková Daniela, Sremaňáková Jana

INNOVATIVE STEPS

# ENERGY IN FOOD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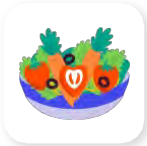
[1]SOA, BMC SAV, IPI VŠZASP, OÚSA
[2]SOA, FAFUK, IPI VŠZASP
[3]SOA, WCRF


# CONTENTS

# 1 Energy in numbers



# Energy and calories

- The human organism **requires** a constantly recurring **flow of energy** for its existence.

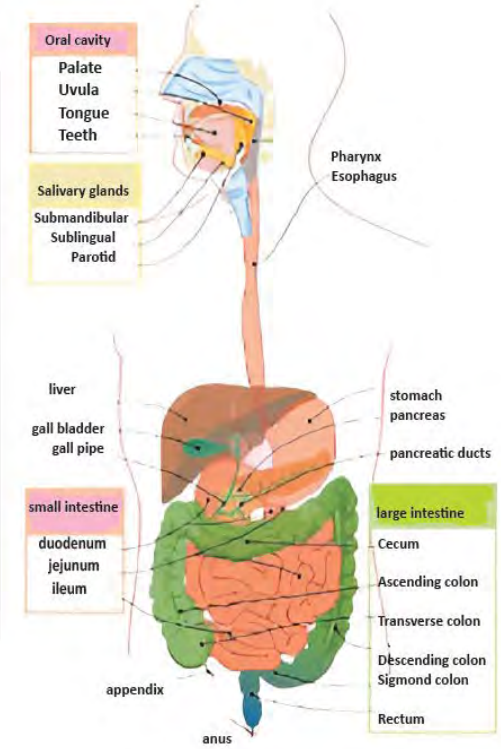
- **The continuous supply of energy** and its conversion into necessary physiological processes is a fundamental prerequisite for the existence of every living organism.
- The popular name for the term "**energy**" is the expression "**calorie**"
- in this text we will use the correct term "**energy**", "**energetically**".

# Energy and calories

- **The source of energy** is the FOOD/MACRONUTRIENTS in animal and plant foods.

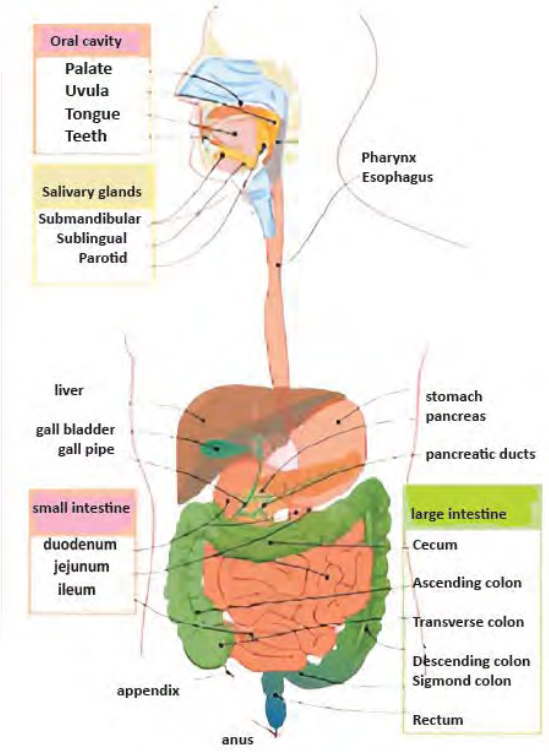
- **Macronutrients** are PROTEINS, CARBOHYDRATES, FAT and ALCOHOL.

- **To get  energy from the diet:**
the ingested food must first be digested in the digestive tract with digestive enzymes.



# Digestion, absorption, metabolism

- **DIGESTION (digestion)** is the enzymatic breakdown and breakdown of nutrients in foods and beverages to form simpler substances that provide energy and building blocks for cells, tissues and organs of the human body.
- **ABSORPTION** is the passage of simple substances formed in the digestive tract during the digestion of nutrients from food, through the wall of the small intestine into the blood capillaries and bloodstream. The simpler and smaller substances absorbed from the gastrointestinal tract are transported through the bloodstream to the cells of organs and tissues throughout the body, where they undergo complex metabolic cycles.
- **METABOLISM (ionic transformation)** changes some substances into other substances, which are the source of energy and heat.



# 2 Nutrients as energy source

**The sole source of energy is themacronutrients in food:**

**PROTEIN, CARBOHYDRATE, FAT, ALCOHOL**

# Energy density of essential nutrients

- **Energetic density**: as the amount of energy (calories) in **100 g** of nutrient or food, in drinks **100 ml** of liquid
- **Energetic density of basic nutrients** (proteins, sacharides, fats) **is <u>different.</u>**

1 gram of proteins, sacharides, fats and alcohol contains following amounts of energy/ calories:

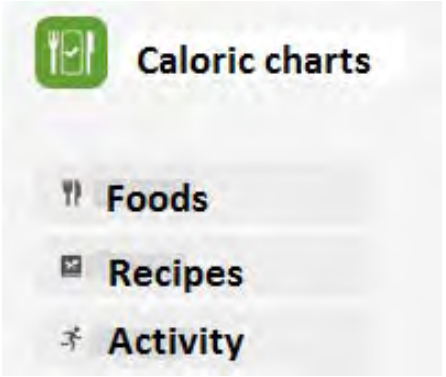
| | Proteins | Sacharides | Fats | Alcohol |
|---|---|---|---|---|
| kcal/1 g | 4 kcal | 4 kcal | 9 kcal | 7 kcal |
| kJ/1 g | 17 kJ | 17 kJ | 38 kJ | 29 kJ |
| 1 kcal = 4,18 kJ (= 4,2 kJ) | | | | |

Note: Energy is given in units of kilojoules (kJ) or kilocalories (kcal).
Energy density = energy density = energy content.

# Energy content of food

- Energetic density of basic nutrients: simple chart is sufficient.
- Energetic density of food: we need food and caloric charts.

| 1 gram of proteins, sacharides, fats and alcohol contains following amounts of energy/ calories: | | | | |
|---|---|---|---|---|
| | Proteins | Sacharides | Fats | Alcohol |
| kcal/1 g | 4 kcal | 4 kcal | 9 kcal | 7 kcal |
| kJ/1 g | 17 kJ | 17 kJ | 38 kJ | 29 kJ |
| 1 kcal = 4,18 kJ (= 4,2 kJ) | | | | |



Nestlé.

| WARTOŚĆ ODŻYWCZA/DECLARAȚIE NUTRIȚIONALĂ / VÝŽIVOVÉ ÚDAJE | 100 g | 30 g | 30 g + 125 ml mleka[2]/lapte[2]/mlieka[2] |
|---|---|---|---|
| Energia/Valoare energetică | 1664 kJ 394 kcal | 499 kJ 118 kcal | 684 kJ 162 kcal |
| Tłuszcz/Grăsimi/Tuky | | 1,8 g | 1,9 g |
| - w tym: kwasy nasycone/din care acizi grași saturați/z toho nasýtené mastné kyseliny | 4,8 g | 1,4 g | 1,5 g |
| Węglowodany/Glucide/Sacharidy | 73,5 g | 22,0 g | 28,4 g |
| - w tym: cukry/din care zaharuri/z toho cukry | 18,8 g | 5,6 g | 11,8 g |
| Błonnik/Fibre/Vláknina | 5,9 g | 1,8 g | 1,8 g |
| Białko/Proteine/Bielkoviny | 8,4 g | 2,5 g | 6,9 g |
| Sól/Sare/Soľ | 1,01 g | 0,30 g | 0,47 g |

[2] odtłuszczonego/degresat/odtučneného

| WITAMINY I SKŁADNIKI MINERALNE/ VITAMINE ȘI MINERALE / VITAMÍNY A MINERÁLNE LÁTKY | 100 g (%)*** | 30 g | 30 g + 125 ml mleka[2]/lapte[2]/mlieka[2] |
|---|---|---|---|
| Ryboflawina (wit.B2)/Riboflavină/Vitamín B2 | 1,69 mg (121%) | 0,51 mg | 0,73 mg |
| Niacyna/Niacină/Niacín | 16,0 mg (100%) | 4,80 mg | 4,92 mg |
| Witamina B6/Vitamina B6/Vitamín B6 | 1,18 mg (84%) | 0,35 mg | 0,43 mg |
| Kwas foliowy/Acid folic/Kyselina listová | 152 µg (76%) | 45,6 µg | 52,1 µg |
| Kwas pantotenowy/Acid pantotenic/Kyselina pantoténová | 5,25 mg (88%) | 1,58 mg | 1,99 mg |
| Wapń/Calciu/Vápnik | 557 mg (70%) | 167 mg | 326 mg |
| Żelazo/Fier/Železo | 12,8 mg (91%) | 3,84 mg | 3,99 mg |

** % (***dziennej) referencyjnej wartości spożycia dla dorosłych wg rozporządzenia UE Nr 1169/2011 / ** % din consumul (***zilnic) de referință pentru un adult. / ** % (***dennej) referenčnej hodnoty príjmu dospelého.
To opakowanie zawiera około 14 porcji 30-gramowych. Dostosuj wielkość porcji do swoich potrzeb. / Pachetul conține aproximativ 14 porții de 30 grame. Recomandăm ajustarea porțiilor în funcție de necesitățile fiecărui adult. / Balenie obsahuje približne 14 porcií (à 30 g). Porcia by mala byť upravená pre deti rôznych vekových kategórií.

# Nutritional information on food packaging today looks like this

## NUTRIČNÍ HODNOTY
## OBSAH ŽIVÍN

| | 100 g müsli obsahuje průměrně/ priemerne | 1 porce/porcia (40 g müsli + 60 ml plnotučného mléka/mlieka) |
|---|---|---|
| Energetická hodnota<br>Energia | 1800 kJ<br>430 kcal | 880 kJ<br>210 kcal |
| Bílkoviny / Bielkoviny | 8,6 g | 5,4 g |
| Sacharidy | 65 g | 29 g |
| z toho cukry/cukor | 25 g | 13 g |
| Tuky | 15 g | 8 g |
| z toho nasycené/nas. mastné kyseliny | 5 g | 3 g |
| Vláknina | 6 g | 2,5 g |
| Sodík | 0,4 g | 0,2 g |
| Vitamín $B_1$ | 0,3 mg (20%*) | 0,1 mg (7%*) |
| Železo | 3 mg (20%*) | 1 mg (7%*) |
| Hořčík<br>Magnézium | 94 mg (30%*) | 45 mg (15%*) |

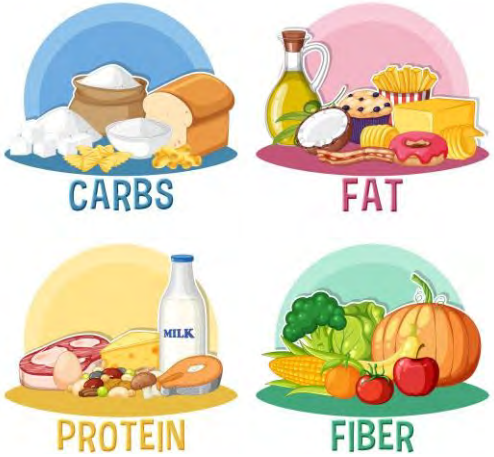
*) procenta doporučené denní dávky.
*) percentá odporúčanej dennej dávky. Prepočítané podľa Souci-Fachmann-Kraut, 6. vydanie.

# Energy and calories

- **Proteins** in excessive intake - they **are not stored** in inventories

- **Fats** in excessive intake - they **are stored** into the **body fat** reserves

- **Sacharides** in excessive intake - they are stored in the storage carbohydrate - **glycogen**, or they are mixed into triglycerides and  are stored in body **fat stores** (liver stiffening, hepatic steatosis).



# Nutrients as a source of energy

NUTRIENTS ARE SUBSTANCES IN FOOD that are:

— **energy carrier** - MACRONUTRIENTS or:

— source of significant **essential** or other significant substances - MICRONUTRIENTS

| | |
|---|---|
| Proteins: | 4 kcal/17 kJ v 1 g |
| Sacharides (carbohydrates): | 4 kcal/17 kJ v 1 g |
| Fats (lipides): | 9 kcal/38 kJ v 1 g |
| Alcohol (etanol): | 7 kcal/29 kJ v 1 g |

**Proteins** cover: **15%** from daily energy intake
**Sacharides** cover: **55%** from daily energy intake
**Fats** cover: **30%** from daily energy intake

# Nutrients as a source of energy

## PROPER NUTRITION OF HEALTHY PEOPLE:

- should contain all **3 essential macronutrients**:
- **proteins, carbohydrates, fats** in these proportions:

(with the exception of alcohol - this does not belong in normal nutrition!)

| Recommended Nutrient Ratio (Macronutrients) in a Balanced Diet | | |
|---|---|---|
| | **Share in Energy Intake (Energy %)** | **Share in Mass Intake (g)** |
| **Proteins** | 50 | 1 |
| **Fats** | 30 | 1 |
| **Carbohydrates** | 55 | 4 |

# Fat, water... and calories

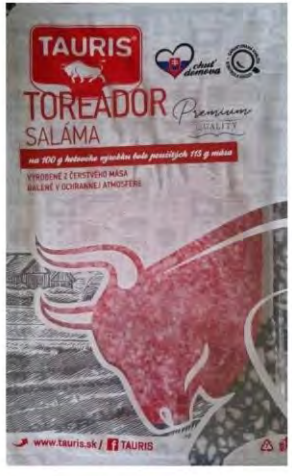
- In many foods, the **greatest influence** on their **energy density** is the RATIO OF FAT AND WATER.
- **The higher the fat conten**t (38 kJ = 9 kcal per 1 gram) and the **lower the water content** (0 kJ = 0 kcal per 1 gram) in the food, — the more CALORIES the food contains. Of course, the opposite is also true.
- **The lower the fat content and the higher the water content i**n the food, the fewer CALORIES the food contains.
- **The protein and carbohydrate content** may be **similar i**n the compared foods, but the AMOUNT OF FAT AND WATER determines the final energy density of the food.

- Examples include low-fat, semi-skimmed and whole milk.
- Another example is lean poultry ham and fatty durable salami.


# Example

## milk

| Drinking cow's milk | | |
|---|---|---|
| Full fat | semi-skimmed | low-fat |
| Fat: 3,5 g | Fat: 1,5 g | Fat: 0,5 g |
| Proteins 3,3 g | Proteins: 3,2 g | Proteins: 3,4 g |
| Carbohydrates: 5,0 g | Carbohydrates: 4,7 g | Carbohydrates: 4,9 g |
| Energy: 271 kJ / 65 kcal | Energy: 190 kJ / 45 kcal | Energy: 161 kJ / 38 kcal |




**2 048 kJ**
Taktiež 489 kcal ● Energetická hodnota

| | |
|---|---|
| ● Bielkoviny<br>Doporučený denný príjem: 103 g | 16,1 g |
| ● Sacharidy<br>Doporučený denný príjem: 185 g | 1 g |
| Cukry | 0,2 g |
| ● Tuky<br>Doporučený denný príjem: 55 g | 47,96 g |
| Nasýtené mastné kyseliny | 13,68 g |
| Transmastné kyseliny | - |
| Mononenasýtené | - |
| Polynenasýtené | - |
| Cholesterol | - |
| Vláknina<br>Doporučený denný príjem: 35 g | - |


**382 kJ**
Taktiež 91 kcal ● Energetická hodnota

| | |
|---|---|
| ● Bielkoviny<br>Doporučený denný príjem: 103 g | 20 g |
| ● Sacharidy<br>Doporučený denný príjem: 185 g | 0,6 g |
| Cukry | 0 g |
| ● Tuky<br>Doporučený denný príjem: 55 g | 1 g |
| Nasýtené mastné kyseliny | 0,3 g |
| Transmastné kyseliny | - |
| Mononenasýtené | - |
| Polynenasýtené | - |
| Cholesterol | - |
| Vláknina<br>Doporučený denný príjem: 35 g | - |

# Example

## ham

## salami

**Two meat products for comparison of fat and energy content**

| Dry salami | Chicken breast ham |
|---|---|
| • Fat: **48 g**<br>• Proteins: **16 g**<br>• Carbohydrates: 1 g<br>• Energy: **2048 kJ / 489 kcal** | • Fat: **1 g**<br>• Proteins: **20 g**<br>• Carbohydrates: 0.6 g<br>• Energy: **382 kJ / 91 kcal** |

# Do you know how to calculate the energy value of a food?

- First, the energy density in 100 g of food is calculated.
- To do this, it is necessary to know **how many grams of protein, carbohydrates and fat are found in 100 grams of food**.
- This information is r**equired to be included by** each manufacturer in the nutritional information on **both sides of the packaged food**.
-**The energy density of 100 g of food in kilojoules** (kJ) is then calculated by multiplying the number of grams of **protein** by coefficient **17.** Similarly, the number of grams of **carbohydrate** is multiplied by **17**, and finally he number of grams of **fat** is multiplied by **38**. The coefficients 17, 17 and 38 are not random numbers, but express how many kilojoules of energy are contained in 1 gram of protein, 1 gram of carbohydrate and 1 gram of fat.
- **The energy density of of 1oo g of food in kilocalories** (kcaE) is then calculated by multiplying the number of grams **proteins** by coefficient **4.** Similarly the number of grams of **carbohydrate** is multiplied by **4**, and finally he number of grams of fat is multiplied by **9**.

| |
|---|
| **4 kcal × 4.2 = 17 kJ** (energy density of proteins and carbohydrates) |
| **9 kcal × 4.2 = 38 kJ** (energy density of fats) |

*Results are rounded*

| |
|---|
| ▲ **Proteins: 4 kcal / 17 kJ per 1 g** |
| ▲ **Carbohydrates: 4 kcal / 17 kJ per 1 g** |
| ▲ **Fats: 9 kcal / 38 kJ per 1 g** |

# Do you know how to calculate the energy value of a food?

## And final result?

- Not every food is sold in a 100 gram pack.

**a muesli bar:** always less than 100 g, usually 30 g or 40 g

**a cup of yoghurt**: usually 125 g or 150 g

- When we have the energy density of a particular food in 100 g of a product, we simply multipliy this value by the value of the grannage of the specific food package.

Example 1: **Chocolate muesli bar** energy density is 1631 kJ in 100 g or 390 kcal in 100 g.
One bar has a mass of 40 g. The energy content of 1 bar will be 1631 x 0.4 = 652 kJ or 390 x 0.4 = 156 kcal.

Example 2: **Strawberry fruit yoghurt (2,8 % fat)**: energy density is 379 kJ in 1oo g or 91 kcals in 100 g. One yoghurt has a mass of 150 g. The energy content of 1 packet of yoghurt will be 379 x 1,5 = 568 kJ or 91 x 1,5 = 136 kcal.

# Do you know how to calculate the energy value of food?


We multiplied the energy content of a **muesli bar** by 0.4 because:
— one bar has only 40 grams and not 100 grams / 40 g = 100 g x 0.4.

We multiplied the energy content of 100 grams of yoghurt by 1.5 because:
— one packet of yoghurt has only 150 grams and not 100 grams / 150 g = 100 g x 1.5.

# Examples of food energy content

Table: Energy content of selected foods/beverages

- Energy values are taken from: www.kalorickétabulky.sk

| Consumed food / beverage | Portion size consumed | Energy content (per 100 g / 100 ml) | Energy content in consumed amount |
|---|---|---|---|
| Turkey breast ham | 125 g | 405 kJ / 100 g | 506 kJ / 125 g |
| Whole grain rye bread | 70 g | 752 kJ / 100 g | 526 kJ / 70 g |
| Semi-skimmed milk (1.5% fat) | 200 ml | 192 kJ / 100 ml | 386 kJ / 200 ml |
| Drinking water | 500 ml | 0 kJ / 100 ml | 0 kJ / 500 ml |

3

## Energetic Balance

## Energy requirements

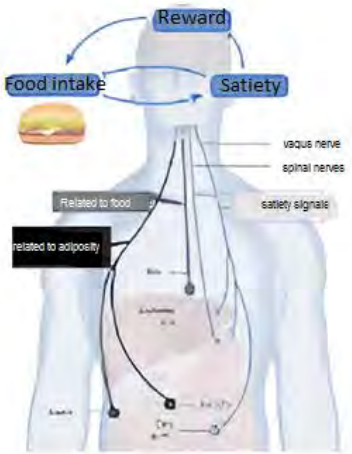
## Energy balance

# How we receive energy!
# How we give off the energy!

- The amount of energy (calories) a person should consume daily depends on several factors:
  - age
  - Motion
  - physical activity
  - health status
  - body weight (need to maintain, lose, gain)
- What goals a particular individual has with his or her own body mass also has an effect on the energy intake, i.e. whether he/she wants to maintain his/her current body weight, or whether he/she wants to lose weight (in case of overweight and obesity) or gain weight (in case of malnutrition).
- Adult people with optimal weight, i.e. they do not need to reduce or increase their weight, recommends the average daily energy intake:
  WOMEN: 1 600 to 2 400 kcals (6700 to 10 000 kJ)
  MEN: 2 200 to 3 200 kcals (9200 to 13 400 kJ)

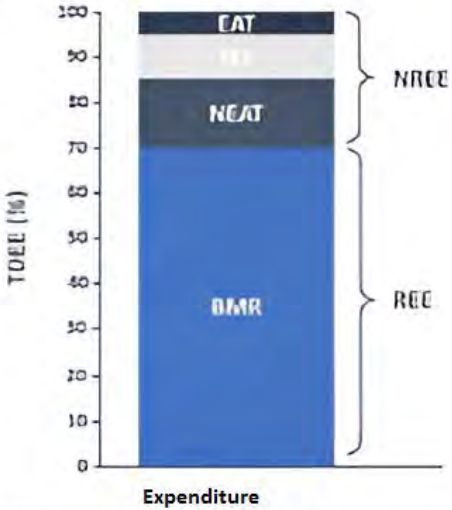
# Energy (im)balance between energy intake and energy expenditure

**Energy homeostasis is the balance between energy intake and expenditure**




**Intake**
**CNS regulates food intake**


**Balance**




**Expenditure**

TDEE (Total Daily Energy Expenditure) = total daily energy expenditure
REE (Resting Energy Expenditure) = energy expenditure at rest
REE accounts for 60% of TDEE

BMR = Basal Metabolic Rate, CNS = Central Nervous System, EAT = Thermogenesis of exercise activity, FFA = Free Fatty Acids, NEAT = Thermogenesis of non-exercise activities, NREE = Non-Resting Energy Expenditure, REE = Resting Energy Expenditure, TDEE = Total Daily Energy Expenditure, TEF = Thermic Effect of Food

Image taken from: Penesová A. Current view on obesity - causes and complications. 2024. https://web.mc.lilly.com/PP-LD-SK-0778-eLearning.html

# Energy (im)balance between energy intake and energy expenditure

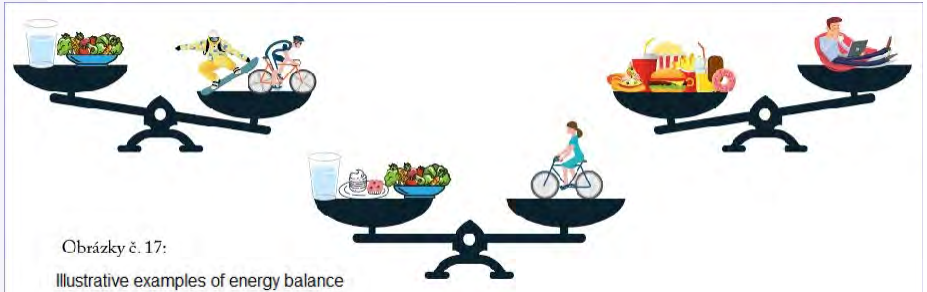
- **If someone needs to maintain their body weight**: (ideally at optimal weight), then it is inevitable,
  - to have the **same energy expenditure** as his/her dietary **energy intake**,
  - must be in a **balanced** energy balance.

- **If someone needs to reduce their excess body weight**: i.e. to lose weight on purpose (for overweight and obesity), then it is essential,
  - to have an **energy expenditure greater than** the **energy intake** of the diet,
  - must get into a **negative** energy balance.

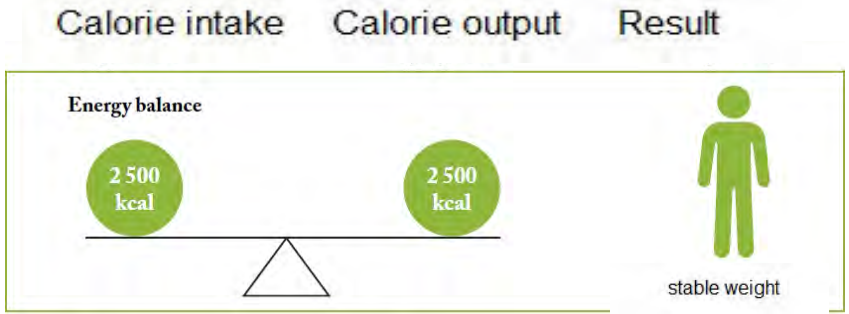
- **If someone needs to increase their body weight**: (when underweight) then it is essential,
  - to have a **lower energy expenditure** than the **energy intake** in the diet,
  - must get **into a positive** energy balance.

# Energy (im)balance between energy intake and energy expenditure

| Energy intake (food and drinks) | Energy balance = | Energy expenditure (basal metabolism, thermogenesis from food intake, physical activity) |
|---|---|---|
| Energy intake | Positive energy balance | Energy expenditure |
| Energy intake | Negative energy balance (< = less than, > = more than) | Energy expenditure |



Obrázky č. 17:
Illustrative examples of energy balance



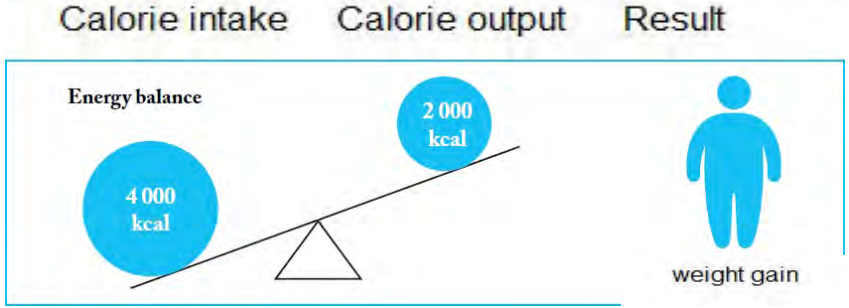




Image taken from: Minárik P, Fábry Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. *Let's try it differently. Dr. Josef Raabe Slovakia, 2021

# 4

## Energy density of food

# Energy intake & energy density of foods

**Energy intake is the result of the intake of essential nutrients** (proteins, carbohydrates, fats) and and possibly alcohol from the diet.

**Total daily energy intake depends** on two basic factors:

- **PORTION SIZES of** food, meals and drinks consumed,
- **ENERGY DENSITY of** food, food and beverages consumed.

**The energy density of foods varies considerably** depending on what is in them:

- **water** (0 kJ/100 g - 0 kcal/100 g),
- **fat** (3 800 kJ/100 g - 900 kcal/100 g),
- **carbohydrates** (1 700 kJ/100 g - 400 kcal/100 g),
- **protein** (1 700 kJ/100 g - 400 kcal/100 g),
- **alcohol** (2 900 kJ/100 g - 700 kcal/100 g).

# Energy content of foods and food groups

- **The energy density of vegetables and fruits** is LOWEST (due to the very high non-caloric water content).
- **Energy density of fats and oils** is the HIGHEST (due to the very high fat content and minimal to no non-caloric water content).
- **Between vegetables/fruits and fats/oils** there are OTHER food groups with a wide range of energy content depending on nutritional composition.

| Food | Average energy density (100 g, kJ) |
|---|---|
| **Vegetables** (lettuce – 70 kJ; corn – 440 kJ) | 100 kJ |
| **Fruits** (peach, pineapple – 140 kJ; banana – 400 kJ) | 200 kJ |
| **Dairy products, cheeses** (plain yogurt – 280 kJ; cottage cheese – 370 kJ; soft cheese 45% fat – 1,550 kJ) | 300 – 400 kJ |
| **Fish** (cod – 320 kJ; salmon – 750 kJ) | 300 – 800 kJ |
| **Meat and poultry** | 400 – 1,900 kJ |
| **Red meat** (lean beef – 450 kJ; fatty beef – 950 kJ; pork belly – 1,900 kJ) | |
| **Bread, baked goods, cereals** (whole grain bread – 750 kJ; croissant – 1,400 kJ) | 1,000 kJ |

| Food | Average energy density (100 g, kJ) |
|---|---|
| **Common sweets** (honey – 1,500 kJ) | 1,700 kJ (1,000 – 2,400 kJ) |
| **Nuts and oilseeds** (chestnuts – 900 kJ; coconut – 1,500 kJ; nuts – 2,200 to 2,750 kJ) | 2,700 kJ (900 – 3,000 kJ) |

# Energy expenditure and its components

**Total Energy expenditure consists of 3 basic components**:

1. *Basal Metabolic Rate* (*BMR*)
2. **Energy required to process food** *(Diet-Induced Thermogenesis, DIT)*
3. **Energy** *Expenditure d u e* **to Physical Activity** *(EEPA)*
   i. Spontaneous Physical activity *(Non-Exercise ActivityThermogenesis, NEAT)*
   ii. *Intentional - volitionally induced physical activity (exercise, running, jogging, swimming, etc.)*

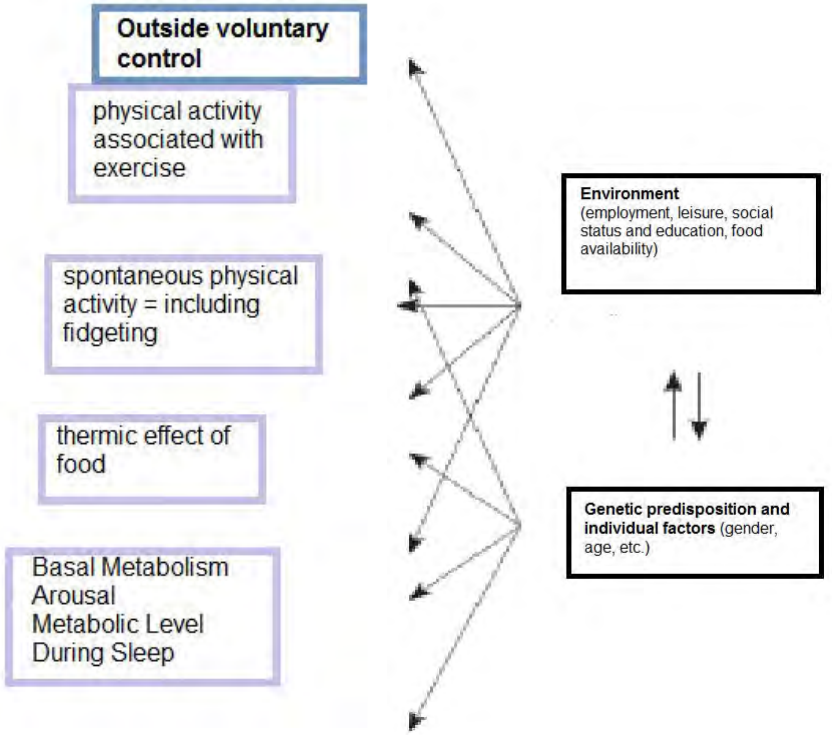



Image taken from: Minárik P, Fábry Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. *Let's try it differently. Dr. Josef Raabe Slovakia, 2021

# Basal metabolic expenditure

## Basal metabolic rate/BMR:

- basal energy expenditure, basal *metabolic rate* (*BMR*):
- accounts for **60-75% (Ø 70%)** of total energy expenditure and is the **energy expenditure of lying asleep**.

- **BMR is primarily used for:**
  - **covering the energy needs necessary** to cover all the **basic functions of life**,
  - including metabolic processes and maintenance of the internal environment of the organism, production of hormones,

  heart and blood vessel function, breathing and maintaining body temperature.

- **The results of scientific studies have confirmed:**
  - **significant relationship** between total **muscle mass** and **basal metabolic expenditure**:
  - **the more muscle mass** a person has,
  - **the higher** the **basal metabolic** (energy) **expenditure** - which is good!

- The results of studies show that it is advisable to have a large volume of muscle mass to prevent overweight.

# Energy needed to process food

## Energy required to process food/DIT:

- *Diet-Induced Thermogenesis* (*DIT*)
- accounts for **7-10%** of the total energy intake.

It is an energy expenditure associated primarily **with digestion and absorption of nutrients from the digestive tract**.

**Digestion and metabolism of protein requires more energy**

- and leads to a higher rise in DIT than is the case with carbohydrates or fats.

**Therefore, frequent consumption of cocktails, so-called "smoothies", is not recommended for targeted weight loss,**

- because the blender will do the work for the person (such as chewing, straining, etc.) and
- the drink literally "flows" through the stomach straight into the duodenum,
- where nutrients are immediately absorbed.

# Energy needed for physical activity

## Energy needed for physical activity:

- accounts for **15-30 % of** the total energy input.

- *Energy Expenditure due* **to** *Physical Activity* (*EEPA*).

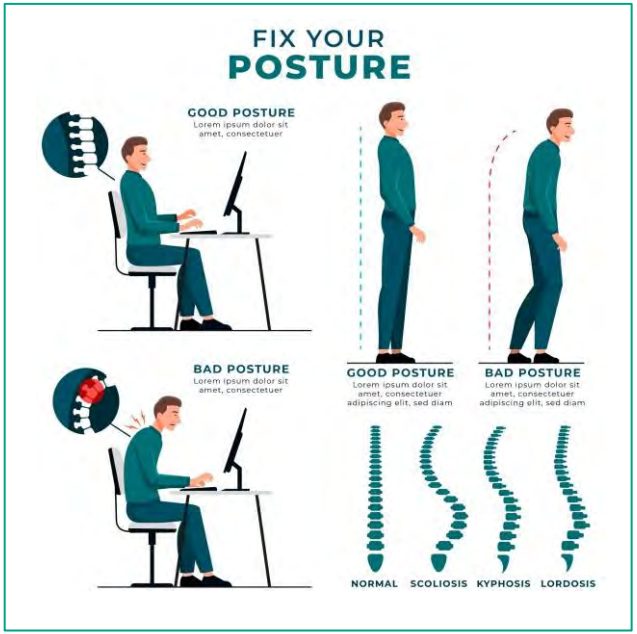
- **A person during the day performs:**
  - **self-induced FA**, but also also performs well:
  - **spontaneous movements independent of one's own will**, for which energy is also needed

- Physical activity is divided into **two basic types**:

1. **Spontaneous physical activity** (*Non-Exercise Activity Thermogenesis*, *NEAT*).
2. **Intentional - volitionally induced physical activity** (exercise, running, jogging, etc.).

# Spontaneous physical activity:

## Posture and body position




### Spontaneous physical activity

(*Non-Exercise Activity Thermogenesis*, *NEAT*)

Spontaneous FA can also be volitionally induced, but most of the time it is about **involuntary FA**.

These are muscle contractions (contractions) that are necessary for:

- **maintaining an upright posture** and **body position**, or are associated
- with **sitting** or
- with **maintaining balance** and
- changing **posture** (lying, standing, walking slowly, taking stairs, stretching, tensing muscles, fidgeting, cleaning, cooking, singing) and other activities of daily living.

Reduced spontaneous FA is one of the **proven factors in the development of overweight and obesity**.

Images courtesy of Freepik.com

# Intentional physical activity:

## exercise, training

Intentional - deliberately induced physical activity (exercise, running, jogging).

Exercise is a form of **structured movement** that typically

- takes place repeatedly over an extended period (training)

- leads to progressive improvement or maintenance of various parameters physical fitness, physical performance or health

- depending on the volume, intensity and frequency of regular physical activity.

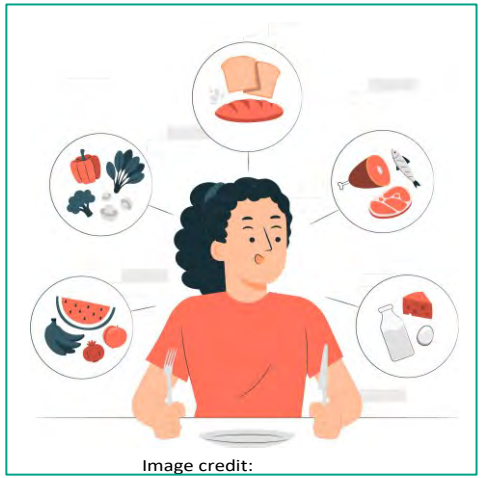
**Physically fit people** with a regular active exercise regime, or those who work hard this activity can account for up to **15 - 30%** of the day's energy expenditure.

**Physically inactive** individuals and individuals with obesity consume only **0 - 15%** of their daily energy expenditure on such activity.

5

# My need for energy

# Need
## energy intake



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The total amount of energy (caiories) a person needs to take in each day varies depending on several factors, including:

)) age,
)} gender,
)) of the height,
)) of weight,
)) levels of physical activity.

An important factor that determines how much of a diet to consume

— and **what should be the energy intake i**n such a consumed diet, is also this:
— whether the individual has a **need to reduce (over) weight** or to l**ose weight** (this applies to people who are overweight or obese),
— or **gain weight** (this applies to people suffering from malnutrition),
— or they just **need to maintain** their weight (refers to people with a suitable body mass).

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# Need
## energy intake

Estimated amounts of ingested caviar needed to maintain energy balance:

- for different age groups and different genders mostly:
- are given at three different levels of ludo physical activity.

These calculations are based on equations for estimated energy requirements using reference (recommended) average heights and reference (recommended) weights for healthy individuals in each age group and for different weights.

For children and adolescents:

- the reference height and weight differ.

For adults it has:

- the reference male is 178 cm tall and weighs 7o kg and
- The reference woman is 163 cm tall and weighs 57 kg.

# Need for energy intake

Image credit: Freepik.com

**The estimated energy intake requirement for adults is as follows:**

- **For adult women:** 1,600 to 2,400 kcal per day (6,700 – 10,000 kJ per day)
- **For adult men:** 2,000 to 3,000 kcal per day (8,400 – 12,600 kJ per day)

Within each age category and gender, the lower limit of the range represents values calculated for individuals with sedentary occupations, whereas the upper limit represents values for physically active and demanding individuals. With age, basal metabolism, which declines with aging, also decreases. Therefore, the energy intake requirement (calories) for adults gradually decreases with increasing age.

**Estimated Energy Intake Requirement for Children**

- **For young children:** 1,000 to 2,000 kcal per day (4,200 – 8,400 kJ per day)
- **For older children:** 1,400 to 3,200 kcal per day (6,000 – 13,400 kJ per day)
- **For adolescents:** 2,400 to 3,200 kcal per day (6,000 – 13,400 kJ per day)

# Need for energy intake

- The range of estimated daily energy intake requirements for the older children and adolescents category is depending on their level of physical activity.
- Boys generally have a higher calorie intake requirement than girls.

Image credit: Freepik.com

**Notes:**

- **Sedentary lifestyle:** Includes only physical activity within routine daily life.
- **Moderately active lifestyle:** Refers to a lifestyle that includes physical activity equivalent to walking approximately **2.4 – 4.8 km per day** at a speed of **4.8 – 6.5 km/h**.
- **Active lifestyle:** Refers to a lifestyle that includes physical activity equivalent to walking **more than 4.8 km per hour** at a speed of **4.8 – 8 km/h (3 – 5 miles per hour)**, in addition to physical activities required for a regular daily routine.
- **Estimates for women:** Do not include women who are pregnant or breastfeeding.

# Thank you!

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Funded by
the European Union

Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools) Project
Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Foods and food groups
# Lesson 3

Minárik Peter, Mináriková Daniela, Sremaňáková Jana

# Food and

## Food groups

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[1]SOA, BMC SAV, IPI VŠZASP, OÚSA
[2]SOA, FAFUK, IPI VŠZASP
[3]SOA, WCRF

# O čom bude reč?

1

Eat in a healthy, balanced way

2

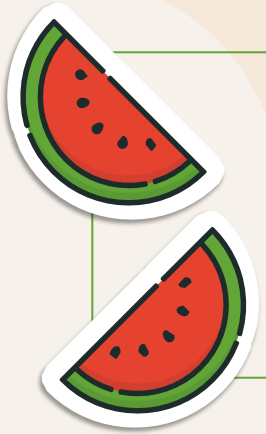
Ten healthy eating habits

3

Foods and food groups

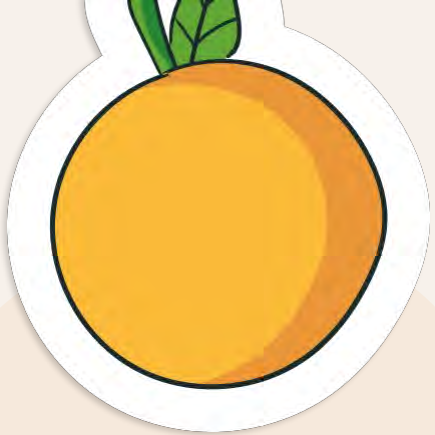
4

Vegetables and Fruit
Starchy Foods
Milk and Dairy Products
Protein-Rich Foods
Fats, Oils and Spreads
Foods High in Fat, Sugar and Salt



# 1 Eat

Varied
Healthy
Balanced



# Eat varied, balanced and don't overeat!

- Diet and nutrition are beneficial to health when they provide the body with the necessary energy and all the nutrients it needs to function at its best,
  — macronutrients: proteins, fats, carbohydrates,
  — micronutrients: vitamins and minerals, trace elements,
  — fibre and other biologically active substances

- A varied and diverse diet is important for health
  — No single food or food group may provide everything you need to be healthy.
  — Combining and eating a variety of foods from each food group can help you get the full range of nutrients your body needs.

- The more varied the diet, the lower the risk **of unbalanced diet**

# Eat varied, balanced and don't overeat!

- Choose mainly plant-based foods:
  - plant-based foods such as vegetables, fruit, whole grains and legumes,
  - provide many essential nutrients, fibre and other plant nutrients (also known as *phytonutrients*) or *phytochemicals*)
  - they also have a reasonable calorie content.
- Vegetable oils and nuts:
  - are also a valuable source of nutrients, but
  - are high in fat and therefore calories.
- To ensure a sufficient supply of all nutrients:

- it is advisable to supplement plant foods with animal foods,
- Fish, lean meat, low-fat milk and DP, and eggs.

**A diet with a predominance of plant-based foods is also good for the PLANET.**

— food and drink production has an impact on the environment environment.
— animal foods leave a larger carbon footprint, .e:
— lead to higher gas emissions

released into the atmosphere with an impact on the climate of our planet.


**Healthy eating is also ECOLOGICAL and SUSTAINABLE in the long term.**

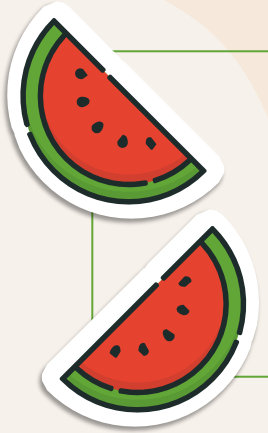
**Ideally**, all inhabitants around the globe should eat according to a **concise slogan**:

## "Eat like you want to save planet Earth, and win!"

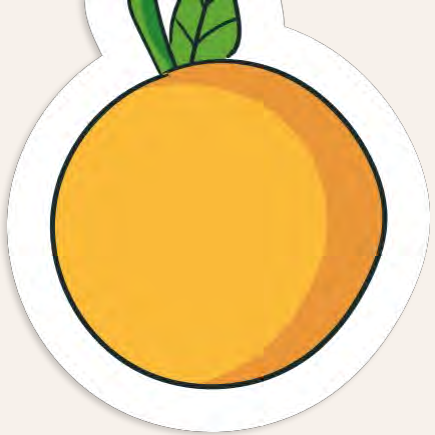
GOLIAN J, MINÁRIK P, MINÁRIKOVÁ D. 2021a. Food and nutritional literacy. Volume 1. Bratislava: Dr. Josef Raabe Slovensko, s.r.o., 2021. 1-375 p. ISBN 978-80-8140-621-8.

Image: FREEPIK.COM


Healthy food for a healthy planet Earth!



# 2 The Ten Principles of healthy diet



# Healthy lifestyle

## health promotion
## prevention of chronic diseases

Proper eating habits and health-beneficial nutrition, together with regular and adequately intense physical activity, support the health of individuals as well as society as a whole. They help achieve and maintain an optimal body weight and good physical fitness.

Among the other important components of a healthy lifestyle are primarily:

**NON-SMOKING** (complete abstinence from any tobacco products),
**AVOIDING ALCOHOL CONSUMPTION** (ideally complete abstinence or at least moderate consumption of alcoholic beverages),
**NOT USING DRUGS** (complete abstinence from any addictive substances),
**ADEQUATE SLEEP DURATION.**

# Healthy lifestyle

## health promotion
## prevention of chronic diseases

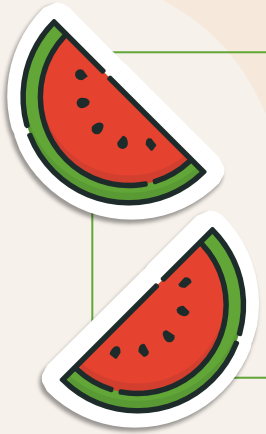
Our diet fundamentally influences this,
— whether we will live our lives well and healthily,
— or we'll be prematurely ill.

Health benefits
— the right lifestyle:
— works throughout an individual's life and
— significantly reduces the occurrence and impact of chronic diseases:

- KVCH, ZN, OB, DM, and others.

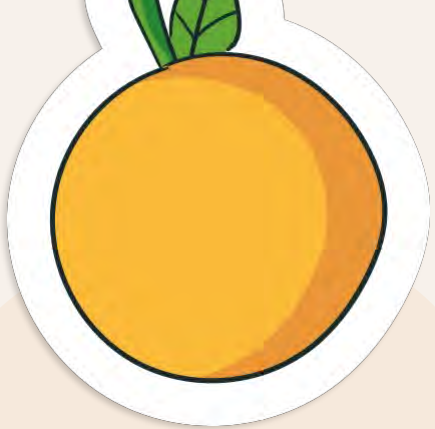
"The Ten Commandments"
— healthy eating
— and active lifestyles are shown in the table below:

1. Eat a varied and balanced diet, and do not overeat.
2. Eat more vegetables and fruits daily.
3. Prefer whole grain foods over refined grains.
4. Choose milk and dairy products with low fat content.
5. Eat more legumes and fish, and less meat.
6. Consume fats, oils, and spreads that support health.
7. Avoid foods and drinks high in sugar, salt, and sodium.
8. Drink water as part of a regular drinking regime. Limit or avoid alcoholic beverages.
9. Shop, prepare, and eat food mindfully. Pay attention to economical and safe food preparation.
10. Be physically active every day and maintain an optimal body weight and waist circumference.



# 3 Food

## Food groups



# Food

## Food groups

Foods are substances intended to be eaten by humans:
- in an unaltered, modified or processed state,
- for nutritional purposes.

Food is a source of essential nutrients. Food, snacks and beverages are nutrients,
- which serve to nourish people, namely:
- directly or indirectly, in its natural state or in a suitable adaptation.

Dietary recommendations on food groups

***Food-based Dietary Guidelines, FBDGs*** are:
- scientifically based specific advice and principles on good diet and appropriate nutrition in order to
- prevent all forms of malnutrition,
- maintain the nutritional status and health of people of all ages.

National Diet and Nutrition Recommendations.
- Most states have developed national dietary guidelines based on guidelines for particular food groups and dietary styles.
- These recommendations serve as guiding principles for the education of a country's population and for the promotion of diets to promote human health and prevent disease.

# Dietary guidelines

## Food-Based Dietary Guidelines / FBDG

Among the most important international institutions that have contributed substantially to the development of dietary guidelines, include:

EFSA / European Food Safety Authority

FAO / Food and Agriculture Organization

WHO / World Health Organization

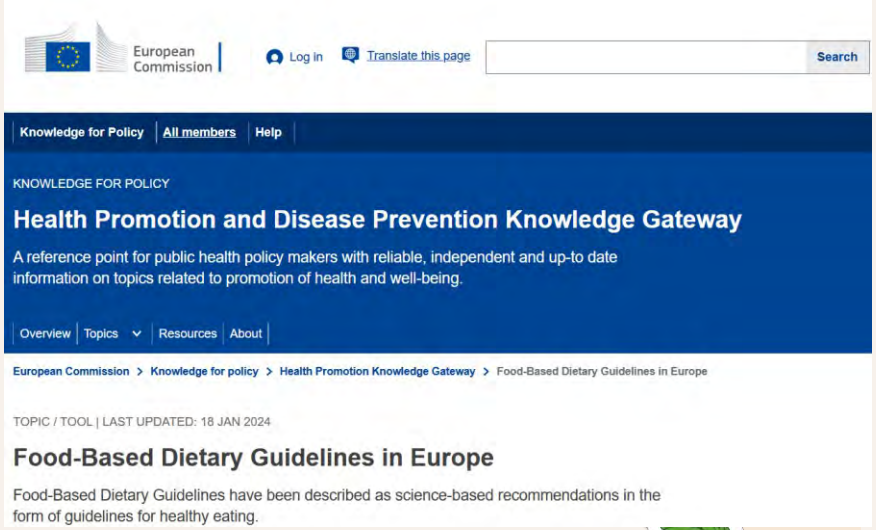


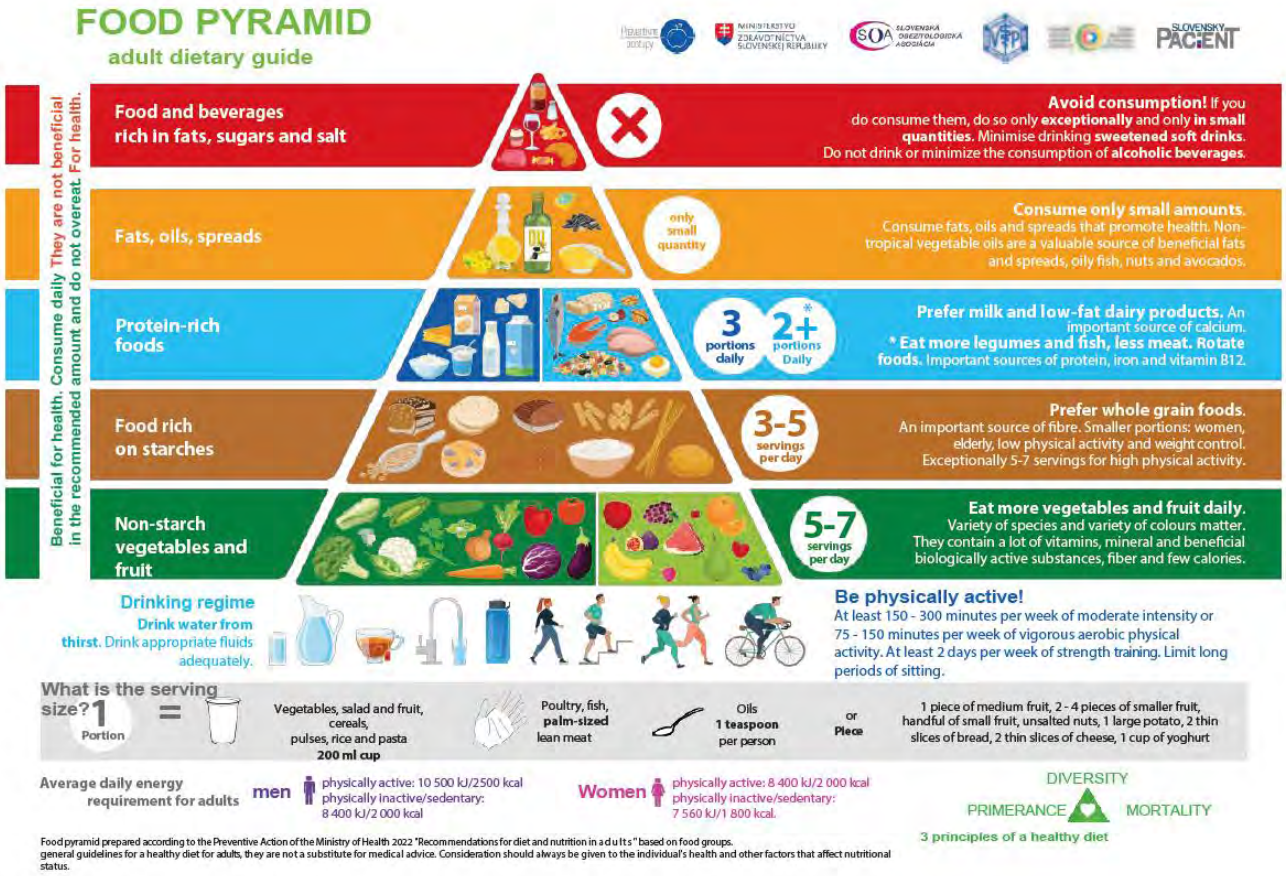


Image credit: https://www.health.belgium.be/en/advisory-report-9284-fbdg-2019

# Food pyramid Food plate

## Food pyramid / Food plate

- These are graphic models expressing written and illustrative advice and recommendations on good diet.
- The pyramids contain the floors of the individual food groups, in the case of the plates they are cutouts showing the proportions for each food group and their total consumption.
- Illustrative models serve as visual aids and include real or drawn examples of examples of each food group, usually with a brief description of the recommended portions for consumption.
- They are simple visual aids and pictorial guides to people's healthful diets.
- The aim is to provide both the professional and the general public with a simple and easy-to-remember manual on,
  - which types of food should be eaten daily, how often and in what proportions
  - in order to maintain a healthy diet,
  - health promotion and chronic disease prevention.




Source : https://www.health.gov.sk/?Postupy-Prevencia

# Food pyramid

## Example.

UK

VISUAL AID:

THE EATWELL GUIDE

2016


https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/

# Food groups

## All current dietary recommendations are based on:

- guidelines on individual food groups.

## Groups of foods that promote health, located

- in the different floors of the pyramid and belong there:
- vegetables, fruits, whole-grain starchy foods, protein-rich foods and
- some fats and oils.

## Food groups that have a negative impact on health,

- and the consumption of which is to be restricted, are in the graphic aids
- listed separately with reference to their negative impact on health,
- or are not included in these visual aids at all.
- This group includes foods rich in energy (calories), fat, added sugars and salt.
- Many popular processed foods belong to this group, including:
- Desserts, cakes, cookies, crackers, saltine crackers, potato chips, hamburgers, fried meat products, sweetened beverages, and many more.

# Portions

- In everyday life, portions of food and meals **are** usually determined by each person himself
- In recent decades, the serving portion sizes
  - in restaurants and homes

  has gradually increased.
- XXL packs are also very popular:
  - many foods with a better price,
  - than having the same food in smaller packages.
- A well-balanced and healthy diet is based on:
  - not only on the right choice of food, meals and drinks, but also on their appropriate quantity and on the appropriate frequency of their consumption.

| Food Groups | Standardised Portions<br>Use standardised utensil sizes (e.g. ladle sizes) |
|---|---|
| *Vegetables, salad and fruit<br>Provide 5 portions per day | 1 portion is equal to 80g<br>> 1 medium sized fruit – apple, orange, pear or banana<br>> 2 small fruits – plums, kiwi or mandarin oranges<br>> Small fruits – 6 strawberries, 10 grapes or 16 raspberries<br>> ½ cup of cooked vegetables – fresh or frozen<br>> 1 bowl of salad – lettuce, tomato, cucumber<br>> 1 bowl of homemade vegetable soup<br>> 150mls unsweetened fruit juice |
| *Cereals and breads, potatoes, pasta and rice<br>Provide 5 portions per day | 1 portion is equal to:<br>> 2 thin slices of white or wholemeal bread<br>> 1 torilla wrap<br>> 1 ½ slices wholemeal soda bread or 1 pitta pocket<br>> 40g dry porridge oats<br>> 45g flaked type breakfast cereal<br>> 125g cooked rice,<br>> 100g pasta, noodles, or cous cous<br>> 2 medium potatoes (200g) or 4 small potatoes |
| *Milk, yogurt and cheese<br>Provide 3 portions per day | 1 portion is equal to:<br>> 200mls milk<br>> 25g cheese<br>> 125g yogurt |

| Food Groups | Standardised Portions<br>Use standardised utensil sizes (e.g. ladle sizes) |
|---|---|
| Meat, poultry, fish, eggs and beans<br>To meet the nutrition standard for protein (90g per day), 35-42g protein must be provided per day from meat, fish, chicken, eggs and beans<br>Protein containing foods should be provided at 2-3 meals each day | Each of these foods provides 7g protein:<br>> 1 egg<br>> 25g roast chicken<br>> 22g roast beef<br>> 25g cooked roast pork<br>> 30g cooked minced beef<br>> 30g baked salmon<br>> 30g baked cod<br>> 100g cooked beans<br>These foods must be weighed after cooking to ensure that specified weight is given at each meal for example to provide 28g protein from roast chicken, cooked portion should weigh 100g |
| Foods and drinks high in fat, salt and sugar | Portions and types of foods used will be determined by the nutrition standards for the individual therapeutic and texture modified diets, see Section 4.0 and 5.0 |

*DOH, HEG, 2016.

# Ports

## Visual aids (pyramids, plates):

- They provide information and illustrations on the correct portion sizes of individual foods and are designed to help create a proper balance in your diet.
- They often also give the minimum and maximum recommended daily intakes of a given food groups,
  - minimum intake for vegetables and fruits,
  - maximum intake for foods high in sugar, salt, saturated fatty acids,
  - the frequency (frequency) of their intake is also recommended (consume daily, weekly, infrequently).

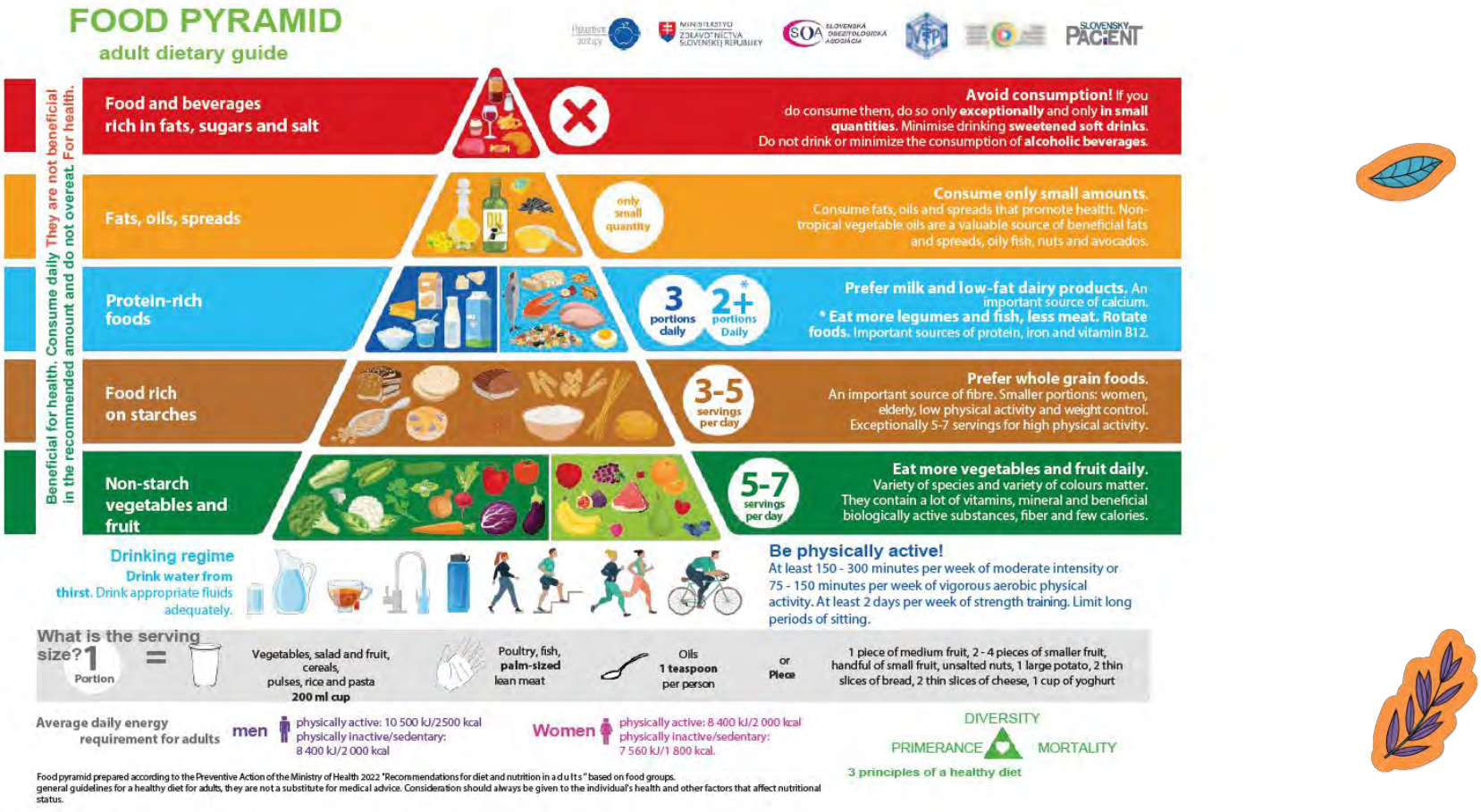
## Method of indicating portion sizes:

The recommended portion sizes for individual foods are given in two ways, namely:

- In units of measurement (e.g. grams, millilitres),
- Illustrative aids (handful, cup, palm, thumb, bowl),

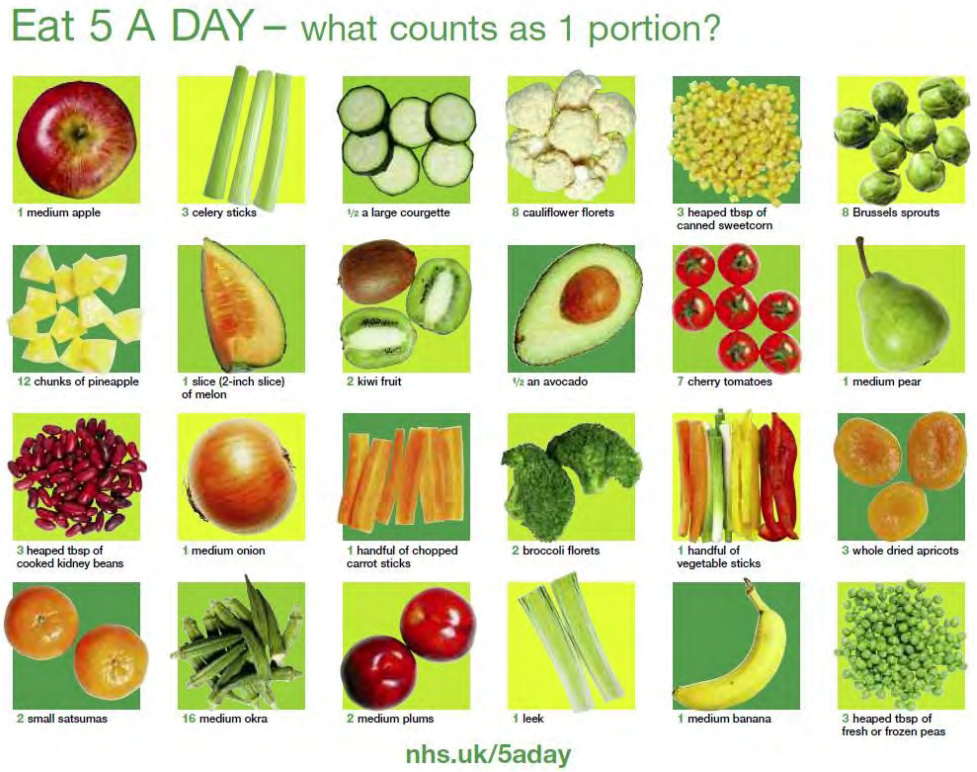
## Number of recommended servings for 1 day:

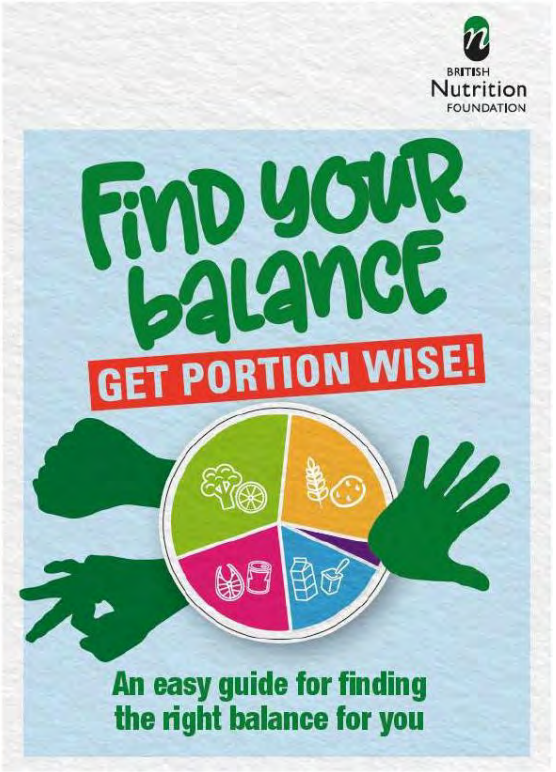
- The number of servings recommended for 1 day is also recommended:
  - i.e. how many portions of specific foods or food groups should be consumed in 1 day.

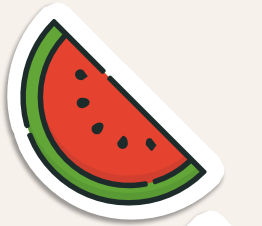
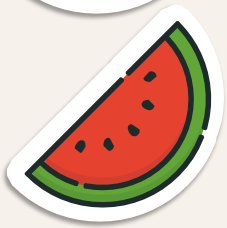
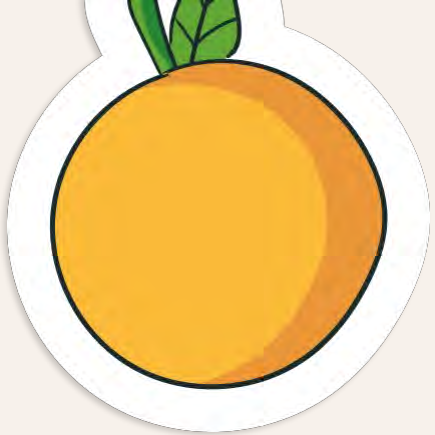



Source : https://www.health.gov.sk/?Postupy-Prevencia

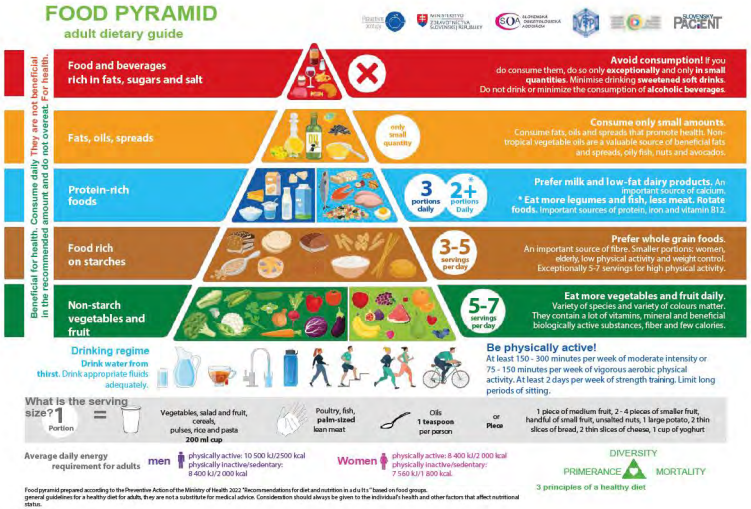
# Portions: units of measurement and illustrative aids




# 4
# Food and food groups
# Under scrutiny



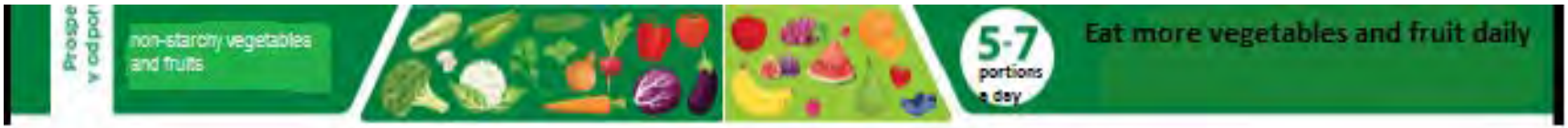

Source : https://www.health.gov.sk/?Postupy-Prevencia

# VEGETABLES AND FRUIT:

## FOODS RICH IN FIBRE, VITAMINS, MINERALS AND PHYTOCHEMICALS

**The first level of the food pyramid is reserved for vegetables and fruits.**

However, this group includes only so-called **non-starchy vegetables**, meaning vegetables that contain little or no starch. Therefore, typical types of starchy vegetables, such as potatoes, sweet potatoes, or corn, do not belong to this group.



# Vegetables: a staple of the daily diet

- Vegetables (along with fruit) are a staple of the daily diet. Vegetables and Fruit should make up at least one third of the daily diet.

- Vegetables have the fewest calories of all the food groups! To be more precise - vegetables have the lowest energy density of all food groups. Energy density is the amount of energy expressed in kJ or kcal in 100 g of food. For comparison, the energy density of a cucumber is 66 kJ = 16 kcal in 100 g, while the energy density of caraway bread is 1020 kJ = 244 kcal in 100 g and the energy density of Chabay sausage is 1970 kJ = 470 kcal in 100 g,

- Vegetables are rich in valuable vitamins, minerals and trace elements. In addition, all vegetables (root, leaf, fruit and onion) are a source of vegetable fibre.

# Vegetables: eat at least 5 servings of vegetables a day!

- **Eat at least 5 servings of non-starchy vegetables every day!**
  - **1** standard serving is **80 g of** vegetables.
  - **5** daily portions means eating **400 g of** vegetables.
  - **5** servings of vegetables is the **minimum amount** you should eat daily. Eating more is better.
- **You can eat the vegetables**:
  - as a **separate meal:** **150 - 200 grams of** mixed salad, or:
  - as a **side dish:** **50 - 100 grams**.
- **Always mix up your vegetables with a variety of different colours**.
  - Combine **at least three colors of** vegetables on your plate, such as orange carrots (beta-carotene), red tomatoes (lycopene), leafy salad greens (chlorophyll), etc.
  - Each colour means inj kind of vitamin or antioxidant. By combining plant micronutrients, their positive effects on your health are magnified.

Image credit: Freepik.com (by@macrovector)

# Vegetables: eat mostly raw vegetables!

- Vegetables should be eaten mostly raw.
  - Eating raw vegetables that retain their original nutrients in their entirety is ideal.
  - The heat treatment of vegetables results in greater or lesser loss of thermolabile nutrients - especially vitamins and minerals.
  - When cooking vegetables and fruits, give preference to boiling, steaming, stewing, baking.
  - Limit consumption of vegetables that have been cooked to contain lots of energy, fat and salt (fried vegetables, vegetable chips).
- Choose the most environmentally friendly cooking method.
  - At lower temperatures and for as short a time as possible.
  - Steaming vegetables is the ideal and most gentle way to prepare them.
  - Steamed vegetables have most of their original substances, which can be seen in the preserved fresh colour of vegetables prepared in this way. We therefore recommend that you have a steamer at home.
- Do not cook vegetables in fat.
  - Do not dry or frit!
  - You can add a little fat at the end of cooking: for example 3-5 g of olive oil or rapeseed oil.

Image credit: Freepik.com (by@macrovector)

# Vegetables:

**Eat canned vegetables only occasionally!**

- Canned vegetables are consumed occasionally,
  - Prefer one that is low in salt and fat.

    If you eat sterilised vegetables, do not add salt to them.
  - Keep an eye on the salt content of the sterilised vegetable products you buy.
- Consumption of table salt/NaCl for the whole day should not be greater than 5 g.
- You can consume both pureed vegetables and vegetable smoothies interchangeably, or you can also prepare a combined vegetable-fruit smoothie.
  - When buying products, watch out for added salt and sugar!
  - Choose products with low salt and no added sugar!
- Vegetable juices should be consumed occasionally, as they usually have less fibre and may contain added salt.

Image credit: Freepik.com (by@macrovector)

# Fruit:

## ovocie je základnou zložkou každodennej stravy!

- Fruit is an essential component of the daily diet.
- Fruit **a Vegetables are important part of a healthy balanced diet,**

- excellent sources of important micronutrients (vitamins, minerals, and trace substances), fibre and plant nutrients (phytonutrients, phytochemicals), especially antioxidants.

- Fruits and vegetables should make up at least one third of the daily diet.
- Fruits (together with vegetables) form a group of plant foods with low (fruits) and very low (vegetables) energy content.

— This is mainly due to the low fat content and the high proportion of waters. Fruits (as well as vegetables) do not contain salt or cholesterol.

— Fruits, unlike vegetables, contain a higher content of simple sugars (monosaccharides), especially fructose (fruit sugar) and glucose.

— The natural fructose content of fruit (including honey), as opposed to commercial products low

— Higher fructose content is found in sweet fruits such as apples, melon,mangoes

Image credit: Freepik.com (by @freepik)

# Fruit: source of vitamins, minerals and fiber

- Fruit (like vegetables) is also an excellent source of essential nutrients such as vitamins and minerals.
  - ESSENTIAL means that we have to take them from the diet, because the body cannot produce them on its own as part of its own metabolism.
  - These are mainly vitamin C (citrus fruits, berries, strawberries, rose hips, green peppers, tomatoes, potatoes, broccoli, garlic), vitamin E (carrots, cabbage, blackberries, avocados), provitamin A, or beta-carotene (carrots, apricots, red melon and other orange, yellow and green varieties) and folate/active form of vitamin B9, or folic acid (spinach, lettuce, broccoli, citrus fruits, papaya);
  - MINERALS e.g. potassium (tomatoes, bananas), magnesium (bananas, artichokes, berries), phosphorus and calcium (broccoli, lettuce, cabbage).
- Fruit (like vegetables) is an important source of plant fibre.
  - FIBRE refers to all non-digestible parts of plant origin based mainly on polysaccharides.
  - The processing of fruit and vegetables can affect their fibre content.
  - Removing the skins from fruit reduces the fibre content, while removing the water, e.g. by cooking, increases the fibre content.
  - When processing fruit and vegetables, methods should be used that preserve, ideally increase, the fibre content.
- Every fruit (and vegetable too) contains a rich mixture of biologically active substances.
  - PHYTOCHEMICAL SUBSTANCES, PHYTONUTRIENTS are plant nutrients with beneficial effects reducing the risk of chronic diseases.
  - Phytonutrients are natural plant substances of a non-vitamin nature, which chemically form a very diverse and numerous a group of substances, e.g. 'carotenoids' such as lycopene or beta carotene; 'polyphenols' such as carotenoids, quercetin resveratrol.

## The nutritional composition of both fruits and vegetables depends on:

- of a particular species and variety,
- the environment where it grows up,
- agricultural, production and storage conditions,
- exposure to the sun's rays,
- soil quality, farming practices, time of harvest, ripeness at harvest,
- the length of time between harvest and consumption,
- methods of preservation, preparation and transport.

## Organic vegetables and organic fruits, respectively organic vegetables and organic

# Fruits:

- are those vegetables and fruit that meet the specified requirements, which include:
- limiting the use of synthetic pesticides,
- a ban on the use of genetically modified species,
- adapting crops to the location,
- selection of pest-resistant crops, etc.

## Organic food may exhibit:

- lower levels of toxic metabolites (heavy metals, cadmium),
- lower residues - residues, synthetic fertilizers and pesticides,
- in the case of meat, antibiotics.

Current knowledge does not allow a definitive statement on the health benefits of consuming organic food.

# A varied selection of fruits and vegetables:
# ensures sufficient intake of fiber, vitamins, minerals and other useful phytonutrients

- All fruits and vegetables are sources of:
  - **fibre** and a wide range of **vitamins**, **minerals** and
  - other **biologically active substances** (phytonutrients, phytochemicals).

- The beneficial effects of fruit and vegetable consumption on human health can be achieved:
  - by eating **sufficient** and **varied** amounts of **fruit** and **vegetables**,
  - as well as **overall eating habits**,
  - NOT by focusing on the consumption of individual nutrients or biologically beneficial substances.

Images courtesy of Freepik.com

- Meals and foods that include vegetables and fruit:
  - e.g. fruit cake, fruit yoghurt, vegetable pizza:
  - **do not belong to the food groups vegetables and fruit** and
  - **are not included** in the recommendations for vegetable and fruit consumption.

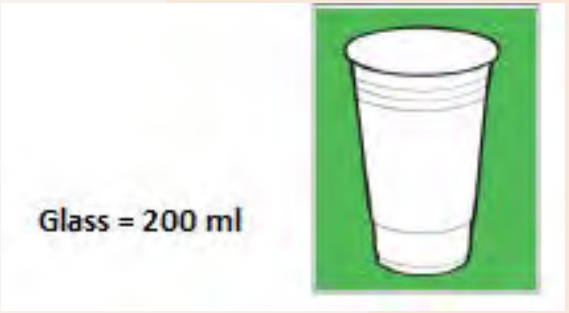
- Eat canned fruit occasionally:
  - and **give preference to** such forms that
  - **is low** in **added sugars**.

- Eat dried fruit:
  - only **occasionally** and in **small quantities**.


Image credit: Freepik.com - by @macrovector

# Vegetables and fruits: remember!

- Vegetables and fruits are the foundation of daily nutrition. They should make up at least one-third of the total diet.
- It is important to eat a variety of colorful fruits (this also applies to vegetables).
- Every day, consume at least 5 portions of non-starchy vegetables and 2 portions of fruit.
- Vegetables should be consumed more than fruit. A portion of fruit does not replace a portion of vegetables.
- **One standard portion of vegetables is 80 grams.**
- **One standard portion of fruit is 150 grams.**
- **The recommended daily consumption of vegetables is 400 grams.**
- **The recommended daily consumption of fruit is 300 grams.**
- **A maximum of one of the recommended 5 portions of vegetables and 2 portions of fruit per day can be in the form of:**
  - ¾ cup (150 ml) of unsweetened fruit juice or 100% juice
  - ½ cup (130 ml) of fruit or vegetable smoothie
  - ½ cup (30 g) of dried fruit




EAT VEGETABLES AND FRUIT DAILY. EAT MORE VEGETABLES THAN FRUIT.

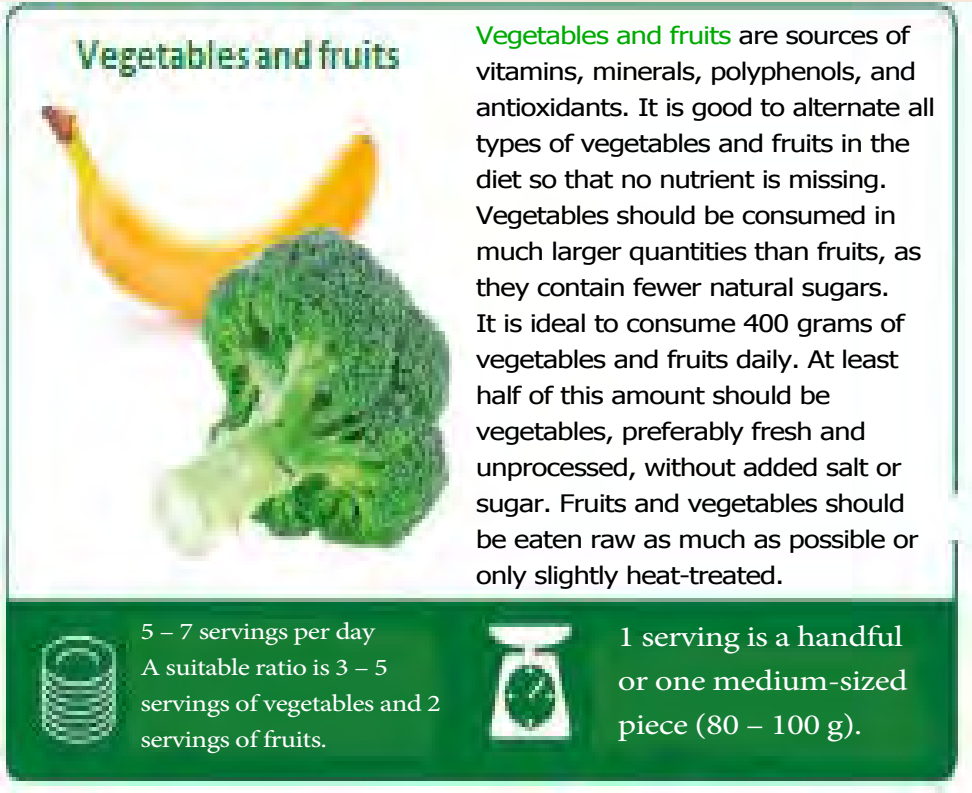
A PORTION OF FRUIT DOES NOT REPLACE A PORTION OF VEGETABLES. MORE IS BETTER.

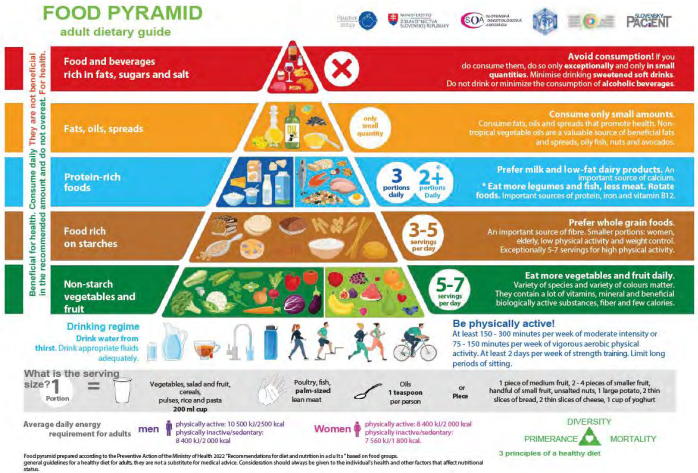
# Vegetables and fruits: remember!

**It is recommended to consume:**
**5 portions of non-starchy vegetables daily and**
**2 portions of fruit daily**

**One standard portion of vegetables (80 grams) and fruit (150 grams) is:**

- ½ cup of raw, cooked, frozen, or canned vegetables (e.g., carrot, parsley, broccoli, cauliflower, asparagus, cabbage, kale, Brussels sprouts, green peas, zucchini, eggplant)
- cup of leafy vegetables (e.g., lettuce, arugula, spinach, tomato, cucumber, legumes, bean pods, radishes)
- 1 large piece of fruit (e.g., melon, pineapple).
- 1 medium-sized fruit (e.g., apple, pear, banana, orange, peach)
- 2-3 smaller fruits (e.g., mandarin, plum, kiwi)
- 5-15 pieces of small fruit (about a handful) (e.g., grapes, cherries)
- ½ cup of berries (e.g., raspberries, currants)






Source : https://www.health.gov.sk/?Postupy-Prevencia

# FOODS RICH FOR THE GROWTH:

## WHOLE GRASS BREAD, CEREALS, CEREALS, RICE AND EARTHS

The second level of the food pyramid is reserved for starchy foods, including wheat, potatoes, rice, wholegrain cereals, refined grains, starchy vegetables (sweet potatoes, potatoes, corn).

# Starchy foods

## Cereals include:

— **bread**, **pastries**, **pasta**, **breakfast cereals**, **cereal flakes** and **other bakery** products with a high content of cereal flour (wheat, rye, oats, corn, rice, buckwheat).

— in the case of cereal foods, foods from **both wholemeal flour** and **refined flour**.

## Starchy foods do not include:

— **foods containing cereal flours** that **are high in fat, saturates, trans-fatty acids, sugars and/or salt:**

— e.g. cakes, buns, muffins, biscuits, cookies, biscuits, scones.

— **legumes** rich in starch, fibre and protein / due to their high protein content they belong to the group of protein foods of non-dairy origin


Image credit: Freepik.com - by @macrovector

# Starchy foods

- **Starchy foods are a natural part of a good diet and a healthy diet for everyone.**
  - **it is recommended to eat** bread, pastries, rice, pasta,
  - Flakes, potatoes and other starchy foods.
- **It is recommended to prefer whole grain cereal foods over cereal foods made from refined flour.**
  - **These include**, in particular**,** wholemeal bread and wholemeal pastries, crispbreads (Knäckebrot), wholemeal pasta, wholemeal, brown or wild rice, oatmeal or other cereal flakes, unsweetened muesli.
- **Wholegrain cereal foods contain more fibre**
  - **as white** or **refined** cereal foods
  - often contain **more of other nutrients** (e.g. B vitamins).


Image credit: Freepik.com - by @macrovector

# Starchy foods

- **Whole grain foods are a good source of fibre,**
  " which should **account for** up to **half of the cereal foods consumed**.
  " **another source** is also GREENS, FESTS AND INGREDIENTS.
  "The recommended amount for daily fibre intake is **at least 30g** for both men and women (can be **35 - 45g**). "
  eating **whole grain** cereal foods **reduces the risk of** type 2 diabetes, cardiovascular disease and colorectal cancer.

- **The number of recommended servings of starchy foods per day is**:
  " **3 - 5 standard portions** for adults, both men and women.
  " **6 - 7 standard portions** for physically active younger adults, especially men.


Image credit: Freepik.com - by @macrovector

# Starchy Foods

# Recommended Servings

## Recommended serving sizes for starchy foods:

(cereals, potatoes and rice) are as follows:

- 2 thin slices of whole grain bread or pastry (1 slice = 40 g)
- ½ cup of dry oats or unsweetened cereals
- 1 cup (~ 200 ml) of cooked rice, pasta, or grains (bulgur, couscous, polenta, quinoa)
- 1 cup of cooked grain porridge or cornflakes
- ½ cup of corn (kernels)
- 2 medium or 4 small potatoes or 1 cup of sweet potatoes

## One standard portion of food rich in starch:

— should have an energy content:

— approximately **630 kJ/150 kcal**

## As an aid for finding portion sizes

— starchy f o o d s :

— you can also use the following image:


Picture. Food and nutritional literacy. Dr. Josef Raabe Slovakia. 2021

# Starchy foods: remember!

- **In the case of breakfast cereals and ready-made grain porridges, it is important to check the nutritional composition on the packaging (they may differ due to varying amounts of added sugars and fats).**

- **In the case of bakery products (bread, pastries), choose those that contain less salt.**

- **When cooking starchy vegetables, limit frying and deep-frying and minimize the use of fats.**

- **If starchy foods are consumed as a side dish with the main meal, it is very important to follow the recommended standard portion. The starchy side dish should not be larger than ¼ of the plate. It is advisable to replace part of the starchy side dish with vegetables.**

Image credit: Freepik.com - by @macrovector

# Cereals: the cereal ear - the composition of the grain!

## Composition of Whole Grain

A whole grain contains all three parts:

- **Bran**: Outer layer rich in fiber
- **Endosperm**: Middle part rich in energy
- **Germ**: Inner part rich in nutrients

When the grain is milled or refined, the bran and germ are removed, leaving only the endosperm.

If you eat a varied diet that includes whole grains, you receive nutrients from the entire grain, including protective phytochemicals, vitamins, minerals, fats, and fiber.

| Component | Carbohydrates (g) | Proteins (g) | Fats (g) | Fiber (g) | Iron (% RDI) | Vitamin B |
|---|---|---|---|---|---|---|
| Bran | 63 | 16 | 3 | 47 | 59 | Vitamin $B_5$ |
| Endosperm | 79 | 7 | 1 | 4 | 7 | - |
| Germ | 52 | 23 | 10 | 14 | 37 | Vitamin $B_6$, Omega-3 fatty acids, Omega-6 fatty acids |



Images courtesy of Freepik.com - by @macrovector

Figure: Minárik P, Mináriková D. Cancer and life. Facts and myths. CONTACT, 2013. Image taken from: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. Let's try it differently! Dr. Josef Raabe Slovakia, 2021

# Potatoes: Nutritional composition of potato tubers

**Potato**

(A cross between a starchy food and a vegetable, **it is naturally nutritious** and beneficial.)

**Nutritional composition of potato per 100 g**

- Rich in:
  - Starch
  - Fiber
  - Vitamins
  - Minerals
  - Also contains essential amino acids and phytonutrients
- Water: 80%
- Energy: 85 kcal
- Starch: 15%
- Sugars: < 0.5%
- Lipids: 0.1%
- Fiber: 2%
- Proteins: 2%
- Vitamin C: 13 mg
- Iron: 0.31 mg
- Phosphorus: 44 mg
- Calcium: 5 mg
- Potassium: 350 mg

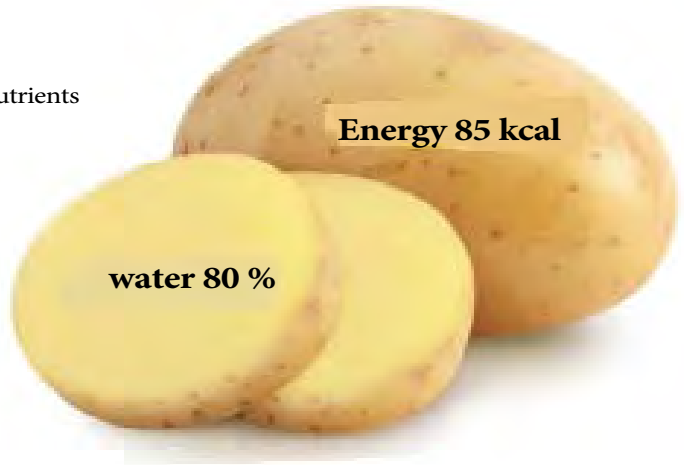



Figure: **Nutritional composition of potatoes**
Source: Minárik P, Mináriková D. Cancer and life. Facts and myths. KONTAKT, 2013. Image taken from: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. Let's try it differently! Dr. Josef Raabe Slovakia, 2021

# Potatoes: What is good to know about potatoes?

**Potatoes support health, even as part of a weight-loss diet. Potatoes have an excellent nutritional composition, and when consumed in moderation and prepared properly, they contribute to the consumer's health (boiled potatoes – yes, potato chips – no).**

**Potatoes have a high water content, and after cooking, they have a low energy density, making them filling without contributing to obesity or diabetes.**

**Due to their high content of vitamin C (which is preserved with gentle preparation such as steaming), B vitamins, minerals, and trace elements, as well as soluble fiber, potatoes can be classified, when properly prepared, among plant-based starchy foods that promote consumer health.**

**If potatoes are prepared in a healthy way (steamed, boiled, baked without added fat) and consumed in moderate amounts (75 – 100 g, max. up to 150 g) as part of a varied and balanced diet ("healthy plate," "well-balanced plate"), they are always a suitable starchy side dish.**

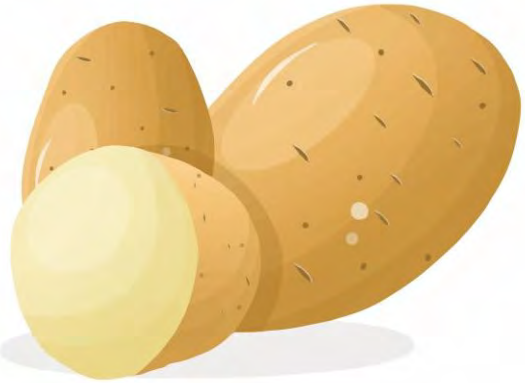


Image credit: Freepik.com - by @BayuGondrong

# Semaphore of cereal foods and starch supplements

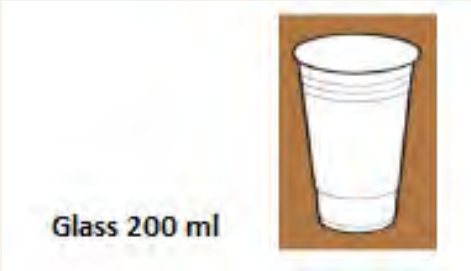
| Category | Most Suitable Foods (Consume daily or several times a week) | Suitable Foods (Consume max. 1-2 times a week) | Least Suitable Foods (Avoid or consume minimally) |
|---|---|---|---|
| **Bread, Pastries** | Whole grain bread, e.g., sourdough or rye bread, Knäckebrot, Rye bread, Crisp whole grain bread | Multigrain pastries, Extruded bread without coating | White pastries, White bread, Extruded bread with coating |
| **Sweet Pastries** | - | Brioche, Christmas bread, Poppy seed roll, Sponge cake, Gingerbread, Curd cakes, Strudel | Fornetti, Croissants, Muffins, Pastries made from puff pastry, Waffles, Linzer cookies |
| **Breakfast Cereals** | Natural, unsweetened oatmeal, Bran, Whole grain unsweetened flakes | Poured flavored muesli (e.g., with dried fruit and seeds) | Children's cereals, Sweetened and flavored cereals, Cornflakes, Baked muesli, Muesli bars, Semolina porridge |

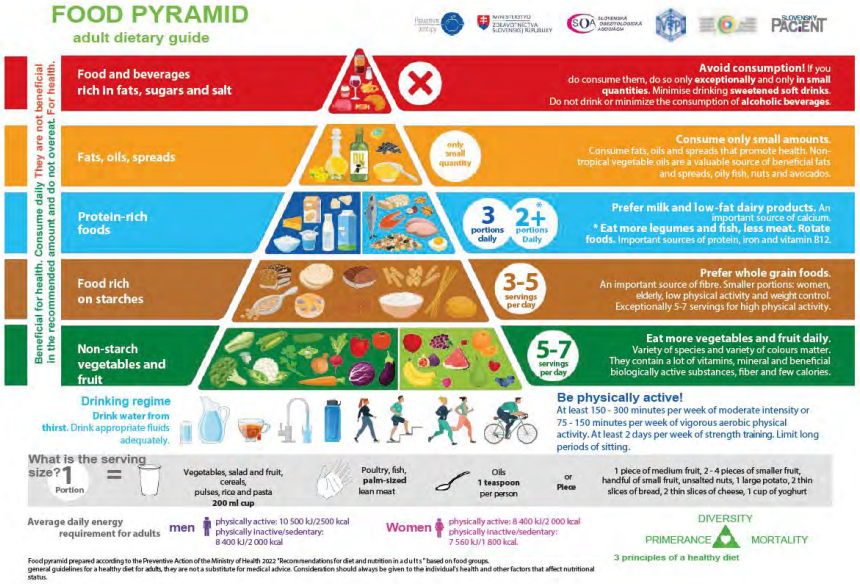
Figure: Minárik P, Mináriková D. Cancer and life. Facts and myths. CONTACT, 2013. Image taken from: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. Let's try it differently! Dr. Josef Raabe Slovakia, 2021

# Starch attachments, recommended portions:

**You should consume 3 – 5 servings of starchy foods per day.**
**The number of servings varies depending on gender (fewer servings are sufficient for women, physically inactive people, older individuals, or those aiming to reduce body weight). For physically active younger adults, especially men, up to 6 – 7 servings per day are exceptionally recommended.**

**One standard serving of starchy foods is:**
**2 thin slices of whole grain bread or pastry (1 slice = 40 g)**
**½ cup of dry oats or unsweetened cereals**
**1 cup (≈ 200 ml) of cooked rice, pasta, or grains (bulgur, couscous, polenta, quinoa)**
**1 cup of cooked grain porridge or cornflakes**
**½ cup of corn (kernels)**
**2 medium or 4 small potatoes or 1 cup of sweet potatoes**






Source : https://www.health.gov.sk/?Postupy-Prevencia

# FOODS RICH IN PROTEINS: MILK, MILK PRODUCTS, CHEESES PLANT BASED MILK REPLACEMENTS

**The third level of the food pyramid belongs to protein-rich foods,** which include milk, dairy products, cheese, and plant-based milk alternatives.

# Milk and Dairies natural animal product:

- **Milk and dairy products are an important part of the diet** in many parts of the world, including Slovakia.
- **The role of milk** is above all to provide **all the nutritional requirements of newborn mammalian young** during the period of most intensive **growth**, because it contains in sufficient concentrations **a complete range of essential nutrients** in **easily digestible** forms.
- **The term 'milk' is commonly understood to mean cow's milk**. In our environment**, sheep's** or **goat's** milk and milk products made from it are also sometimes consumed.
- **Milk is not only a common food, but also has a much broader health and social significance**.
- **Definition of milk**: milk is a **white colloidal suspension secreted by the mammary gland of mammals**. It is a natural **animal product** which is directly used **for consumption without further additives**. Primary milk production is also a major **economic** resource and has deeper **ecological** and **social benefits** for our **countryside**. Most important, however, is the **health** benefit of milk and dairy products for people.

# Milk and Dairies, milk pasteurization:

**According to the heat treatment, and therefore also according to the shelf life of the finished products, we distinguish**:

- **PASTERIZED MILK** (referred to as "**fresh**") is usually **treated with high pasteurization**, sometimes also **with gentle pasteurization** in the case of high quality raw material. For storage and distribution, a refrigeration regime is essential, usually a temperature between **4 - 6 °C**. The milk usually has a **shelf life** of between **10 and 20 days**. Pasteurisation safely **destroys 99,9 % of all micro-organisms** present in raw milk, except bacterial ~~spores~~.
- **DURABLE MILK** (referred to as **UHT milk**) is **highly heat-treated**, which inactivates all microorganisms present, including spores, and most enzymes. Either in-pack sterilisation (at **115-120 °C** for **20-30 minutes**) or out-of-pack heat treatment (*Ultra-High Temperature*, *UHT*), which is a continuous heating to **135-150 °C** (with a dwell time **of a few seconds**) followed by aseptic filling, is used for treatment. Storage and distribution of these milks is possible at **room temperature** and shelf life is usually extended to **4-5 months**. **After opening, storage in a refrigerator** is necessary.
- **MILK WITH EXTENDED DURABILITY** refers to the application of **temperatures higher than pasteurization temperatures** but **lower than UHT** treatment. **The taste of** such milk **is not adversely affected** and is similar in taste to fresh, pasteurised milk. However, **the shelf-life** is **longer**, namely **20-40 days in cold storage**.
- **UNHEAT-TREATED MILK** (freshly milked, raw) may **contain micro-organisms** which **must be destroyed by boiling**. Heat-treated milk is microbially safe and contains no micro-organisms.

# Milk and dairies fermented milk products:

## Acid-alkaline products

- **In sour-milk products, part of the milk sugar (lactose) has been converted into lactic acid by lactic acid bacteria** and t h e protein has been precipitated by the reduced acidity.
- This process is called **fermentation** and allows the **extension of the shelf life of** the products by biological preservation.
- Depending on the raw material used, the type of bacterial cultures, possibly other additives and technological steps, sour milk products can be divided into **yoghurts** and **yoghurt products**, **sour (acidophilic) milks** and **sour creams**.
- **Kefir** and **kefir milk** are fermented milk products of Asian **origin** with bacteria and yeasts. They are produced using starter **cultures** obtained directly from the so-called **kefir grains**.


Image credit: Freepik.com - by @macrovector

# Milk and dairies butter concentrated milk fat:

## Butter

- **Butter is a concentrated milk fat made from cow's milk** so that the fat forms a continuous phase in which water is finely dispersed.
- It is therefore **an emulsion of milk plasma** (aqueous phase) **in milk fat**.

**Mark"butter"** can bear only in the product, which contains at least 80 % but less than 90 % **milk fat**

- **Spreadable butter** is a **butter-like** product used as a spread but also as an ingredient in the manufacture of other food products. It has a minimum **fat content of 31 %**, a minimum dry matter content of 42 % and a water content of up to 58 %.

Image credit: Freepik.com

# Milk and Dairies cheese and and curds:

- **Almost the entire range of cheeses** can be made **from different types of milk**. Cheese made from **cow's**, **sheep's** or **goat's** milk may be placed on the market in Slovakia.
- **Cheeses made from milk other than cow's milk** must **state** this on the packaging of the cheese.
- **Cheeses made by the acid method** (using dairy micro-organisms) are produced **Sour cheeses**, which include most cottage cheeses and Olomouc tvarůžky.
- **Sweet cheeses are produced by the sweet process** (precipitation of proteins with rennet enzymes) to obtain **SWEET CHEESES**, which include **soft cheeses that are not ripened** (rennet, fresh cream cheese, cottage cheese, mascarpone), **soft cheeses that are thermised**, **soft cheeses that are ripened** or ripened by freezing, r e f r i g e r a t i o n , or in brine (e.g., Balkan cheese, feta cheese).
- A special group are the **mould cheeses**. This is a group of **soft** and **semi-hard** cheeses in which, in addition to the normal microflora, **special cultures of moulds** are involved in the ripening process. This includes cheeses with **white mould on the surface** (camembert, ermine, brie), with **blue mould inside** (niva, roquefort, gorgonzola) or with a **combined mould**.

Image credit: Freepik.com - by @upklyak

# Milk and **DAIRIES,** sheep cheese (bryndza) and rolled smoked cheese (parenica)

- **sheep cheese and rolled smoked cheese** :
  - is one of the **traditional Slovak cheese products** and
  - has the **status of a protected product**.
- ***Bryndza*** is a specific natural cheese:
  - made from **sheep's milk** cheese, or
  - from a mixture of **sheep's and cow's milk** cheeses,
  - while the proportion of sheep's milk cheese must be on a dry matter basis of bryndza **exceeding 50 % by weight**.
- Basic raw material:
  - for the production of bryndza is **sheep's cheese**.
- Unpasteurised ***bryndza***:

  - is a rich **source of lactic bacteria and yeasts**.

Image credit: https://bibisgrocery.com/obchod/bryndza-liptov-100g/

# Milk and dairies, plant-based milk substitutes:

- **Dairy product** means a product made **exclusively from milk**.
- **The alternative plant (non)dairy product** is usually milk fat replaced by **vegetable fat**. These are mainly so-called **analogues of dairy drinks** and **yoghurts based on plant ingredients**.
- **The main reasons for the popularity of plant-based alternatives** are:

  - Food intolerances and allergies
  - Reducing greenhouse gas production - carbon footprint
  - Global water challenges and the quest for the most efficient use of water
  - Soil erosion due to livestock production
  - Lifestyle of the younger generation in particular
  - Fashion
  - Harnessing the nutritional benefits of plant-based alternatives

- **Soy beverages are available, as well as coconut, oat, rice, almond,** and more. The contents of individual nutrients in vegetable beverages **vary** according to the type of beverage and the producer. Their composition is also highly **variable**. **Fortified herbal beverages** often appear on the market which are enriched with B vitamins (B2, B12), vitamin D or calcium (note: '**fortification**' = enrichment).

Image credit: Freepik.com - by @macrovector

Basic Nutritional Properties of Milk and Dairy Products

**Milk Proteins:** From a nutritional perspective, 1 liter of cow's, goat's, or sheep's milk contains a protein amount that roughly covers the recommended daily intake for children and about half of the recommended daily intake for adults. Milk proteins contain 18 out of 22 essential amino acids necessary for building and maintaining the human body. This makes them a source of essential amino acids, which the body cannot synthesize on its own and must obtain from food. The average protein content in cow's milk is about 32 grams per liter, in goat's milk approximately the same, and in sheep's milk 50 grams per liter. Proteins are also crucial for the biological utilization of minerals in milk and their absorption.

**Milk Carbohydrates:** The primary carbohydrate in milk is lactose, which is an essential sugar in dairy. Lactose improves calcium absorption and supports the development of beneficial intestinal microflora. It does not cause rapid blood sugar spikes and is an essential source of energy. Lactose enhances the absorption of magnesium and zinc, which are important minerals for bodily functions. However, some individuals may experience lactose intolerance, meaning their body cannot properly digest lactose, leading to digestive discomfort.

**Milk Fats:** Milk fats are easily digestible and serve as an energy source. They enhance the absorption of fat-soluble vitamins such as vitamins A, D, E, and K. Whole milk contains about 3.5% fat, while low-fat milk has between 0.5% and 3.5% fat. These fats also contribute to the flavor and texture of dairy products.

**Milk Vitamins:** Milk is a good source of vitamins A and E, which act as antioxidants and support immune function. It is also a source of vitamin D, which plays a crucial role in calcium absorption and bone health. Additionally, milk contains B vitamins, especially vitamin B2 (riboflavin) and vitamin B12, which are essential for metabolic processes and nerve function. The heat treatment of milk reduces its vitamin content; pasteurization can lower the amount of vitamin C and B vitamins by up to 10%.

**Milk has long been an essential part of a child's diet. I**t is a good source of energy and protein and contains a wide range of vitamins and minerals. Milk and dairy products are rich sources of **calcium**, which is necessary for bone and tooth development, as well as for proper nerve and muscle function. Milk and dairy products such as yogurt provide the most easily absorbable form of calcium, enriched with vitamin D. A sufficient intake of calcium also comes from leafy green vegetables, nuts, and legumes, but dairy remains a key dietary source of this mineral.

For some people, consuming milk and dairy products is not suitable. Some individuals suffer from lactose intolerance, meaning their body cannot properly digest lactose, leading to digestive discomfort. However, fermented dairy products such as yogurt and cheese usually cause fewer problems because they contain less lactose.

Studies suggest that consuming three servings of dairy per day is beneficial for maintaining bone health and meeting calcium requirements. Milk and dairy products provide high-quality protein, essential for overall health. Dairy products reduce the risk of colon and rectal cancer.

# Milk Dairies AND HEALTH

# Milk, diaries and plant substitutes: standard recommendations

For a healthy population, the following recommendations apply for the consumption of milk, dairy products and plant-based milk substitutes:

Prefer milk and dairy products with low fat content and fermented (sour-milk) products.

It is recommended to consume 2–3 servings of milk and/or dairy products daily.

A higher intake (3 servings) is recommended for adolescents. Regular consumption of milk and dairy products is particularly important for women and the elderly. People who cannot or do not want to consume milk and dairy products of animal origin should ensure an adequate intake of calcium from other sources, such as leafy greens, legumes, nuts, sardines, or plant-based milk substitutes enriched with calcium.

One standard serving of milk, dairy products, and plant-based milk substitutes is:

- Milk: 1 glass (200 ml) of drinking milk, sour milk, or fortified soy drink.
- Yogurt: 1 cup (125–150 g), ideally plain, natural, and without added sugars.
- Curd, cottage cheese: 1/3 – 1/2 of a package (75–125 g).
- Cheese: An amount equivalent to 2 fingers (25 g).

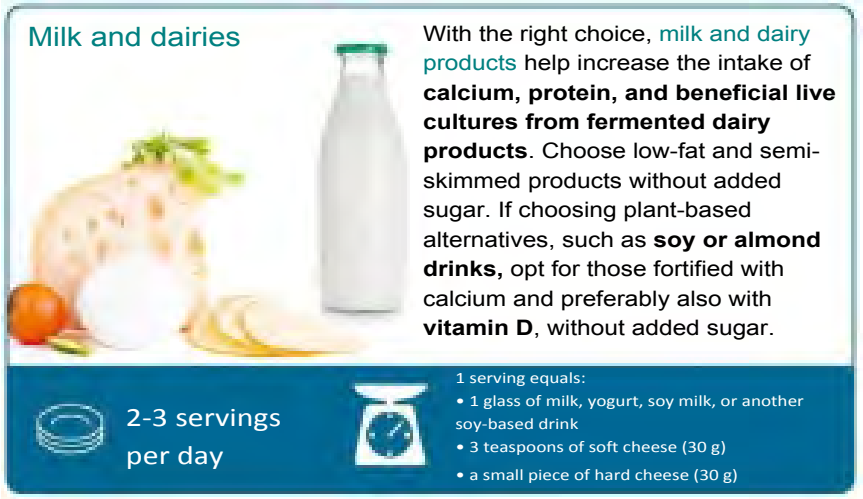




Figure: Minárik P, Mináriková D. Cancer and life. Facts and myths. CONTACT, 2013. Image taken from: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. Let's try it differently! Dr. Josef Raabe Slovakia, 2021

# Milk, dairy products and plant-based alternatives: Remember!

**Milk and dairy products are an important source of calcium and protein.**
Adequate calcium intake from other dietary sources is harder to achieve.

**Milk and dairy products should be consumed daily.**

Prefer milk and dairy products with reduced or low fat content.

**Low-fat milk, low-fat yogurt, and low-fat dairy products (other than cheese)** should be consumed more frequently.
**Cheese should be consumed in smaller amounts.**

Fermented dairy products **(yogurt, kefir, sour milk)** with low fat content should be consumed regularly.
Flavored forms should be consumed sparingly, and products with minimal added sugar should be preferred.

**The recommended number of servings for a healthy adult population is 2–3 servings per day.**
Note: Children and adolescents (ages 5–9, 10–18) should consume up to 5 servings per day. Sufficient and regular consumption is also important for seniors and women.

**One standard serving is:**
**Drinking milk**, sour milk, fortified soy drink: 1 serving = 200 ml (max. 250 ml). Example: a glass of milk = 200 ml, 250 ml.

**Yogurt:** 1 serving = 125 – 150 g (plain, natural, without added sugar). Example: 1 yogurt cup = 125 g, natural without sugar 150 g.

**Curd, cottage cheese: 1 serving** = 75 – 125 g. Example: cottage cheese cup, standard package of curd for 250 g, a serving is approximately 1/3 – 1/2 of the package.

**Cheese:** 1 serving = 25 g (15 – 30 g). Example: an amount equivalent to 2 fingers = 25 g.

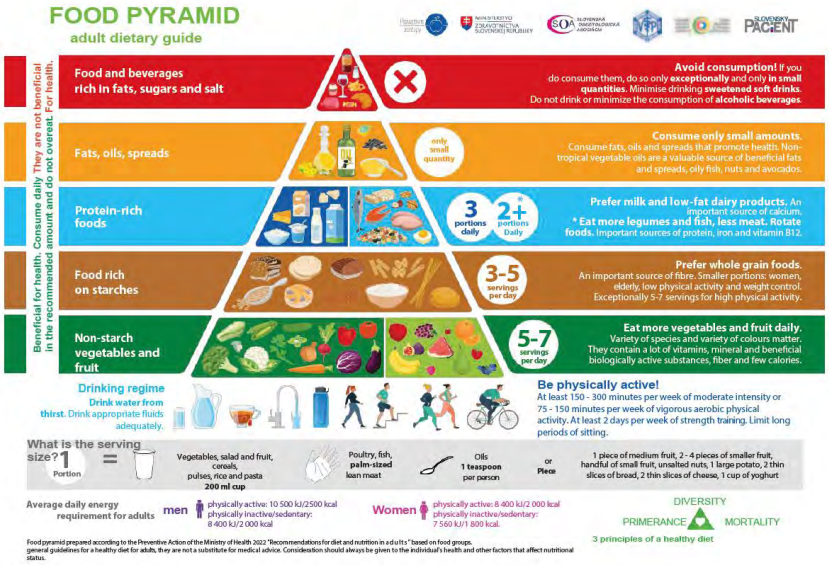
**Hard cheeses with high fat content should be consumed in small amounts.**

**Dairy products with high fat and sugar content** should be consumed occasionally as a dessert, not as a regular dairy food source.

**As part of a healthy diet,** 2–3 servings of milk and dairy products or their plant-based alternatives should be included daily.

**For a vegetarian diet, at least 3 servings of dairy products should be consumed daily.**

The only suitable plant-based milk alternative is fortified soy drink (enriched with calcium and vitamin D, with at least 100 mg of calcium per 100 ml of drink).




Source : https://www.health.gov.sk/?Postupy-Prevencia

# FOODS RICH IN PROTEIN: MEAT, FISH, FOODS, VEGETABLE INGREDIENTS, NUTS, SEEDS

The third tier of the food pyramid is protein-rich foods, which includes meat, fish, eggs, legumes (especially beans) and nuts, in addition to milk, dairy products, cheese and plant-based milk substitutes.

# Meat, fish, poultry, eggs, legumes, nuts, seeds: general knowledge

**Proteins are obtained from both animal and plant-based foods.**

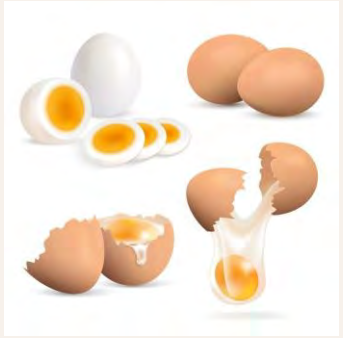
**Everyone needs to eat protein-rich foods daily, but it is not necessary to consume them in large amounts.**

**Eat a variety of protein-rich foods and alternate their consumption.**

**It is better to eat more legumes and fish, and less meat.**

**Alternate foods from this protein group.**

**It is recommended to eat 2 servings daily from this protein food group.**

# Meat, fish, poultry, eggs, legumes, nuts, seeds: foods rich in quality protein

**All foods in this group are rich in high-quality proteins –** similar to milk and dairy products. In addition to proteins, foods in this group also contain other beneficial nutrients, **such as iron, iodine, and vitamin B12**. These foods do not need to be consumed in large amounts, yet they provide good satiety. It is much more important to alternate them and consume more legumes, fish, and nuts, while reducing meat intake.

Foods containing plant-based proteins include legumes (soy, beans, peas, lentils, broad beans, chickpeas, etc.), grains and grain products, nuts, and plant seeds.

Foods containing animal-based proteins include meat, poultry, fish, eggs, milk, and dairy products.



Image credit: Freepik.com - by @brgfx
Images courtesy of Freepik.com - by @macrovector

# Legumes: provide quality protein and iron

Legumes (lentils, peas, beans, chickpeas, soybeans) provide high quality protein and non-heme iron.

- They are low in fat and high in fibre.
- These are the dry fruits of plants that we eat after cooking.
- When it comes to canned legumes, choose low-salt and fats.
- This includes soya bean products.

Food products made from soybeans can be divided according to the method of production into:

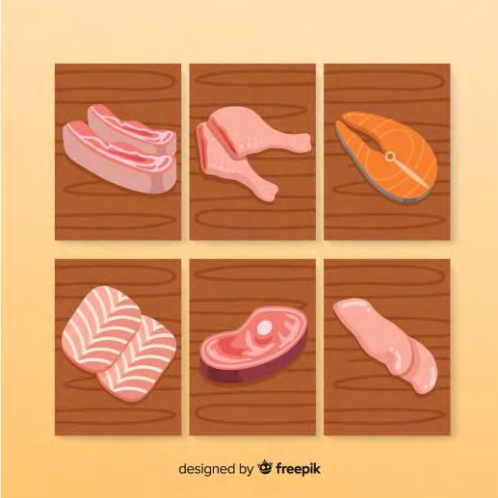
- fermented (e.g. tempeh, natto, soy sauce, miso, sufu or yoghurt-like products) and
- unfermented (e.g. tofu, soya beverages, soya bean, protein concentrates).
  - nutritionally, minimally processed and fermented soy products.

Image credit: Freepik.com - by @brgfx

# Fish, poultry: provide protein, iron, iodine, ω-3MK

## Fish

- Fish contain a variety of nutrients,
  - — that we can hardly get from other foods.
  - — are rich in protein and iodine.
- Oily marine fish, e.g. salmon, mackerel, herring:
  - — contain about 10 % fat and
  - — are a good source of vitamin D and omega-3 fatty acids with EPA, DHA.
  - — Most people do not consume enough of these fatty acids.
  - — it is important to eat a variety of fish, marine, freshwater and small fish - (sardines with bones).




## Poultry

- Among the poultry here chicken, turkey, duck and goose.
- Poultry provides easily digestible protein and smaller amounts of iron (more in darker poultry meat, e.g. thighs).
- Preference should be given to lean, low-fat meats.
  - — most of the fat is in the skin, so remove it before eating.
  - — goose and duck meat contain a lot of saturated fatty acids.

# Red meat: rich in protein, vitamins and iron

## Lean unprocessed red* meat

The most commonly consumed is pork, beef, less commonly lamb, goat meat and meat from game and rabbit.

- It is a good source of protein, haem iron and vitamins of the group B, mainly $B_{12}$.
- Preference should be given to lean, low-fat meats.
- *Red meat refers to meat of **carnivores and birds** with higher myoglobin content.
- "RED" meat does not include fish, chicken and turkey (breast), some types of pork (tenderloin, curried).
- 'RED' meat has a typical red colour in its raw state and is dark after cooking, unlike 'WHITE' meat which is pale in colour both before and after cooking.

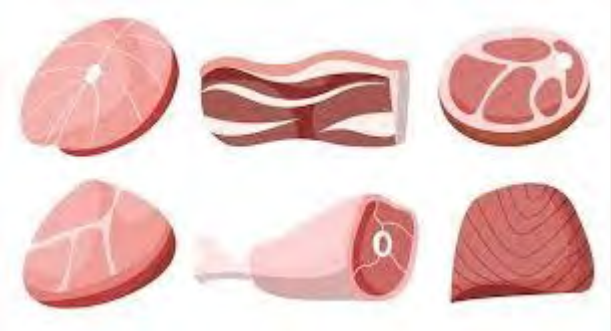


Image credit: Freepik.com

# Eggs: rich in protein, cholesterol, vitamins, ML and SP

## Eggs

- Eggs are a good source of valuable protein.
- The egg white does not contain fat.
- Egg yolk also contains fat, fat-soluble vitamins, minerals and trace elements (iron, phosphorus, potassium, zinc, selenium...), cholesterol and carotenoids with antioxidant effects (lutein, ZEAXANTHIN).

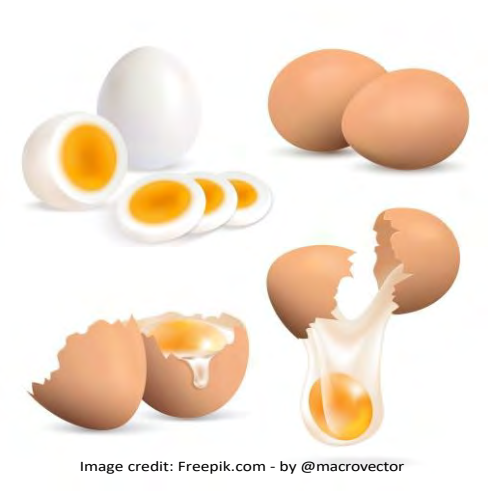


Image credit: Freepik.com - by @macrovector

# Nuts and seeds:

## high in fat, protein, fibre, vitamins and minerals

### Nuts and plant seeds

- NUTS include walnuts, macadamia nuts, hazelnuts, Brazil nuts, almonds, cashews, pine nuts and pistachios.
- SEED PLANT include Pumpkin, flax, sunflower, sesame, chia, poppy and other types.
- Nuts and seeds are high in protein, fibre, as well as mono-unsaturated and polyunsaturated fatty acids, which are beneficial for health.
- OILSEED CROPS. Due to their high oil content, the nuts and seeds of the plants are also known as oilseeds and contain however, a lot of calories.

Image credit: Freepik.com - by @macrovector

# How many protein-rich foods to eat?

**Consume protein-rich foods daily.**

**Ensure the regular alternation of different protein-rich foods.**

**Eat more legumes and fish, less meat.**

**From protein-rich foods, eat 2 servings daily.**

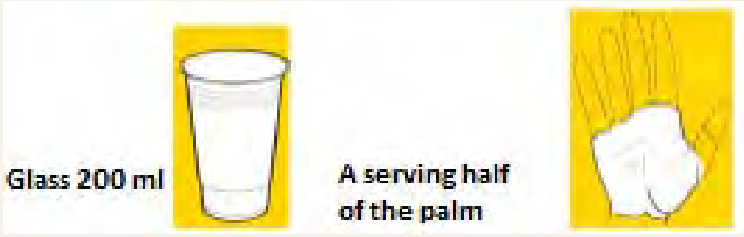
**Alternate them!**

**One standard serving of protein-rich foods is:**
**Lean meat: Half a portion (50–75 g of cooked meat).**
**Poultry: Half a portion (50–75 g of cooked meat).**
**Fish: Half a portion (100 g of cooked fish). Canned fish is not included.**
**Legumes: ¾ cup of cooked beans, peas, or lentils. Soy and soy products: 100 g of cooked soy or tofu.**
**Eggs: 2 pieces.**
**Nuts and seeds: A handful or 5–15 pieces depending on the type, unsalted.**

**Glass: 200 ml** **Serving size: Half a palm**

**Weekly recommendations:**

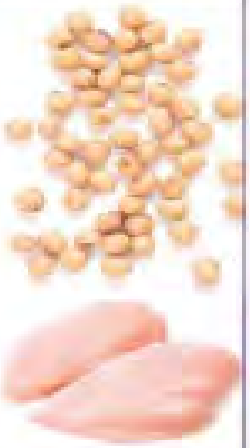
**2–3 servings of lean meat**
**2–3 servings of poultry**
**1–2 servings of fish, including at least one serving of fatty fish**
**2–5 servings of legumes, soy, or tofu**
**2–5 servings of nuts and seeds**
**1–2 servings of eggs (2–4 eggs)**




## Meat and Legumes

**Meat and legumes are** the only main sources of protein, the building blocks of cells, muscles, tissues, and bones.
Fat in meat is a source of saturated fatty acids, whose intake should be limited. Lean meat should be preferred, and visible fat should be removed before cooking. **Eat more poultry and fish**, less red and processed meat. Processed meats contain a high amount of salt and unhealthy fats, which can negatively impact health.
Fish, especially fatty sea fish, are an important source of omega-3 fatty acids, which are essential for brain and heart health. **It is recommended to eat fish at least twice a week.**

**Legumes are an important source of plant-based protein.** They should be eaten regularly and can replace meat. One portion is a plate of cooked lentils, beans, peas, chickpeas, or soy products.



• 2–3 servings per day

**Recommended intake:**
**• 2–3 servings per day**
**• 1 serving = 100 g of cooked meat or 150 g of cooked legumes**

Figure: Minárik P, Mináriková D. Cancer and life. Facts and myths. CONTACT, 2013. Image taken from: Minárik P, Fábryová Ľ, Penesová A, Ukropcová B, Blaho E. Reduction diet. Let's try it differently! Dr. Josef Raabe Slovakia, 2021

# Animal foods: their impact on the environment

## Animal-based foods and their impact on the planet

The production and consumption of animal-based foods generally have a greater negative impact on our planet compared to a diet primarily based on plant-based foods.

**Calls to reduce the consumption of animal-based foods not only support health but are also more environmentally friendly.** Even though meat by-products do not have a more favorable composition of essential nutrients, they should contain **fewer xenobiotics** compared to conventional foods. (Note: Xenobiotics are foreign substances to the body, which can often have harmful effects on human health). A more sustainable way of livestock farming can help reduce environmental impact.


## Plant-based diets should be complemented with animal-based foods.

A diet primarily based on plant-based foods should be complemented with animal-based foods, such as low-fat milk, dairy products, fish, lean meat, and eggs.

For most adults, it may be beneficial to eat only plant-based food for 1–3 days per week.


Images courtesy of Freepik.com

# Red meat: heart and blood vessel disease | Ca colon

## Red and Processed Meat

**The majority of the population consumes far more red and processed meat than is healthy.** This has been proven to be associated with a higher risk of developing various cancers, particularly colorectal cancer. There is also an increased risk of cardiovascular diseases and type 2 diabetes.

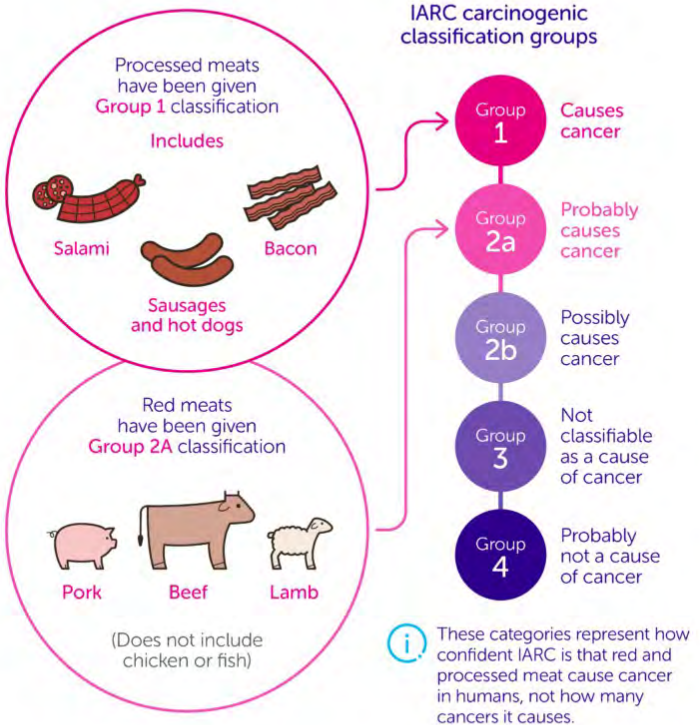
**Moderate consumption of animal-based foods helps reduce the intake of saturated and trans fats as well as cholesterol in the diet.**

No more than **350–500 g** of cooked red meat should be consumed per week.

Processed meat products and smoked meats should be completely avoided, or **eaten only occasionally and in small quantities**. (Processed meats and smoked products primarily include sausages, salami, hot dogs, bacon, pâtés, liver spreads, and many other similar products).

Image credit: https://www.foodnavigator.com2016/12/22/Eating-red-meat-to-excess-appears-not-to-raise-heart-attack-risk

# Meat and cancer: How strong is the evidence?

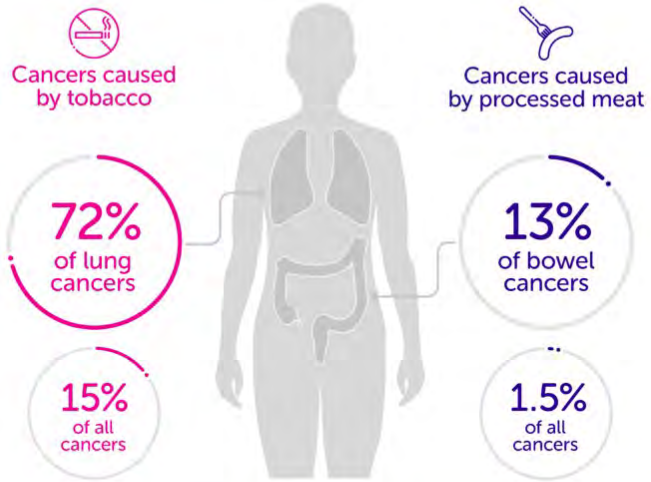



Together we will beat cancer

CANCER RESEARCH UK

# Tobacco vs meat – what's the risk?

The evidence that processed meat causes cancer is as strong as the evidence for tobacco, but the risk from tobacco is much higher...




The number of cases per year in the UK that could be prevented by...


Together we will beat cancer

CANCER RESEARCH UK

Images courtesy of Cancer Research UK

# Animal foods: summary and advice in conclusion

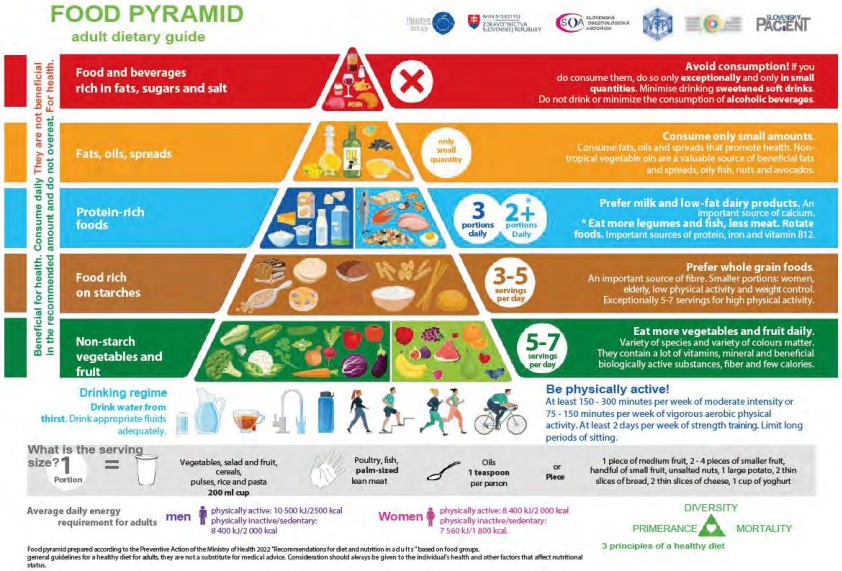
## Additional Advice

**Meat, fish, legumes, and soy** products are usually consumed as main meals.
Nuts and plant seeds are usually consumed as snacks or as ingredients in other dishes such as salads, pasta, desserts, and bread.
For nuts and seeds, prefer unroasted varieties without added fats, salt, or sugar.
Heme iron from meat is absorbed easily, while non-heme iron from legumes and eggs is absorbed more slowly. Iron absorption is improved by consuming foods rich in vitamin C, such as leafy greens, tomatoes, and citrus fruits.
Ensure safe and gentle heat preparation of meat and fish. Prefer boiling, stewing, or steaming over other methods.

**Avoid frying and grilling over an open flame.**
When grilling, follow safe grilling practices, such as avoiding direct contact of food with flames, draining fat from the meat to prevent flare-ups, grilling for a shorter time at lower temperatures, and removing burnt parts of the meat. However, some harmful substances cannot be completely eliminated, so it is better to prepare meals using other cooking methods.

Eggs are part of a healthy diet, but their consumption should not be overdone, especially with egg yolks. Consuming up to seven egg yolks per week and any amount of egg whites does not increase blood cholesterol levels in healthy adults. Egg whites are not restricted, as they are also added to other foods (e.g., in pasta).

Soybeans and soy products contain other biologically active substances, such as **isoflavones,** which have several beneficial health effects. Moderate consumption of minimally processed soy products, tofu, and fermented soy products is beneficial for the health of adults.




Source : https://www.health.gov.sk/?Postupy-Prevencia

# FATS, OILS, SPREADS


**The fourth floor of the food pyramid:** belongs to **fats, oils and fat spreads**.

# Nuts, seeds: do not include fats, oils and spreads

**WARNING!**

Despite their higher fat content, nuts and plant seeds **do not belong to this group,** as they are classified as protein-rich foods due to their high protein content.

Similarly, **many sweet and salty snacks and fatty delicacies** (such as chocolate, cookies, wafers, cakes, baked and unbaked pastries, crackers, chips, etc.) do not belong to this group either. Due to their negative impact on health, they are classified as foods high in fats, sugars, and salt.


Image credit: Freepik.com - by @macrovector

# Eat fats in small amounts!

# Prefer fats that promote health!

**Consume fats, oils, and spreads that support health!**

**However, consume them only in small amounts.**

**Non-tropical vegetable fats, oils, and spreads made from them have a composition beneficial for health.**

Image credit: Freepik.com

# Fats in the structure of nutrition!

## Fats in sight of health!

- Fats (lipids) are an important source of:
  **ENERGY**, **ESSENTIAL FATTY ACIDS** and **FAT-SOLVING VITAMINS**.
- Fats can be of both vegetable and animal origin.
- Animal fats (butter, lard, suet) have a **TIGHT** consistency.
- Vegetable non-tropical fats **(oils)** have a **LIQUID** consistency.
- Tropical vegetable fats (coconut fat, palm fat, palm kernel fat) have a higher **saturated** fatty acid content **HARD** consistency.
- Excessive fat intake contributes to overweight and obesity.
  — fats (lipids) contain **various fatty acids**,
  — some fatty acids **support** our **health** and others increase the risk of developing cardiovascular **diseases**.
  — **For more information** on the relationship of fats to health, see the chapter on nutrients.

# Fats are an important component of the diet! Choose the right fats!

**Fats are an important part of the diet, but it is important to:**

**- Limit the total amount of any fats consumed, as they all have a very high energy content (calories).**

**- Choose the right types of fats, since some are beneficial for health while others are not.**

**What does this food group include?**

**- Animal fats, tropical vegetable fats, or mixed fats: These have a solid consistency at room temperature.**

**- Vegetable oils: These have a liquid consistency at room temperature.**

**- Spreads (butter, margarine, and similar products): These are products whose essential component is animal fat, vegetable oil, or their blend. They are mostly produced as solid spreads, which are suitable for spreading, but they can also be liquid (for baking) or semi-solid (like creamy spreads and dressings).**

# Consume fats in reasonable amounts!

# Learn to recognize standard servings of fats and oils!

**How much fats, oils, and spreads should we consume?**

**Foods from the fats, oils, and spreads group should be consumed only in small amounts.**

**One standard serving is:**

**One teaspoon (5 ml) of oil per person when cooking.**
**A small "mini" pack (10 g) of fat spread is enough to spread on two slices of bread.**



Choose types with a healthier composition for better health.
Fats, as a nutrient, affect our health depending on which fatty acids they primarily contain.

The best choice includes fats, non-tropical oils, and fat spreads that mainly contain monounsaturated and polyunsaturated fatty acids (FA).

For fat spreads, the best options are products with lower fat and calorie content, a predominance of unsaturated FA, or ideally, a balanced ratio of omega-6 and omega-3 FA.
Fats, oils, and spreads should be consumed daily, but only in small amounts.

Non-tropical vegetable oils mainly contain monounsaturated or polyunsaturated FA. It is recommended to combine different vegetable oils (e.g., mixing olive oil with rapeseed oil).

# Dietary fats affect consumer health!

## Eat fats in small amounts daily!

## Prefer non-tropical vegetable oils!

Choose types with a healthier composition for better health.

Fats, as a nutrient, affect our health depending on **which fatty acids they primarily contain.**

The best choice includes fats, non-tropical oils, and fat spreads that mainly contain monounsaturated and polyunsaturated fatty acids (FA).

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Fats, oils, and spreads should be consumed daily, but only in small amounts.
Non-tropical vegetable oils mainly contain monounsaturated or polyunsaturated FA. It is recommended to alternate different types of vegetable oils or combine them (e.g., mixing olive oil with rapeseed oil).

Image credit: Freepik.com by @valadzionak_volha

# Olive and rapeseed oil - a good choice !

## The combination of olive and rapeseed oil is the ideal solution!

**The group of non-tropical vegetable oils includes:**

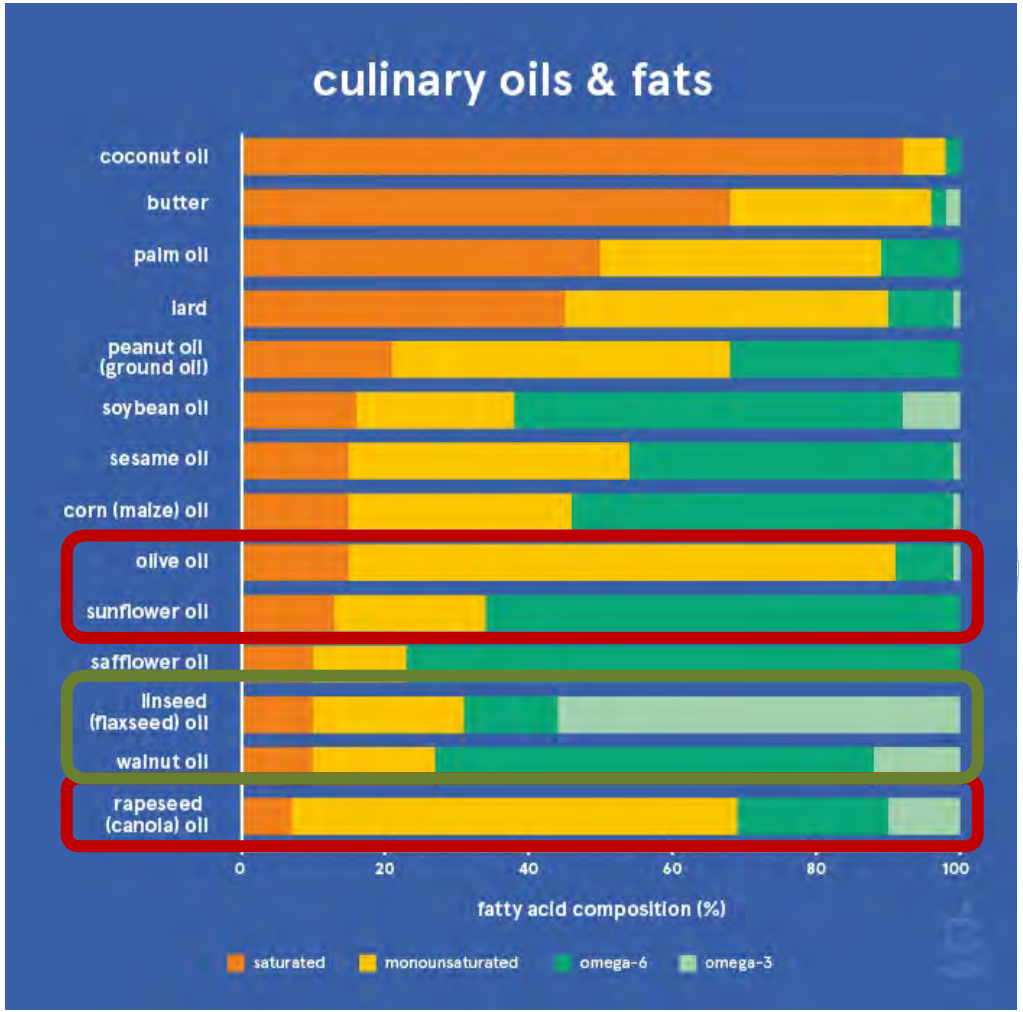
- **Olive, rapeseed, sesame, almond, avocado oil, spreads (margarines) and products made from them, nuts, and plant seeds.**
**These are rich in monounsaturated fatty acids (English abbreviation: MUFA).**

- **Sunflower, soybean, sesame, corn, pumpkin seed oil, and seeds such as pumpkin, sunflower, sesame, flax, and hemp.**
**These are rich in polyunsaturated fatty acids of the omega-6 type (English abbreviation: ω-6 PUFA).**

- **Rapeseed and flaxseed oil, flax and chia seeds, walnuts, fish oil, and fatty fish.**
**These are rich in polyunsaturated fatty acids of the omega-3 type (English abbreviation: ω-3 PUFA). The English abbreviations for plant-based omega-3 fatty acids are ALA, and for omega-3 fatty acids from fish oil, they are EPA and DHA.**


eufic


WHY DO WE NEED FATS?
help brain development and function - 60% of brain is fat
as a structural component of cells
K
E
D
A
support the absorption of vitamins
certain types help to keep a healthy heart and blood vessels
source of energy


culinary oils & fats
coconut oil
butter
palm oil
lard
peanut oil (ground oil)
soybean oil
sesame oil
corn (maize) oil
olive oil
sunflower oil
safflower oil
linseed (flaxseed) oil
walnut oil
rapeseed (canola) oil
0
20
40
60
80
100
fatty acid composition (%)
saturated
monounsaturated
omega-6
omega-3

# Healthy fats

## NUTS:

walnuts, hazelnuts, steam, almonds

## SEVEN:

linseed, sunflower, pumpkin, hemp

## OILS:

rapeseed, linseed, olive, sunflower

## FISH:

from cold seas, fatty: salmon, tuna

# Limit your consumption of animal and tropical vegetable fats!

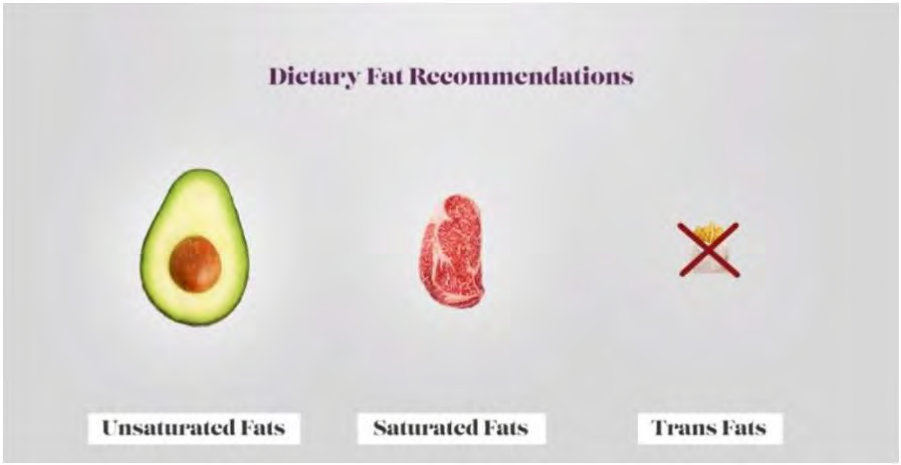
## Fish oil is exceptional for its high EPA, DHA content and promotes health!

**Limit the consumption of those as much as possible:**

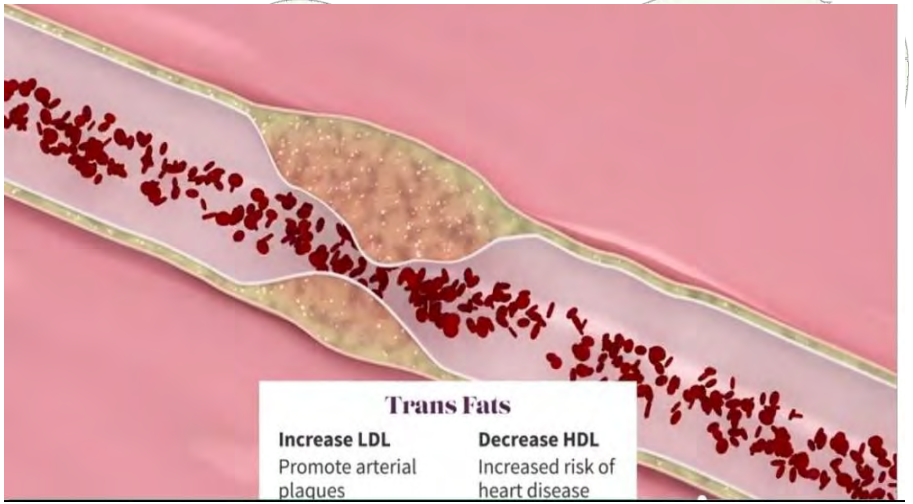
**Animal fats, such as butter, ghee, lard, beef tallow, bacon, poultry skin, fatty meats, cream, heavy cream, and other fat-rich cheeses.**

**Tropical vegetable fats, such as coconut oil, palm oil, palm kernel fat, and coconut butter. Due to their properties and stability, they are widely used in the food industry for the production of processed foods or for frying. They mainly contain saturated fatty acids, which are not beneficial for health.**

Image credit: Freepik.com by @macrovector






https://rudimentalpantry.com/saturated-vs-unsaturated-fats-are-they-good-or-bad/

# Limit your intake of trans-fatty acids!

## Limit your consumption of foods containing solidified fats!

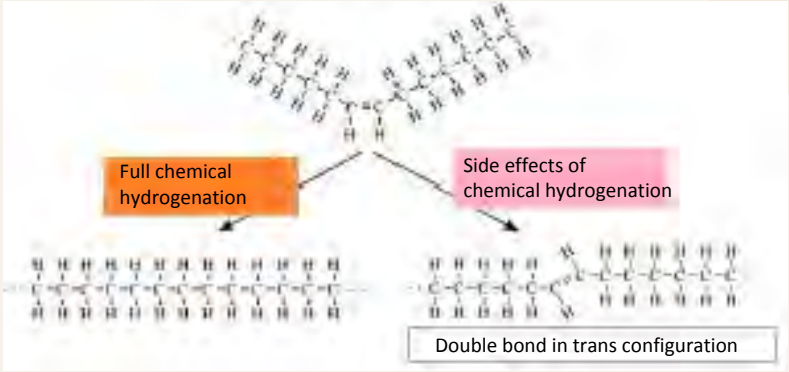
Avoid consuming foods that contain trans fatty acids. Their consumption increases the risk of cardiovascular diseases and certain types of cancer.

The daily intake of trans fatty acids should not exceed 1% of total daily energy intake. For an intake of 2,000 kcal/8,400 kJ, this is a maximum of 2 g.

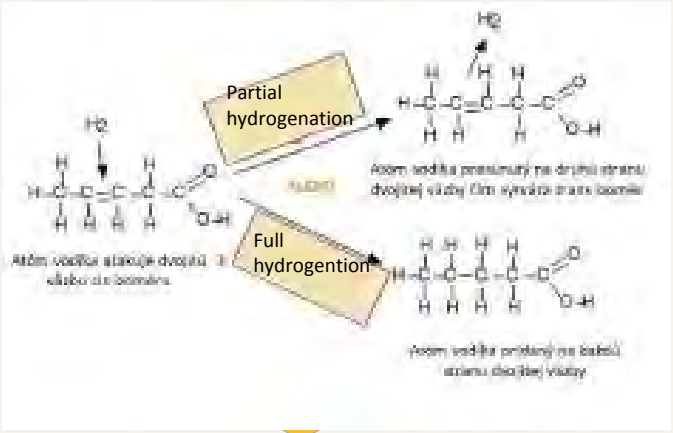
**Trans fatty acids are mainly formed during the process of hardening vegetable oils into solid fats.** These are commonly used in the production of highly processed foods. Commercially made cookies, cakes, pastries, confectionery, popcorn, some deep-fried and baked goods, and some fast foods such as french fries and fried chicken contain a high amount of trans fats, which negatively affect health.

**Some trans fatty acids are also naturally present in small amounts in dairy products, butter, and meat from ruminant animals.** Their intake can be reduced by consuming lean meat and low-fat dairy products.

**Detailed information about trans fatty acids, hydrogenated fats, and foods that may be sources of trans fats can be found in the chapter on nutrients.**




TRANs:
MAX 1-2
PER DAY




Total and partial hydrogenation of unsaturated fatty acids (source: HAUGH, 2007)

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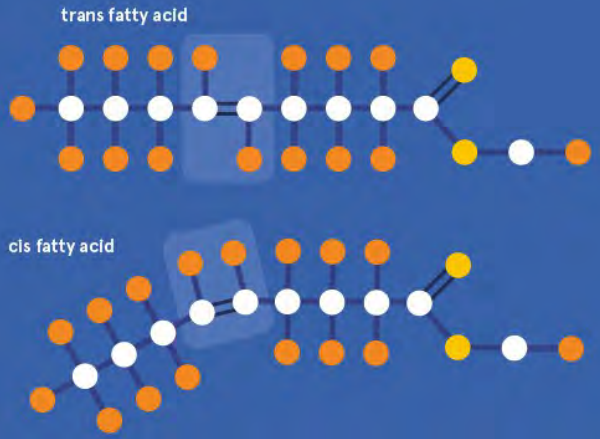
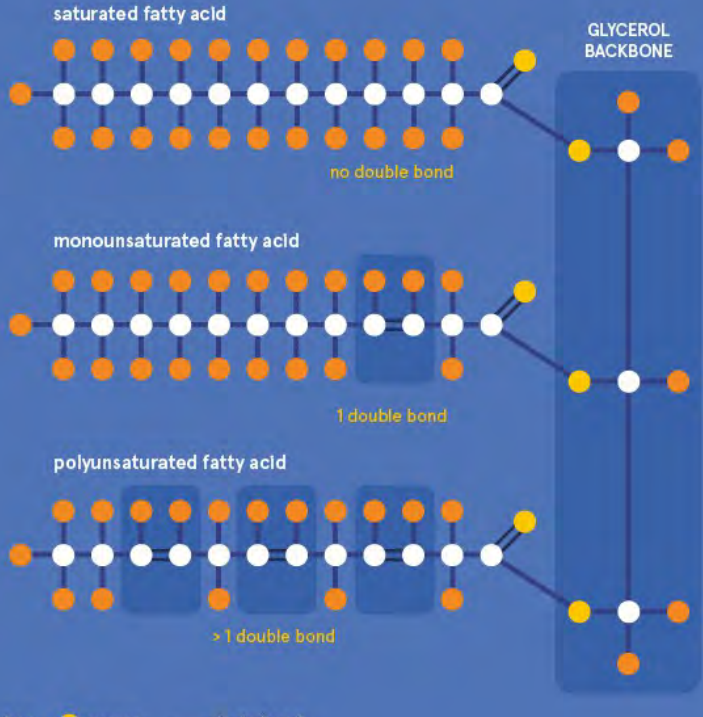
## WHAT ABOUT TRANS FATS?

trans fats are unsaturated fats with hydrogen atoms bonded in the trans configuration




## WHAT ARE FATS MADE OF?



# Cow butter and ghee butter are rich in saturated MK!

## Hidden fats significantly increase the energy content of foods.

## Hidden fats are a common source of saturated and trans fats!

### Butter and Ghee Butter

Butter and ghee butter are animal-based fats with a high content of saturated fatty acids. Ghee butter is obtained from butter by heating and removing water and non-fat components; however, its fat content and composition are identical to butter.

### Hidden Fats

**Some fats are easy to see**, such as when you spread them on bread or when dealing with fatty meat. You can also see fats or oils when frying.

**Many fats, especially those high in saturated fatty acids or trans fatty acids, are hidden.** These "hidden" fats are mainly found in processed meat products, ground meat, full-fat dairy products and cheeses, sweets, salty snacks, and processed foods.

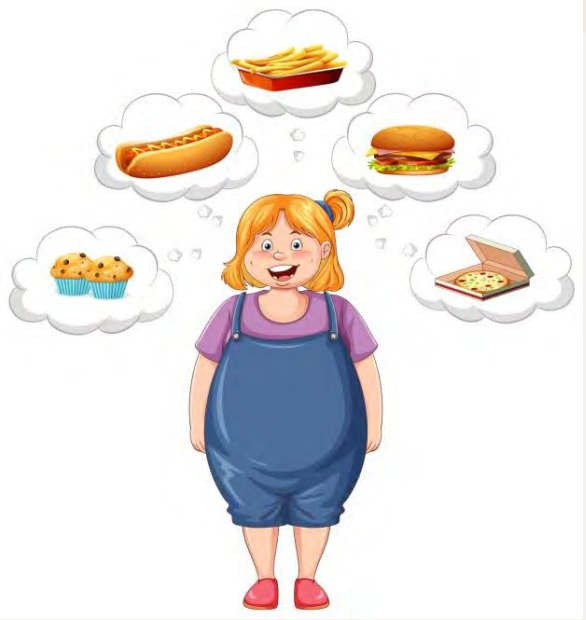


Image credit: Freepik.com by @brgfx

# Butter or margarine = what to spread on bread?

**The best choice for health = are margarines with lower fat content and no trans MK.**

**Best choice for taste = is classic cow butter for most consumers.**

## Margarine, Fat Spreads

They are mainly used as spreadable fats for bread.

**They are made from vegetable oils** containing unsaturated fatty acids.

**They contain very little saturated fatty acids and generally have a lower total fat content (20–60%).** Modern vegetable margarine spreads, intended as a substitute for butter, are produced using advanced technologies and should not contain trans fatty acids (TFAs), or should contain less than 0.5–1%. According to European regulations, a food product may contain a maximum of 2% trans fatty acids per 100 g of fat.

# Avocado:

## is a fruit high in healthy fats, fibre, vitamins and minerals.

**Avocado**

Avocado is a fruit that is classified within the vegetable and fruit group.

**Avocado contains more fat, m**ostly in the form of monounsaturated fatty acids (MUFA).

**Avocado is rich in fiber**, various vitamins, and minerals.

The energy content in avocado is high, so it should be consumed in moderation, usually no more than half an avocado at a time.

**Avocado oil is also a good option.**

**Fats and oils affect not only health but also the environment and the planet.**

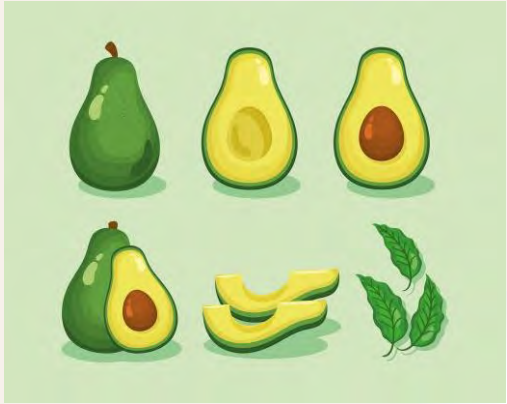
**Animal fats** (such as butter or lard), as well as the production of tropical vegetable fats (such as palm and coconut oil), are not beneficial for health or the planet.

**Their production, processing, and transportation have a very negative impact on the environment.**

# Tropical fats:

## coconut and palm oil:

## do not benefit the health of people or the planet.



# Fats for the end:

## remember some good advice about eating fats and oils!

### Additional Advice

- For cooking (hot kitchen), the best choice is refined oils, such as olive oil or rapeseed oil.
- For preparing salads from raw vegetables (cold kitchen), it is best to use cold-pressed unrefined vegetable oils, especially extra virgin olive oil.
- Alternate the consumption of non-tropical vegetable oils (rapeseed, olive, sunflower, and others).
- Depending on availability, you can also include less common types of vegetable oils.

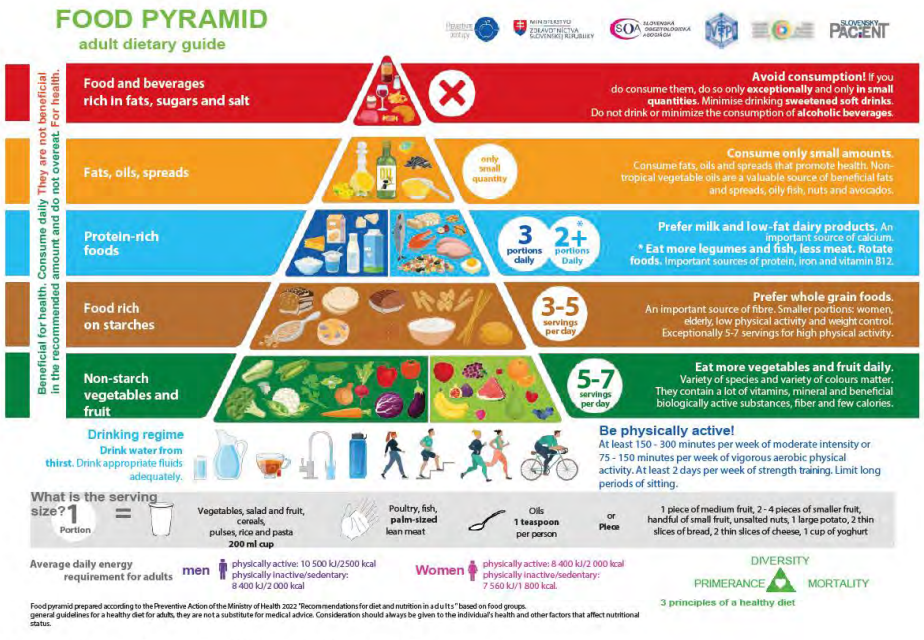
Image credit: Freepik.com by @azerbaijan_stockers

**- Avocado is a fruit**. It mainly contains monounsaturated fatty acids, but also fiber, certain vitamins, and minerals. However, it has a high fat and calorie content. Consume it occasionally and not more than half an avocado. Avocado oil is also a good option.

- **Vegetable fat spreads and butter can be replaced with spreads made from curd or legumes.**

- You can reduce your intake of saturated fatty acids by consuming lean meat, poultry without skin, and dairy products with lower fat content.

- A proper balance between omega-6 and omega-3 fatty acids is important for health. Most people need to increase their intake of omega-3 fatty acids. This can be achieved through the regular consumption of fatty fish, rapeseed oil, flaxseed oil, flaxseeds, or walnuts.




Source : https://www.health.gov.sk/?Postupy-Prevencia

**Foods rich in fats, sugars, and salt:** they are not good for your health

**Foods rich in fats, sugars and salt:** form the **FIFTH "CUT OFF" the bottom of the** food pyramid.

# Foods rich in fats, sugars and salt:

## This food group is an important component of (highly) processed foods. They are not necessary for nutrition and do not benefit health.

**These foods are not necessary for nutrition or health.**

**On the contrary, this type of food has a negative impact on health.**

**Avoid foods and beverages high in fat, sugar, and salt.**

**If you consume them, do so only occasionally and in small amounts.**

Image credit: Freepik.com by @brgfx

# Foods rich in fats, sugars and salt:

## are high in calories, fat, saturated MK, sugars and salt,
## are low in fibre, vitamins, minerals and phytochemicals.

- Foods and beverages in this group have a **high energy (calorie) content**, fat (saturated fatty acids and trans fatty acids), sugar, and salt.

- Foods and beverages in this group have a **low content of fiber, vitamins, and minerals.** They are not necessary for a healthy diet; on the contrary, they have a negative impact on health.

- Most people consume them frequently, and many eat them daily.

- **Foods and beverages in this group contribute to weight gain**, obesity, tooth decay, and many serious chronic diseases (cardiovascular diseases, type 2 diabetes, certain cancers, and others).

- **The separated top of the food pyramid**. Foods and beverages high in fats, sugar, and salt are not part of a diet beneficial to health, which is symbolized by the separated top of the food pyramid.

- Everyone should **reduce their intake of foods and beverages in this group** if they want to eat wisely and prevent diseases.

Obrázok: https://www.pinterest.co.uk/pin/609323024576158365/

# Foods rich in fats, sugars and salt:

## They are almost identical to the group of processed and highly processed foods. They are a common ingredient in fast food dishes.

**What does this food group include?**

This group is very **diverse and numerous.**

**It includes many processed and highly processed foods and beverages.**

**Specifically, this group includes** bakery products (cakes, pastries, breadsticks), sweets, biscuits, wafers (especially those with fillings and coatings), desserts, low-quality chocolate (milky, breakfast cereals with added sugar), processed meats (sausages, hot dogs, canned meat), hamburgers, pizza, fried meat and fish products, canned meat and fish with added saturated fats and salt, instant noodles and chips, crackers and other salty snacks, spreads, processed cheeses, margarine, flavored and sweetened yogurts, alcoholic beverages, soft drinks, flavored waters, carbonated drinks with added sugar, energy drinks, sports drinks, hot and cold drinks such as iced tea, coffee drinks, flavored milk, and more.

FAsT FOOD

Image credit: Freepik.com

World Health Organization

FAO FIAT PANIS

efsa EUROPEAN FOOD SAFETY AUTHORITY

World Health Organization

FACT SHEET N°394 UPDATED AUGUST 2018

# Healthy diet

## KEY FACTS

- A healthy diet helps to protect against malnutrition in all its forms, as well as noncommunicable diseases (NCDs) such as diabetes, heart disease, stroke and cancer.
- Unhealthy diet and lack of physical activity are leading global risks to health.
- Healthy dietary practices start early in life – breastfeeding fosters healthy growth and improves cognitive development, and may have longer term health benefits such as reducing the risk of becoming overweight or obese and developing NCDs later in life.
- Energy intake (calories) should be in balance with energy expenditure. To avoid unhealthy weight gain, total fat should not exceed 30% of total energy intake *(1, 2, 3)*. Intake of saturated fats should be less than 10% of total energy intake; and intake of *trans*-fats less than 1% of total energy intake, with a shift in fat consumption away from satutated fats and *trans*-fats to unsaturated fats *(3)*, and towards the goal of eliminating industrially-produced *trans*-fats *(4, 5, 6)*.
- Limiting intake of free sugars to less than 10% of total energy intake *(2, 7)* is part of a healthy diet. A further reduction to less than 5% of total energy intake is suggested for additional health benefits *(7)*.
- Keeping salt intake to less than 5 g per day (equivalent to sodium intake of less than 2 g per day) helps to prevent hypertension, and reduces the risk of heart disease and stroke in the adult population *(8)*.
- WHO Member States have agreed to reduce the global population's intake of salt by 30% by 2025; they have also agreed to halt the rise in diabetes and obesity in adults and adolescents as well as in childhood overweight by 2025 *(9, 10)*.

## OVERVIEW

Consuming a healthy diet throughout the life-course helps to prevent malnutrition in all its forms as well as a range of noncommunicable diseases (NCDs) and conditions. However, increased production of processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. People are now consuming more foods high in energy, fats, free sugars and salt/sodium, and many people do not eat enough fruit, vegetables and other dietary fibre such as whole grains.

The exact make-up of a diversified, balanced and healthy diet will vary depending on individual characteristics (e.g. age, gender, lifestyle and degree of physical activity), cultural context, locally available foods and dietary customs. However, the basic principles of what constitutes a healthy diet remain the same.

http://www.who.int/mediacentre/factsheets/fs394/en/

1

## Recommendations of Global Health Institutions

Major global institutions, including the World Health Organization (WHO), recommend measures we should follow in our diet to ensure that our nutrition benefits our health.

| Key Dietary Guidelines Related to Health \| WHO Recommendations | |
|---|---|
| 1 \| Fruits, vegetables, legumes, nuts, and whole grains are part of a healthy diet. | |
| 2 \| Amount of consumed fruit and non-starchy vegetables* \| | **≥400 g per day \| ≥several portions daily** |
| 3 \| Energy intake from added **free sugars** \| | **< 10% of total energy intake (TEI)** |
| 4 \| Energy intake from total **fats** \| | **< 30% of TEI** |
| Energy intake from **saturated fatty acids (SFA)** \| | **< 10% of TEI** |
| Energy intake from **trans fatty acids (TFA)** \| | **< 1% of TEI** |
| 5 \| Daily **salt intake** \| | **< 5 g** |

# What are "free sugars"?

## The most common source of free sugars is (highly) processed foods

### What are "free sugars"?

The term "free sugars" includes all simple sugars (scientifically known as monosaccharides: glucose, fructose) and disaccharides: sucrose (which is common table sugar made from sugar beet or sugar cane) that are added to foods by manufacturers, cooks, or consumers. **It also includes sugars naturally present in honey, syrups, fruit and vegetable juices, and juice concentrates.**


Source: Health Canada, 2019
Image credit: Golian, Minárik, Mináriková, 2021

### Excluded from Free Sugars

Sugars naturally present in **milk (lactose)**, as well as sugars contained in the cell structures of **vegetables and fruits (fructose), grains, and legumes**, are not considered free sugars.

### Effects of Excessive Free Sugar Consumption

Excessive consumption of foods and beverages high in free sugars contribute to weight gain, obesity, and associated diseases, as well as tooth decay. Free sugars are not always explicitly listed on food and beverage labels. More information about free sugars can be found in the nutrition chapter.

### What Does 5% Free Sugar Intake Mean?

- **For adults and children over 11 years old**: 7 sugar cubes / 30 grams
- **For younger children**: Maximum 5–6 sugar cubes / 19–24 grams

# Beware of "hidden" sugars!
# Watch out for "hidden"salt!

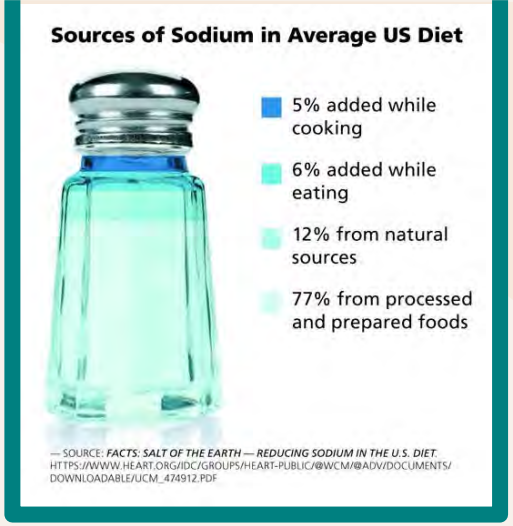
**Beware of "Hidden Sugars"!**

Hidden sugars are found in various processed foods that may not taste sweet (e.g., 100 g of ketchup can contain up to 24 g of sugar) or even in low-fat dairy products, some of which may have a higher sugar content.

Beware of "Hidden Salt" Too!

The recommended daily salt intake (maximum 5 g per day) includes the total amount of salt consumed through added salt as well as from foods and beverages.

Many foods contain high amounts of salt, especially processed meats, cured meats, processed meat products, aged cheeses, semi-finished products, salty snacks, as well as bread and baked goods.





Pictures taken from the internet

# Processed foods Good advice from the experts!

## How Can You Follow Expert Recommendations?

**The best approach is to avoid consuming foods and beverages** that contain excess energy (calories), fats, saturated fats, trans fats, added sugars, and salt.

**If you do consume them, do so only occasionally and in small amounts.**
Do not eat them more than 1–2 times per week.

**Limit the consumption of highly processed foods** (Ultra-Processed Food, UPF).

Whenever possible, **choose less processed foods** within each food category.

**Try to prepare and cook your meals at home** as much as possible and prioritize freshly prepared meals.


Image: taken from the internet

# Processed foods

## good advice from the experts!

**Replace!**

Instead of sweets, choose fresh fruit.
Instead of potato chips, opt for unsalted nuts and plant seeds.

**Reduce Portions!**

Reduce portions of foods high in fats, sugars, and salt!

Examples: A smaller muffin, a smaller handful of potato chips, etc.


Image: taken from the internet

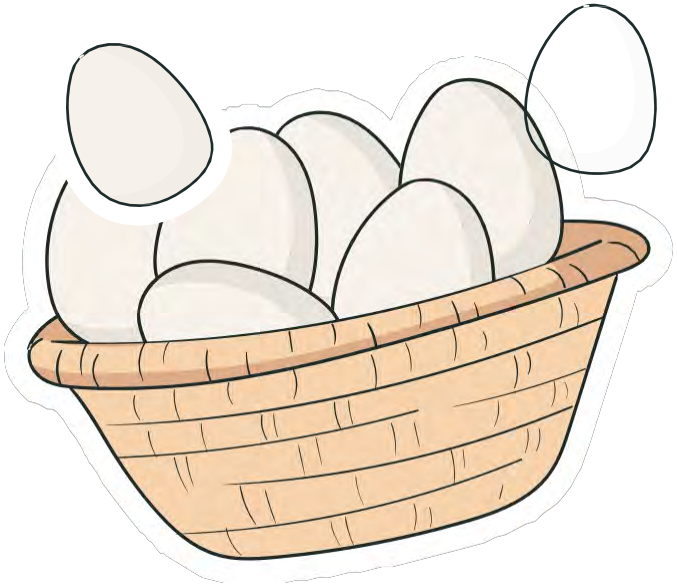
# Processed foods

## ◘ good advice from the experts!

### Only Occasionally!

- **Consume ready-made meals, processed foods, and fast food only occasionally.**
- **Replace frying with cooking** in water or steaming.
- **Salt and season foods only after cooking**. Use herbs and spices without added salt.
- **Avoid oversalting food**; do not keep a salt shaker at hand.
- **Replace sweets with fruit and low-fat,** unsweetened dairy desserts.
- **Replace salty snacks** with unsalted nuts.
- **Prefer canned products in their own juice** rather than those with added salt and sugar.
- **Reduce the amount of sugar** when baking and cooking.
- **Quench thirst with water** or unsweetened beverages instead of sugary drinks.

Image: taken from the internet



# Thanks for your attention!

INNOVATIVE STEPS

Funded by the European Union

# Liquids, beverages and drinking regime Lesson 4

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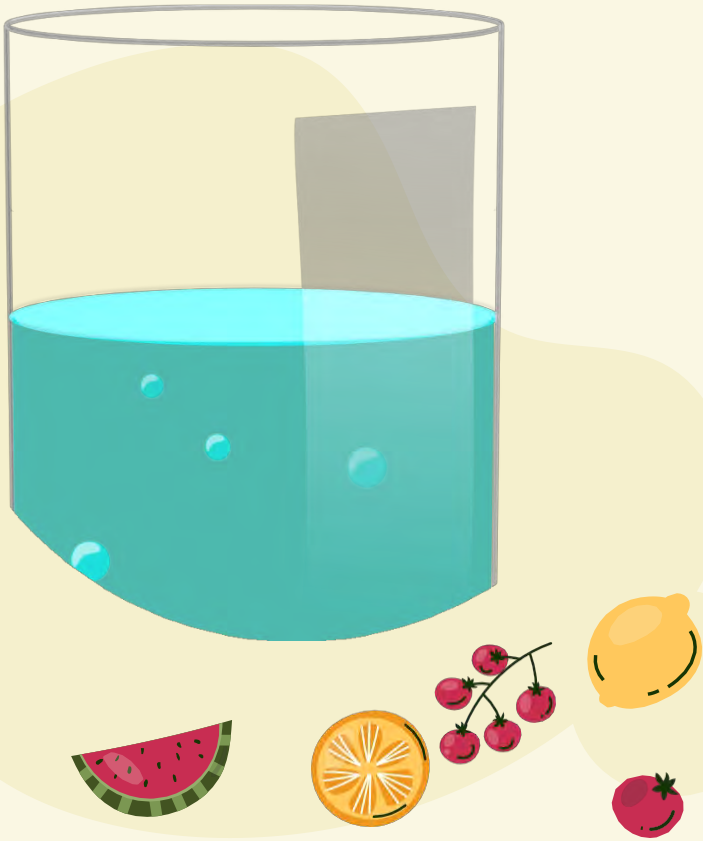
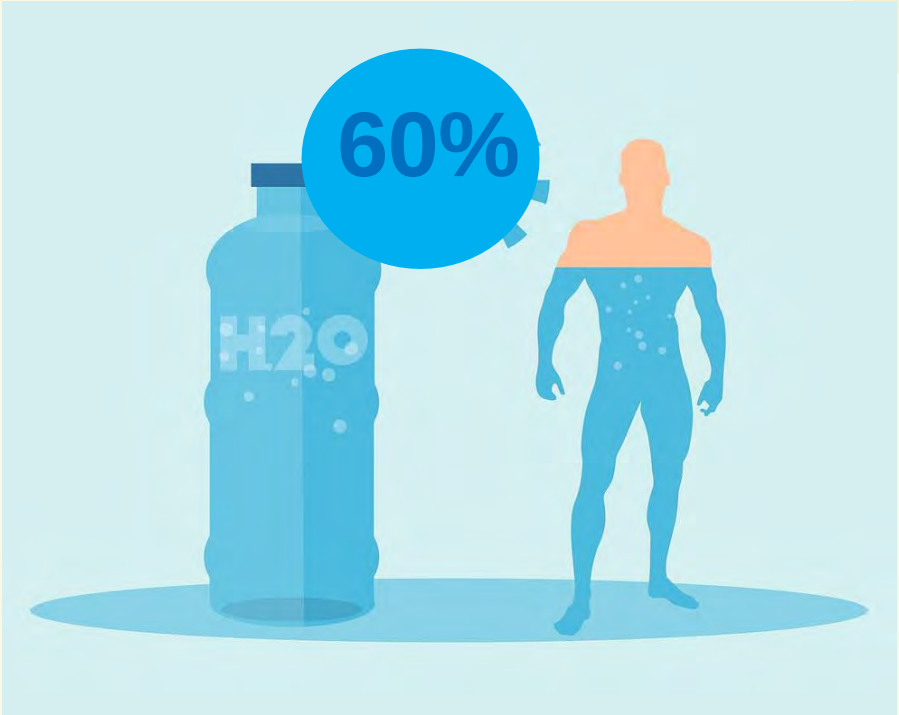


# 4.1

# Water in the human body

# Functions of water in the human body:

- Oxygen distribution.
- Distribution of nutrients, minerals, vitamins, hormones.
- Excretion of undigested food and pollutants.
- Ensuring the stability of the indoor environment.
- Regulating body temperature (thermoregulation).



# Balance between water intake and water output

**Intake** in the form of fluids (about 1.5 litres) and water-rich foods (about 1 liter), e.g. fruit, vegetables, milk, etc.

Renal **excretion** in the form of urine, through the digestive tract in the form of stool, through the lungs (breathing) and through the skin (sweating) (about 2 - 2.5 litres).

It depends on the temperature and humidity of the environment, body temperature, fluid intake, physical activity or the presence of disease.

# 4.2

# Lack of fluids

## Feeling thirsty

- An important signal to the body to avoid water deficiency in the body (dehydration).

## Dehydration

- A condition of water deficiency in the body, which may be caused by insufficient water intake or increased water expenditure (loss).

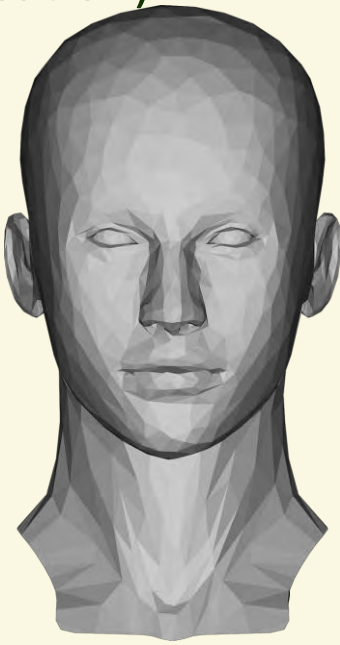
Water loss can also be associated with mineral losses, especially **sodium**, which can lead to the disruption of the body's internal environment and to other health disorders.

# Manifestations of mild dehydration

- Feeling thirsty.
- Dry lips, dry skin.
- Fatigue, headache.
- A drop in blood pressure, fainting.
- Dark color of urine.

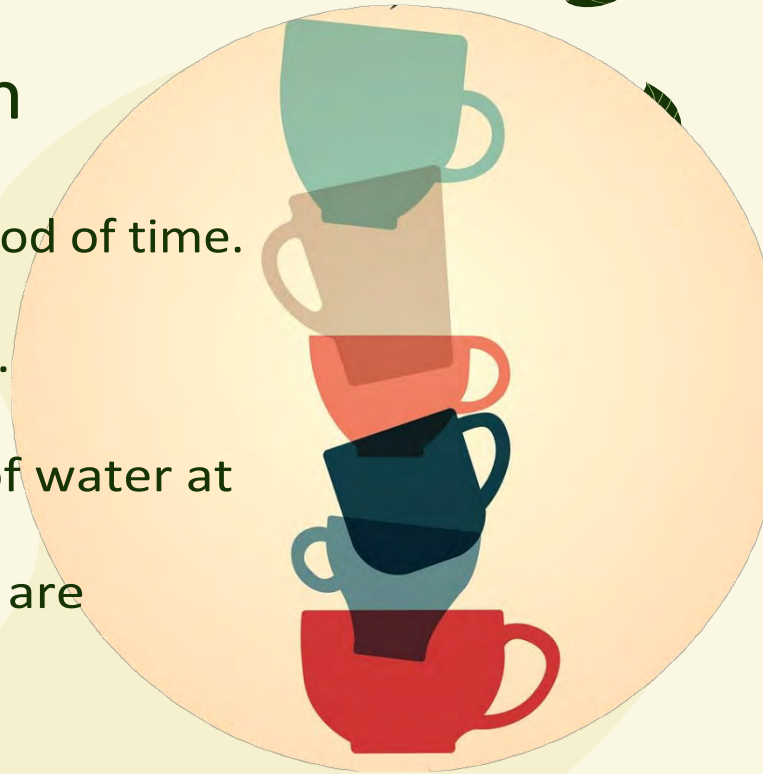
# Manifestations of long-term dehydration

- More serious health problems.
- Difficulty with digestion, constipation (problems with defecation).
- Increased fatigue.
- Serious organ disorders, e.g. kidney.
- Rapid and shallow breathing, pale and inflexible skin.
- Muscle cramps, rapid pulse and exceptionally even death.



# Excessive water consumption

- Excessive water/liquid intake in a short period of time.
- This condition is called water intoxication.
- The body cannot process large amounts of water at once. The kidneys, other organs and cells are mainly burdened.
- This condition can be very dangerous and even fatal.

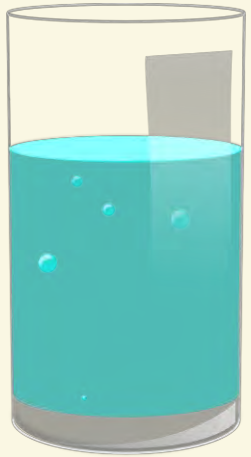


# 4.3

# Daily drinking regime

# Proper daily drinking regime

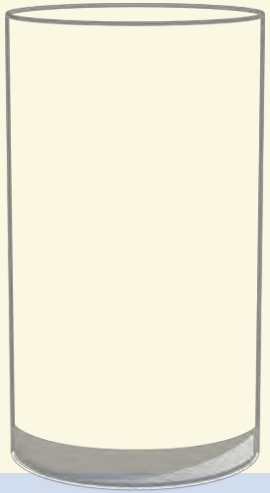
- It is the intake of sufficient and necessary amounts of water or other appropriate fluids per day.
- The amount of fluids needed is individual for people.
- The daily water requirement for adolescents and adults is usually around 2 litres for girls and women and around 2.5 litres for boys and men. Even more when the temperature outside is high, during sports, physical work or for some illnesses.



**Formula for calculating the daily fluid requirement of a person: around 40 ml of fluid per 1 kg of body weight.**

# The human body cannot "drink itself into a reserve"

- Fluids should be taken at regular intervals evenly throughout the day.
- It is advisable to drink **5 - 8 glasses* of** suitable fluids, especially water, during the day.



**The daily fluid intake should be sufficient to replace the amount of water the body loses each day.**

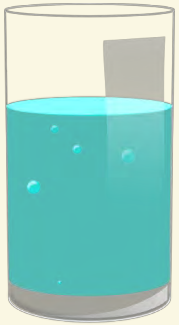
*Cup =200 ml

# 4.4

# Suitable and inappropriate drinks

# The basis of a proper drinking regime should be non-caloric fluid

- **Drinking tap water is the most suitable beverage for a proper drinking regime.**
- The quality and safety of drinking water is monitored.
- Drinks should be at room temperature. Beverages that are too cold and carbonated as well as too hot are not suitable.
- The WHO* is paying attention to the presence of **microplastics** in drinking water, beverages and food packaged in plastic.



**Drinking water is the most suitable beverage for a proper drinking regime.**

**Poorly mineralised** natural spring water.

**Unsweetened** fruit or herbal teas.

**100%** fruit or vegetable juices - occasionally, no more than 100-150 ml and preferably diluted with water.

# What does not belong in a proper drinking regime?

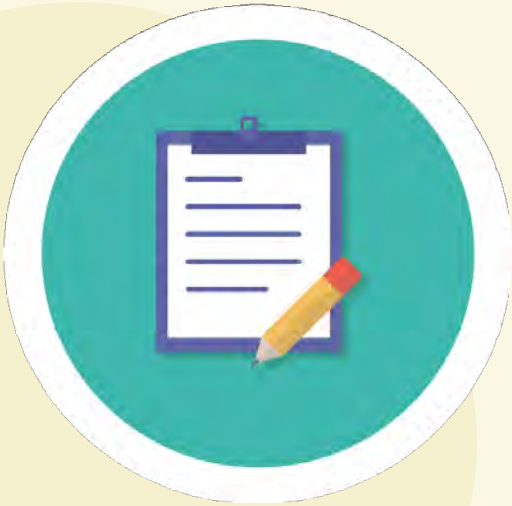
## Drinks with added sugar or sweeteners

- Lemonades
- Fruit drinks
- Vitamin water
- Energy and sports drinks
- Alcoholic beverages
- Drinks containing caffeine


# 4.5

Follow
and assessment of the quantity and quality of fluid intake

# Monitoring water intake



- Diary or mobile app.
- **Recording:**
  - the amount and type of drinks and food consumed,
  - physical activity performed (sport, work),
  - outside temperature and time of consumption.
- **Assessment of the quantity and appropriateness of** fluid intake.

It is important for health to have good and natural habits how much, when and what to drink.

# The amount and colour of urine is also a good indicator of a sufficient drinking regime

Too much waters

Adequate water intake

Insufficient water intake

Dehydration

# Thank you!

Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools) Project
Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Food and drink portions
# Lesson 5

Minárik Peter, Mináriková Daniela, Sremaňáková Jana

# Ports
# food and beverages

Minárik Peter - Mináriková Daniela - Sremaňáková Jana

# Food and drink portions

01

## Guide and recommendations

the correct portion sizes

02

## How to eat:

Fruit, vegetables and salads

CZ bread, cereals, pasta, rice and potatoes

03

## How to eat:

Milk, milk products and cheese

Meat, poultry, fish, eggs, beans and nuts

04

## How to eat:

Fats, oils and spreads

Foods rich in fats, sugars and salt

# Guide and recommendations on correct portion sizes

01

# Portion guide

- **In everyday life, you portion your food and meals:**
  - **is usually determined by the individual person himself.**
- **Hunger itself has a significant impact on portion size.**
- **There are, however, other important influences,**
  - **the size of food packaging,**
  - **the amount of food on the plate**

It is a well-known fact that over the past decades the **serving portion sizes in restaurants have been gradually increasing**. The so-called **XXL packs of** many foods are also very popular, with a **better price** than the same foods in smaller packs.

**A well-balanced and healthy diet** is based, among other things, on:
- **making the right choices about** food, food and drink,
- **a reasonable quantity** and
- **the appropriate frequency of** their consumption.

# Portion guide

**Visual aids to healthy eating:**

— they also include illustrative examples of the portion sizes of individual foods.

**Suggestions for practical portion sizes for food, meals and drinks:**

— are developed for healthy adults.

**Different people may have different needs due to many factors energy and nutrient intake,**

— which translates into different dietary requirements.

**Healthy individuals nevertheless have comparable requirements:**

— for various types of food and beverages:

— generalisations in the development of dietary recommendations and their visual tools are therefore justified.

# What is the correct portion size?

- **Justified portion sizes in illustrative dietary instructions**
  **Recommendations:**
  — refer to a daily energy intake **of 8 ß00 fiJ/2 000 fical**,
  — which is an estimate of a reasonable daily energy intake for an "average" healthy woman.

- **For a physically particularly active person or a person with a tall stature:**
  — the need for daily energy intake may be **higher**.

- **At lower body height and when there is a need to reduce body weight:**
  the need for daily energy intake may be **lower**.

- **Individual assessment of daily caloric intake**
  — and the associated number of justified food portions,
  — is needed in every individual.

# Hands, palms, fingers, cups, glasses, spoons and teaspoons

- **Hands, palms, fingers, cups, glasses, spoons and teaspoons:**
  - — are simple aids for estimating portions and
  - — easy to remember means.

- **Taller people usually have bigger hands:**
  - — and therefore miss out on slightly **larger portions**.

- **Shorter people usually have smaller hands**
  - — and therefore receive **smaller portions**.

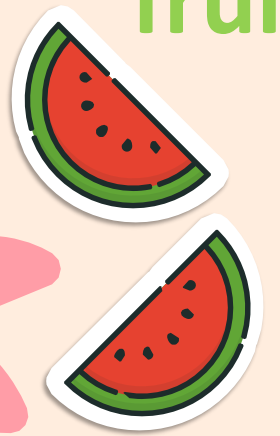
- **If cups and glasses are used** as illustrative measuring cups for certain foods (drinks, cereal mixes, rice, corn, pulses), a **250-300 ml cup** and a **200 ml glass** are usually used.

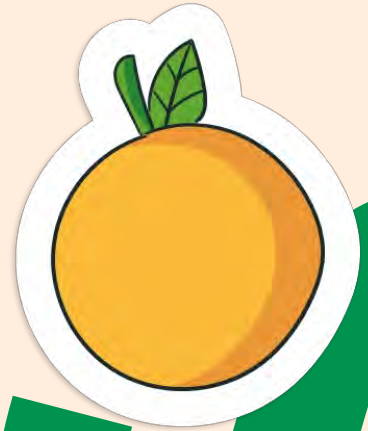
- **A tablespoon** has a volume of **10 ml** and a **teaspoon 5 ml**.

- **Weights are also given in the tables:**
  - — individual foods and their caloric content.

02A

# How to eat
## fruit and vegetables





# How to eat: fruits and vegetables?

**Vegetables and Fruits Are the Foundation of Daily Nutrition.**
They should make up at least one-third of your daily diet. For fruits and vegetables, including leafy greens, the following portion recommendations apply:

- Eat a variety of different types of vegetables and fruits.
- Consume at least 5 portions of non-starchy vegetables and 2 portions of fruit daily.
- 5 portions of vegetables is the minimum required amount—more is better.
- More vegetables than fruits should be consumed. A fruit portion does not replace a vegetable portion.

- A standard portion of vegetables is 80 g and of fruit is 150 g. The recommended daily intake is at least 400 g of vegetables and 300 g of fruit.

- A standard vegetable portion (80 g) and of fruit (150 g) is approximately equivalent to **1 glass =200 ml**:
1 larger fruit slice (e.g., water melon, pineapple)
1 medium-sized whole fruit (e.g., apple, pear, banana, orange, nectarine, peach)
2 smaller whole fruits (e.g., tangerine, plum, kiwi)

Image credit: British Nutrition Foundation

# How to eat: fruits and vegetables?

- ½ cup of berries
- ¼ cup of raw, cooked, frozen, or canned vegetables (e.g., carrot, parsley, parsnip, broccoli, cauliflower, mushrooms, asparagus, cabbage, kale, Brussels sprouts, green peas, zucchini, eggplant)
- 1 cup of leafy greens (e.g., lettuce, arugula, spinach) or vegetables like tomato, cucumber, onion, green beans, radish
- ½ avocado
- 5 canned olives

**Maximum 1 of the recommended 5 vegetable portions and 2 fruit portions per day** can be consumed in the following forms:

- ¾ cup (150 ml) of unsweetened vegetable juice or 100% fruit juice
- ⅔ cup (130 ml) of fruit or vegetable smoothie
- ½ cup (30 g) of dried fruit

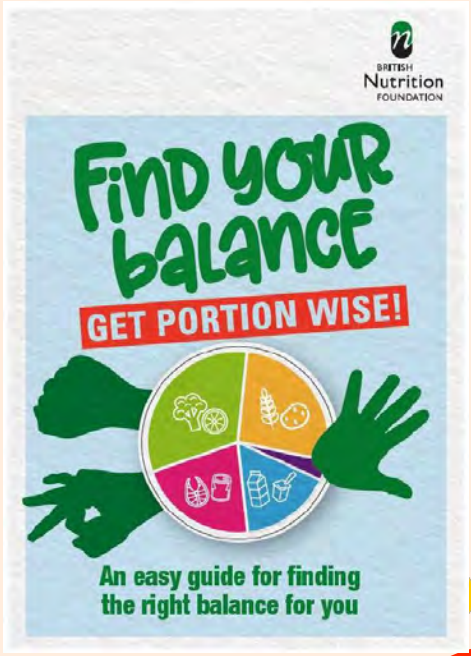
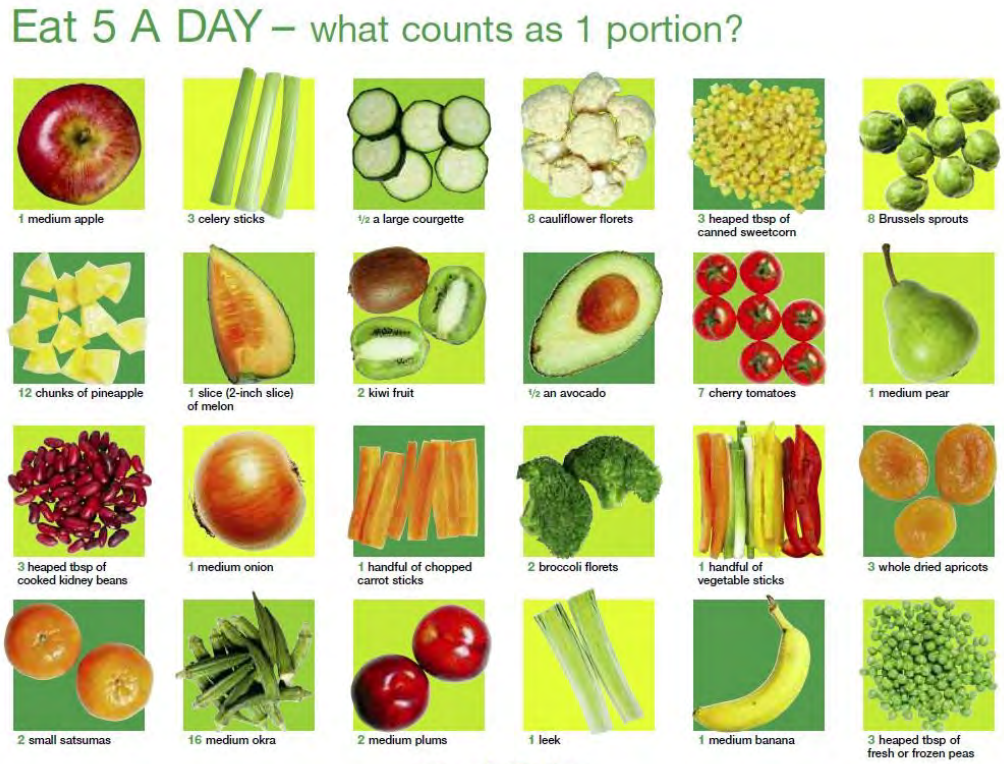


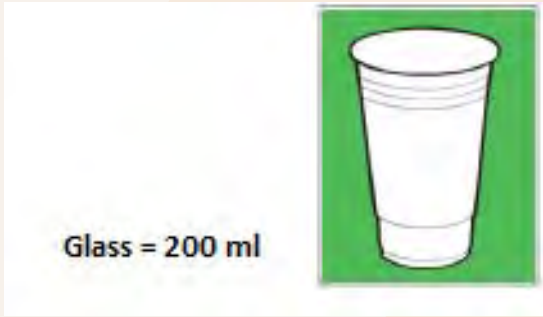

Image credit: British Nutrition Foundation

# What 1 portion of fruit and 1 portion of vegetables looks like



# Vegetables and fruits: remember!

- Vegetables and Fruits Are the Foundation of Daily Nutrition They should make up at least one-third of the daily diet.
- Eat a variety of colorful fruits (this also applies to vegetables).
- Consume at least 5 portions of non-starchy vegetables and 2 portions of fruit daily.
- More vegetables than fruits should be consumed - a fruit portion does not replace a vegetable portion.




- **One standard portion of vegetables = 80 grams**
- **One standard portion of fruit = 150 grams**
- **Recommended daily vegetable intake = 400 grams**
- **Recommended daily fruit intake = 300 grams**

**Maximum one of the recommended 5 vegetable portions and 2 fruit portions per day** can be in the following forms:
¾ cup (150 ml) of unsweetened vegetable juice or 100% fruit juice
½ cup (130 ml) of fruit or vegetable smoothie
½ cup (30 g) of dried fruit

EAT VEGETABLES AND FRUIT DAILY. EAT MORE VEGETABLES THAN FRUIT.

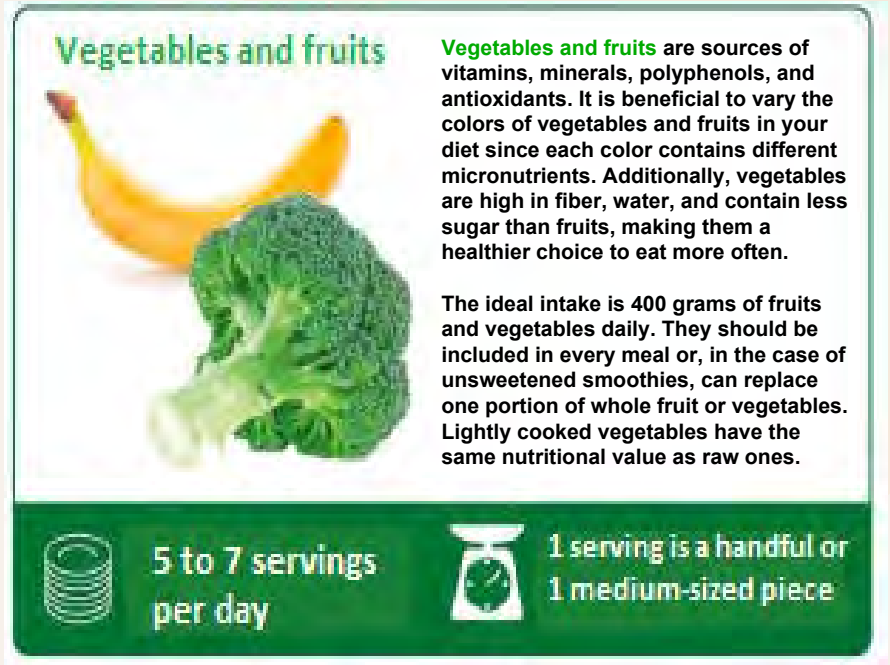
A PORTION OF FRUIT DOES NOT REPLACE A PORTION OF VEGETABLES. MORE IS BETTER.

# Vegetables and fruits: remember!

**Recommended Daily Intake:**
**5 portions of non-starchy vegetables**
**2 portions of fruit**

**One Standard Portion of vegetables: 80 grams and Fruits: 150 grams**

- ½ cup of raw, cooked, frozen, or canned vegetables (e.g., carrot, parsley, broccoli, cauliflower, asparagus, cabbage, kale, Brussels sprouts, green peas, zucchini, eggplant)
- 1 cup of leafy greens (e.g., lettuce, arugula, spinach, tomato, cucumber, green beans, radish)
- 1 large fruit slice (e.g., melon, pineapple)
- 1 medium-sized fruit (e.g., apple, pear, banana, orange, nectarine, peach)
- 2–3 small fruits (e.g., mandarin, plum, kiwi)
- 5–15 small fruits or a handful (e.g., grapes, cherries)
- ½ cup of berries (e.g., raspberries, currants)



02B

# How to eat wholemeal bread, cereals, pasta, potatoes and rice

Image credit: Freepik.com, by @macrovector

# How to eat:

## wholemeal bread, cereals, pasta, potatoes and rice?

- **Starchy foods are a natural part of a good diet** and of a healthy life for every person.
- Bread, pastries, rice, pasta, cereals, potatoes and other starchy foods **are recommended**.
- **It is recommended to prefer whole grain cereal foods** over cereal foods made from refined flour. **This includes**, in particular, wholemeal bread and wholemeal pastries, crispbreads (Knäckebrot), wholemeal pasta, wholemeal, brown or wild rice, oatmeal or other cereal flakes, unsweetened muesli.
- **Wholegrain cereal foods contain more fibre than white or refined** cereal foods and often contain **more B vitamins**.
- **Wholegrain foods are a good source of fibre** and **should make up** up to **half of the cereal foods** consumed. Vegetables, fruits and legumes are also another source.


Image credit:
Freepik.com

**The recommended daily fiber intake is 30 g** for both men and women.
- Consuming whole grain foods reduces the risk of type 2 diabetes, cardiovascular diseases, and colorectal cancer.

**Recommended Portions 3 – 5 standard portions**
Physically active individuals and young adults: at least **6 – 7 portions**

**Recommended Portion Sizes for Starchy Foods** (Grains, cereals, and rice) **1 glass = 200 ml**

- 2 slice of whole grain bread or baked goods **(1 slide = 40 g)**
- ½ cup of unsweetened oatmeal or whole grain cereals
- ½ cup of cooked whole grains (e.g., bulgur, couscous, barley, quinoa)
- 1 cup of cooked rice, pasta, or other cooked grains
- 2 medium-sized potato or 4 small potatoes or a glass of sweet potatoes


**One standard portion** provides **630 kJ / 150 kcal.**
- When consuming breakfast cereals, check the nutritional values and ensure they contain at least 6 g of fiber per 100 g while keeping added sugar content low.
- For bakery products, choose those without added fat and sugar.
- Limit fried and deep-fried starchy foods as much as possible.

**Starchy sides should not exceed ¼ of the plate. It is recommended to replace them partially with vegetables.**

03A

# How to eat

## milk, dairy products and cheese

Image credit: Freepik.com, by @macrovector

# How should I eat: milk, dairy products and cheese?

**Dairy Product Recommendations**

**For the dairy food group, which includes milk, dairy products, cheeses, and plant-based dairy alternatives, the following portion guidelines are recommended:**

**- Milk and dairy products are important sources of calcium and protein. Adequate calcium intake is difficult to achieve from non-dairy sources alone.**

**- Milk and dairy products should be consumed daily.**

**- Prefer milk and dairy products with reduced or low fat content.**

**- Consume low-fat milk, low-fat yogurts, and other low-fat dairy products more frequently than cheese. Cheese should be consumed in smaller amounts.**
**- Fermented dairy products daily (e.g., yogurt, kefir, sour milk) are recommended. These products should not contain added sugar and should be consumed in a diluted form when possible.**

**- Recommended Daily Portions: Adults (19 – 65 years old): 3 portions per day**
**Children and teenagers (6 – 18 years old): up to 5 portions per day**
**Adequate and regular consumption is particularly important for seniors and women.**

Image credit:
Freepik.com

**One Standard Portion Includes:**

- **Milk** (drinking milk, sour milk, fortified soy drink): **1 portion = 200 ml (max. 250 ml)**

- **Yogurt: 1 portion = 125 g – 150 g** (flavored and sweetened 125 g, natural without added sugar 150 g), example: 1 yogurt cup (125 g, 150 g)
- **Curd, Cottage Cheese: 1 portion = 75 – 125 g,** example: 1 cottage cheese cup or a standard pack of curd (250 g pack is for 1 portion approximately 1/3)
- **Cheese: 1 portion = 25 g (15 – 30 g),** example: about 2 finger-width slices
- Hard Cheese (high in fat and salt) should be consumed rarely and in small amounts.

**Milk products with high content of fat and sugar** should be consumed as a dessert rather than as a daily dairy product.

- **For vegetarians, 3 portions of dairy products per day** are recommended. In a vegan diet, 3 portions of plant-based dairy alternatives should replace dairy.

Image credit: Freepik.com

03B

# How to eat

## meat, poultry, fish, eggs, beans, nuts



Image credit: Freepik.com - by @brgfx
Images courtesy of Freepik.com - by @macrovector

# How should one eat: meat, poultry, fish, eggs, beans, nuts?

**Protein-Rich Food Group Recommendations**

This food group includes meat, poultry, fish, eggs, legumes, nuts, and plant-based seeds. The following recommendations apply:

- All foods in this group are rich in high-quality proteins, both animal and plant-based. Proteins are essential for growth, tissue repair, and body function. These foods also contain many beneficial nutrients and fats.

•Each person should consume something daily from this group.

Recommended Daily Intake: 2 portions per day

Standard Portion Sizes:

- 50 – 75 g (palm-sized portion) of **cooked lean meat** (beef, pork, lamb, veal, lean minced meat)
- 50 – 75 g (palm-sized portion) of cooked **poultry**
- 100 g of cooked **fish**
- 2 whole eggs
- ¾ cup (200 ml) of **cooked beans, peas, or lentils**
- 100 g of **cooked soybeans or tofu**
- 40 g of unsalted **nuts or seeds**


Image credit: Freepik.com - by @brgfx
Images courtesy of Freepik.com - by @macrovector

# How should one eat: meat, poultry, fish, eggs, beans, nuts?

**Weekly Protein Intake may include:**

- 2–3 times lean meat
- 2–3 times poultry
- 1–2 times fish (including at least one serving of fatty fish)
- 1–2 times legumes, eggs, or nuts

- Protein-rich foods are a variable group and contain a variety of nutrients.

- **Lean Unprocessed red meat** includes pork, beef, lamb, and game meat. Good source of heme iron and protein.

- Recommended intake: **2–3 times per week.**
- **1 portion = 50 – 75 g (palm-sized portion)** of cooked lean meat.

## Poultry

- Contains easily digestible proteins and heme iron, though in smaller amounts. Iron is found in darker poultry meat, such as thighs.
- The most commonly consumed poultry meats are **chicken and turkey.**

- Most of the fat is found in the skin, so it should be removed before consumption. Goose and duck meat, as well as chicken wings, contain more fat.
- Recommended intake: **2–3 times per week.**

**1 portion = 50 – 75 g** (palm-sized portion) of cooked skinless poultry.

Image credit: Freepik.com

## Eggs

- A good source of **protein** and non-heme **iron.**

- Egg white contains no fat.

- **Egg yolk** contains fat, vitamin A, vitamin D, and cholesterol.

- In healthy adults, daily consumption of egg yolk does not affect blood cholesterol levels.

- Recommended intake: **1–2 times per week.**

- **1 portion = 2 eggs**

Image credit: Freepik.com

## Legumes

**Legumes (lentils, peas, beans, chickpeas, soy) provide high-quality protein, non-heme iron, low fat content, and high fiber.**

**If choosing canned legumes, opt for those with low salt content.**

**- Legumes are a good plant-based alternative to meat.**

**- Recommended intake: 1–2 times per week.**

**-1 portion = ¾ cup (200 ml) of cooked legumes, soy, or tofu.**

Image credit: Freepik.com

## Nuts and Seeds

- High in protein and fiber, as well as healthy unsaturated fats beneficial for health.

- Consume only in small amounts and unsalted.

- 1 portion = 40 grams


Image credit: Freepik.com

**Consume plant-based protein foods** (legumes, soy, and soy products) more often **than animal proteins from meat.**

A diet with a predominance of plant-based foods (vegetarian diet) one or two days a week is beneficial for everyone.

**Processed meat and meat products**, especially from red meat, should be consumed **only occasionally and in small amounts.**

- Limit the consumption of processed poultry meat, such as nuggets, strips, and other fried products.
Meat, fish, legumes, and soy products, such as tofu, are usually consumed as main meals.

- Nuts and seeds are typically eaten as snacks or as ingredients in other dishes (salads, pasta, etc.).

- In dietary styles that exclude animal products, it is necessary to ensure adequate intake of iron and vitamin B12 through the proper combination of plant-based foods, or if needed, by supplementing with nutritional supplements.

**Meat preparation:** **High cooking temperatures** (e.g., during grilling, frying, or roasting) create compounds on the surface of the meat that are linked to cancer risk, especially colorectal cancer. **This risk can be reduced by the following measures:**

- **Prefer steaming and boiling** over grilling and frying.

- **Avoid direct contact of food with flames** during grilling by using a tray or aluminum foil between the food and the heat source.

- **Prevent fat from dripping into the flame,** which creates smoke containing harmful substances.

- **Remove charred parts of the meat,** as they concentrate harmful compounds.

- **Do not use drippings from cooked meat.**

04A

# How to eat

## fats, oils and spreads

Images courtesy of Freepik.com, by @macrovector

# How should one eat: fats, oils and spreads?

**The fat food group, consisting of fats, oils, and spreads, follows these recommendations:**

1. **Fats** in this standard include animal, plant-based, or mixed fats that are solid at room temperature (so-called "butter-like" consistency).
2. **Oils** refer to fats that remain liquid at room temperature (above 20°C).
3. **Spreads** are products where fats or oils are a major component. They can be spreadable and used for spreading on bread. Some may have a spreadable but firm consistency (e.g., butter and margarine), while others are semi-solid (e.g., dressings, mayonnaise) or liquid (e.g., oil-based spreads). The amount of fat and energy content varies depending on the type. Regular butter typically contain **80 g of fat per 100 g.** **Low-fat spreads** contain about **20 to 40 g of fat per 100 g.**
4. **The fat group** (fats, oils, and spreads) includes the following products:
   - Oils commonly consumed cold (e.g., butter, lard, bacon, tallow, cocoa butter).
   - Fats used for cooking and frying (e.g., margarine, coconut fat, palm oil).
   - Plant-based oils (e.g., olive oil, rapeseed oil, sunflower oil, linseed oil, sesame oil).
   - Spreadable products (e.g., butter-based spreads, lard-based spreads).
   - Other fat-based products (e.g., mayonnaise, dressings, creamy spreads for spreading, cooking, and baking).

Obrázky: Freepik.com, by @macrovector

5. **In the Slovak food pyramid**, fats, oils, and fat-based spreads are placed on **the 4th level** of the pyramid.

6. **The recommended number of servings** for the food group of fats, oils, and spreads is more precisely described by phrases such as: "**consume only in very small amounts," "use in the smallest quantities," or "use in moderation."** However, these recommendations should be supplemented with illustrations of the **portion sizes of fats, oils, and spreads, highlighting that fats have a very high energy content and are present in both visible and hidden forms in foods.** These are found in other food groups (nuts, seeds, meat and meat products, dairy products, eggs) and in entire food groups rich in fats and sugars, which make up the 5th level of the Slovak food pyramid.

7. **The portion size is suggested to be indicated in grams (g)** as well as in visual and easily **understandable examples.**
For solid fats and spreads, this can be **10 g** or one small package ("**mini butter" or "mini margarine**").
For liquid forms (oils) or semi-solid forms (mayonnaise, dressings), this can be **5 ml or one teaspoon.**

04B

# How to eat foods rich in fats, sugars and salt

Images courtesy of Freepik.com, by @macrovect

# How to eat: foods and drinks rich in fats, sugars and salt?

- **Frequent consumption of these foods and large portions are not beneficial for health.** They contribute to weight gain, obesity, and many serious chronic diseases.

- **Their intake should be reduced by everyone** who wants to eat wisely and prevent diseases.

- **Foods and beverages high in fat, sugar, and salt are not part of a diet beneficial to health.** The body does not need them.

- Foods and beverages high in fat, sugar, and salt should **be consumed only occasionally and in small amounts.** Maximum 1–2 times per week.

- **Intake of free sugars** should not exceed 10% of total daily energy intake.

- **Intake of total fats** should not exceed 30% of total daily energy intake.

- **Intake of saturated fatty acids** should not exceed 10% of total daily energy intake.

- **Intake of trans fatty acids** should not exceed 1% of total daily energy intake.

- **Salt intake in adults should be less** than 5 grams per day (2 grams of sodium), which corresponds to 1 teaspoon of table salt. This amount includes total salt intake, both the salt added directly to meals and the salt present in other processed foods.

- **A suitable cooking method** is mainly **boiling in water** or steaming. These cooking methods should replace frying.

- **Salting and seasoning food is best done after cooking.** It is recommended to use herbs and spices without added salt.

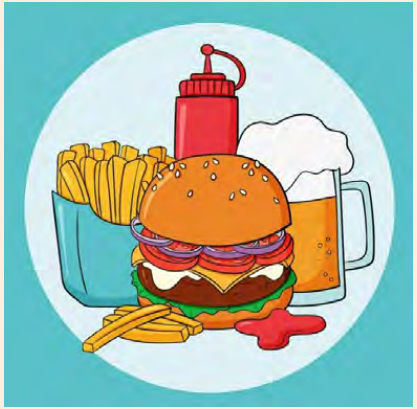
- **Sweets** should **be replaced with fruit** and low-fat unsweetened dairy desserts.

- **Salty snacks should be** replaced **with unsalted nuts** (in the recommended amount).

- **It is recommended to prefer canned products in their own juice,** without added salt and sugar.

- **Reduce the amount of sugar used in baking and cooking.**

- **It is recommended to consume milk and dairy products with a low fat content and to replace animal fats with plant-based fats and oils.**



- It is recommended to quench thirst with water instead of sugary drinks, or with unsweetened beverages, tea, etc.

- Ready-made meals, processed foods, and fast food should be consumed only occasionally.

- When shopping and selecting food, attention should be paid to its nutritional composition.

| Food Groups | Standardised Portions<br>Use standardised utensil sizes (e.g. ladle sizes) |
|---|---|
| *Vegetables, salad and fruit<br>Provide 5 portions per day | 1 portion is equal to 80g<br>> 1 medium sized fruit – apple, orange, pear or banana<br>> 2 small fruits – plums, kiwi or mandarin oranges<br>> Small fruits – 6 strawberries, 10 grapes or 16 raspberries<br>> ½ cup of cooked vegetables – fresh or frozen<br>> 1 bowl of salad – lettuce, tomato, cucumber<br>> 1 bowl of homemade vegetable soup<br>> 150mls unsweetened fruit juice |
| *Cereals and breads, potatoes, pasta and rice<br>Provide 5 portions per day | 1 portion is equal to:<br>> 2 thin slices of white or wholemeal bread<br>> 1 torilla wrap<br>> 1 ½ slices wholemeal soda bread or 1 pitta pocket<br>> 40g dry porridge oats<br>> 45g flaked type breakfast cereal<br>> 125g cooked rice,<br>> 100g pasta, noodles, or cous cous<br>> 2 medium potatoes (200g) or 4 small potatoes |
| *Milk, yogurt and cheese<br>Provide 3 portions per day | 1 portion is equal to:<br>> 200mls milk<br>> 25g cheese<br>> 125g yogurt |

| Food Groups | Standardised Portions<br>Use standardised utensil sizes (e.g. ladle sizes) |
|---|---|
| Meat, poultry, fish, eggs and beans<br>To meet the nutrition standard for protein (90g per day), 35-42g protein must be provided per day from meat, fish, chicken, eggs and beans<br>Protein containing foods should be provided at 2-3 meals each day | Each of these foods provides 7g protein:<br>> 1 egg<br>> 25g roast chicken<br>> 22g roast beef<br>> 25g cooked roast pork<br>> 30g cooked minced beef<br>> 30g baked salmon<br>> 30g baked cod<br>> 100g cooked beans<br>These foods must be weighed after cooking to ensure that specified weight is given at each meal for example to provide 28g protein from roast chicken, cooked portion should weigh 100g |
| Foods and drinks high in fat, salt and sugar | Portions and types of foods used will be determined by the nutrition standards for the individual therapeutic and texture modified diets, see Section 4.0 and 5.0 |

*DOH, HEG, 2016.

**Portion size guide - Ireland example**
*Department of Health. The Food Pyramid.www.healthyireland.ie. 2016*

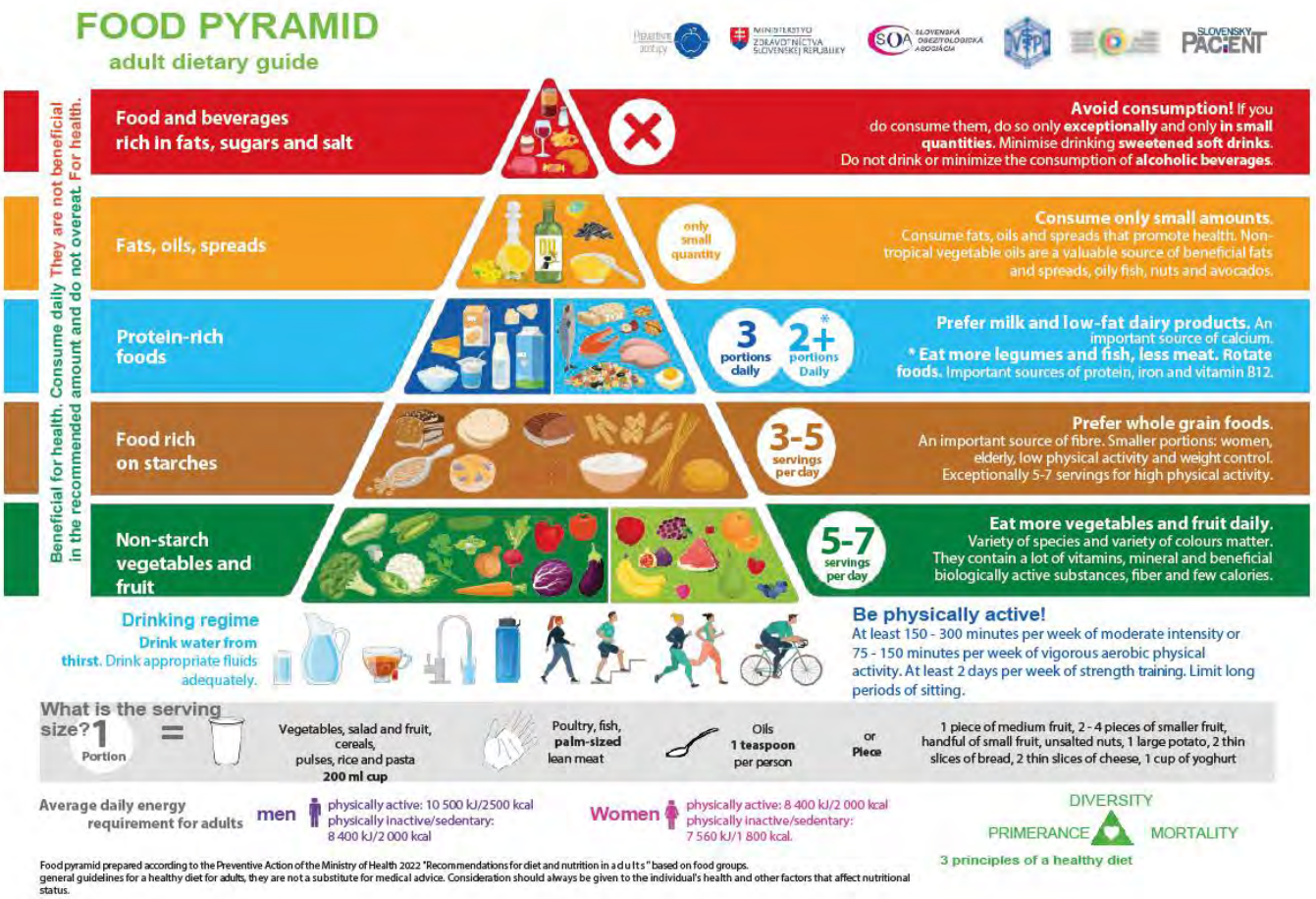
**Number of servings of wholemeal cereals, breads, pastries, pasta, potatoes and rice by age and sex**

| Active | Child | Teenager | Adult (age19-50) | Adult (over 51) |
|---|---|---|---|---|
| Woman | 3 – 4 | 4 | 4 – 5 | 3 – 4 |
| Man | 3 – 5 | 5 – 7 | 5 – 7 | 4 – 5 |

| Inactive | Teenager | Adult (age 19-50) | Adult (over 51) |
|---|---|---|---|
| Woman | 3 | 3 – 4 | 3 |
| Man | 4 – 5 | 4 – 6 | 4 |

**The first official Slovak Food Pyramid**

Source*:*
*MZSR 2023*




Source : https://www.health.gov.sk/?Postupy-Prevencia

Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools)
Project Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Thank you

Project: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools) Project
Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Healthy eating
# Lesson 6

Minárik Peter, Mináriková Daniela, Sremaňáková Jana

# Beneficial to health catering

# Content



# 01 Why we eat

# Key facts about healthy eating

Explanation of the terms 'healthy eating' -
"healthy eating" - "healthy diet" - "healthy nutrition".

Healthy eating: is the most correct and correct concept

Healthy eating: it is shorter but concise and in the world the accepted name: *"healthy diet"*.

**It is a takfi diet, the consumption of which:**

— supplies the body with **all the** necessary **nutrients**,
— **protects** against malnutrition,
— **promotes health**,
— reduces the risks of **chronic** diseases
(obesity, diabetes, cancer, heart and blood vessel disease)

# A full varied diet and healthy nutrition must meet several basic criteria:

- **Supports health**
- **Protects against all forms of malnutrition**
- **Reduces the risk of chronic non-communicable diseases**
- **Provides the body with all essential and additional nutrients in optimal doses and ratios, which are necessary for proper bodily function**

World Health Organization

# Key facts about healthy eating

- **Unhealthy diet and lack of physical activity:**
  — are major global  healthrisk.

- **With healthy eating you need to:**
  — **start** from **the early age of** the child.

- **Breastfeeding itself supports:**
  — healthy **growth** and overall **development of** the child, cognitive - mental abilities of the child,
  — is also **beneficial** for his **health in later life**.

- **Reduces the risk of obesity and other chronic** non-infectious diseases **in later life**.

# Basic prerequisites for healthy eating

## Healthy eating:

- **They do not promote unwanted weight gain.**
  — **energy intake and expenditure** (calories) and should be **in equilibrium** in a healthy person.

- **Diet is beneficial to health:**
  — **high** in whole grains, vegetables, fruits, legumes and nuts,
  — **low** in salt, free sugars and fats, especially saturates and trans fats.

- **The benefits of healthy eating are evident:**
  — in **better** learning **outcomes**, labour productivity and
  — in **better health** throughout an individual's lifetime.

- **In addition, a healthy diet is more environmentally sustainable** because it connects:
  — with lower greenhouse gas emissions and
  — with lower consumption of fresh water and soil.

# Why do we actually eat?

Food is one of the basic conditions of human existence.

- man for his existence necessarily needs to receive food.

The function and purpose of food intake:

- is the supply of energy and nutrients,
- all-round support of the body's physical and mental functions.

## Importance and Use of Nutrition for Humans

- **Building, renewal, and repair of cells, tissues, and organs.**
- **Energy (work, movement, transport, digestion, and other functions).**
- **Physical growth and development (intrauterine development, childhood, adolescence).**
- **Mental and psychological activities.**
- **Immunity and inflammation.**
- **Regulatory and signaling functions.**
- **Hormonal and endocrine functions.**
- **Reproduction.**
- **Blood formation and hemostasis.**
- **Digestion – digestion and absorption.**
- **Breathing – respiration.**
- **Excretion – elimination.**
- **Wound healing.**

# 02

# What we eat

# What we eat

- We must take **food** during
  - **of a lifetime.**
- **We eat a diet that is compliant:**
  - from a variety of foods,
  - of animal or vegetable origin.
- **Food** is one of **the basic necessities** of human **life**.
- **Food contains nutrients**, which are substances
  - **essential for** tissue growth and repair and
  - regulation of all life processes metabolism.

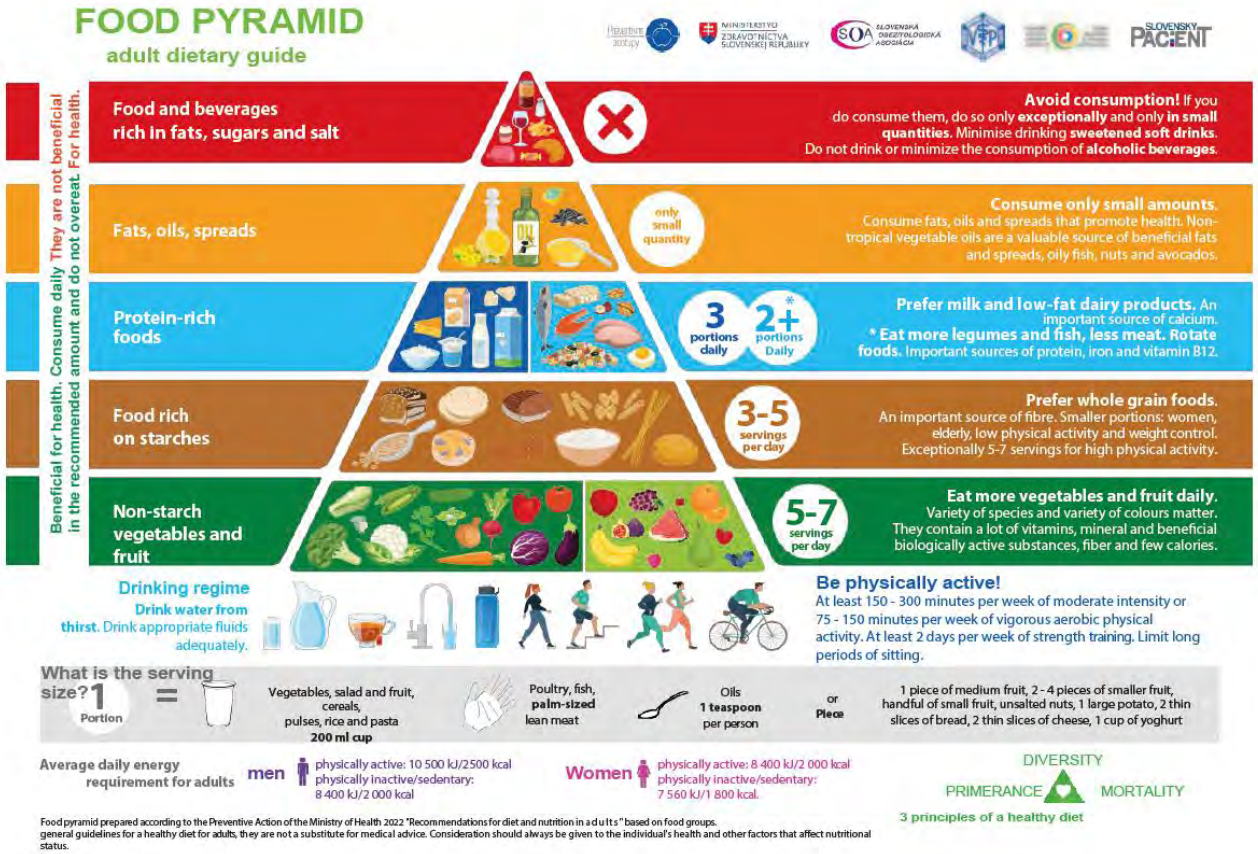
# What we eat: food division

**All foods can be classified into several food groups based** on their origin and nutrient content. In principle, foods are divided into the following groups:

1. Water (drinking, spring, mineral)
2. Vegetables – non-starchy (leafy, fruit, root, cruciferous vegetables)
3. Fruits (fruit, berries, citrus)
4. Foods rich in starch (grains, potatoes, rice, corn)
5. Milk, dairy products, and plant-based dairy alternatives (curd, cottage cheese, cheese, yogurt, acidophilus milk)
6. Protein-rich foods – non-dairy (eggs, fish, seafood, poultry, meat, legumes, soy, nuts, plant seeds)
7. Fats, oils, and spreads (plant-based spreadable fats)
8. Foods high in fat, sugar, and salt (processed and ultra-processed foods)

- **Current guidelines on flexible catering:**
  - are built on **food groups**.
- **Foods that promote health:**
  - it is recommended to consume **more frequently**
  - and/or in **larger portions**:
  - vegetables, fruits, whole grain cereals, legumes, low-fat dairy products, fish, and more.
- **Foods that have a negative impact on health:**
  - it is recommended to consume **less frequently**
  - and/or in **smaller portions**.
- **Visual consumer aids on healthy eating**
  - divides foods into several food groups, and they are:
  - **food pyramids** or
  - **"healthy" plates**.

| | | | |
|---|---|---|---|
| **Foods and drinks rich in fats, sugars, and salt** | They are not necessary, on the contrary, they have a negative impact on health. | Contain a lot of energy (calories), fats, trans fats, added sugars, and salt. | **Avoid consumption. If you consume, do so only occasionally and in small amounts.** |
| **Fats, oils, spreads** | Consume fats, oils, and spreads that support health. | Plant-based unsaturated fats, oils, and spreads have a favorable effect on health. | **Only in small amounts.** |
| **Protein-rich foods:** Meat, fish, eggs, dairy products, nuts, and seeds | Eat more lean meats and fish, less red meat. | **An important source of protein, iron, and vitamin B12.** | **2 portions daily.** |
| **Milk, dairy products, and plant-based dairy alternatives** | Reduce full-fat dairy products. | **An important source of calcium.** | **2 – 3 portions daily.** |
| **Foods rich in starch:** Grains, potatoes, rice | Choose whole-grain variants of foods. | **An important source of energy and fiber.** | **3 – 5 portions daily.** |
| **Vegetables and fruits** Non-starchy vegetables, fruits, and juices | Consume a variety of vegetables and fruits. | Contain a lot of fiber, vitamins, and minerals, while having little calories. | **5 – 7 portions daily.** |
| **Drinking regime** | Drink water when thirsty. Do not drink or limit alcoholic beverages. | | |




Source : https://www.health.gov.sk/?Postupy-Prevencia

# Slovak Food Pyramid

MZSR, 2023

UK

## ViSUAL AID:

## THE EATWELL GUIDE

## 2016


https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/

# Importat things to say to students:

- **Energy:** your body needs to **recharge** every day **Energy**.
- **Nutrients:** in addition to energy, your body requires a constant supply of many **useful nutrients** that are essential for the proper functioning of your body.
- **Water:** for your body to function properly, you need to **drink** extra **water every day**.
- **Regularity, variety:** your body requires you have regularly consumed foods from **different** groups.
- **Freshness:** **fresh** food is **best**.

# 03

## How much do we need to eat

# How much we have to eat

**The amount of food a person should eat daily** depends on several factors, including primarily their body weight and height, age, gender, level of physical activity, health status, genetic factors, and body composition (the ratio of fat mass to lean body mass in total body weight).

**Energy (caloric) requirements** are one of the most important factors influencing how much food we should eat daily. Calories are a measure of energy in the food we consume. Understanding calories helps us determine how much food we need. The optimal amount of food intake depends on how many calories we require.

| Energy (calorie) requirements depend on: | | |
|---|---|---|
| Weight, height | Age | Gender |
| Body composition | Physical activity | |
| Health | Hereditary factors | |

# How much we have to eat

1. Balance: A balanced diet that contains enough protein, carbohydrates, fats, vitamins and minerals should be followed.
2. Portions: the size of the portions depends on the individual's needs.
3. Hunger and satiety: hunger and satiety are natural feelings that signal the need to eat or, conversely, the request not to eat quantity and composition of food should be adjusted accordingly
4. Regularity and frequency of eating: it is better to eat regularly and reasonably often throughout the day. For some, it is better to eat smaller portions more frequently throughout the day - for example 5 times a day (breakfast - snack Lunch - snack - dinner). Others will prefer to eat larger portions less frequently during the day - for example 3 times a day (breakfast - lunch - dinner). Following a regular diet helps maintain stable energy levels and improves metabolism.
5. Variety: a variety of foods should be consumed to ensure a sufficient supply of nutrients.

# 04

## How nutrition relates to health

# Food fundamentally influences our lives.

"**Our diet significantly influences** whether we live our lives in good health and quality or whether we will face, often prematurely, health disorders and various diseases."

**Dietary Recommendations**. Almost all countries in the world have created and continue to develop their own dietary guidelines that promote health, based on food groups (Food-based dietary guidelines, FBDG), which are more understandable to people because we eat foods, not individual nutrients. Equally important is that diet is not only friendly to people but also to our environment. The guidelines are based on scientific and expert knowledge about diet, nutrition, and health. They are regularly reviewed and updated in accordance with the latest findings and scientific evidence – nutrition based on evidence (Evidence-based Nutrition).

significance of the treatment recommendations

# Diet affects health

**Inappropriate nutrition and poor eating habits** are linked to a wide range of chronic diseases. In all countries of the world, they are primarily responsible for deaths from chronic non-communicable diseases. When we talk about chronic or chronic non-communicable diseases, we primarily mean overweight and obesity, type 2 diabetes, cardiovascular diseases (especially heart attack and stroke), and oncological diseases (malignant tumors). This finding highlights the need for coordinated global efforts to achieve dietary patterns among people that support and positively impact their health while preventing the most common chronic diseases.

**Unhealthy lifestyle factors** – among them, improper diet is the most significant, as it contributes to the development of overweight and obesity, leading to the most serious chronic diseases, including type 2 diabetes, cardiovascular diseases, arterial hypertension (high blood pressure), and certain types of cancer.

# 05

## Balanced diet

# The diet should be varied, varied and balanced

**Diet and nutrition are beneficial for health** when they provide the body with the necessary amount of energy and all essential nutrients (**macronutrients:** proteins, fats, carbohydrates, dietary fiber) as well as **micronutrients**: vitamins, minerals, trace elements, and other important biologically active substances that it needs to function at its best.

**A varied and diverse diet is important for health.** No single food or food group can provide all the nutrients you need to stay healthy. Combining and consuming different foods from each food group can help you obtain a rich mix of essential nutrients that your body requires. **The more diverse the diet, the lower the risk of unbalanced nutrition.** However, it is important that the selection includes foods that support health and help prevent serious diseases (vegetables, fruits, whole grains, legumes, low-fat dairy products, fish, poultry, nuts, and plant seeds). Only then can we talk about **'healthy diversity'.**

## A plant-based diet is what drives me.

***Prefer predominantly plant-based foods.*** Plant-based foods, such as vegetables, fruits, whole grains, and legumes, provide many essential nutrients, fiber, and plant compounds (phytochemicals) while maintaining an appropriate calorie content. Vegetable oils and nuts are also valuable sources of nutrients, but they have a high fat content and, therefore, a high calorie content. Despite their high energy content, these foods support your health (e.g., olive oil, rapeseed oil, walnuts, flax seeds). They should be consumed often, but in smaller amounts due to their high calorie content.

# The importance of plant food for health

## Plant foods must be supplemented with animal foods

**It is advisable to complement plant-based foods with animal-based foods** to ensure an adequate intake of all essential nutrients. The best choices when consuming animal-based foods include fish, lean poultry meat, meat, low-fat milk and dairy products, and eggs. In limited amounts, lean red meat (beef, veal, pork) can also be consumed.

**A diet predominantly based on plant-based foods is also good for the planet Earth.** The production of food and beverages impacts the environment. Animal-based foods leave a larger carbon footprint, meaning they lead to higher emissions of gases released into the atmosphere, affecting the climate of our planet. A diet that is beneficial for health, according to the following guidelines, is also environmentally friendly and sustainable in the long term.

The importance of vegetation for the land plan

# 06-07

## Illustrative aids:

- plates and
- pyramids

# "Healthy Plates" visual aids

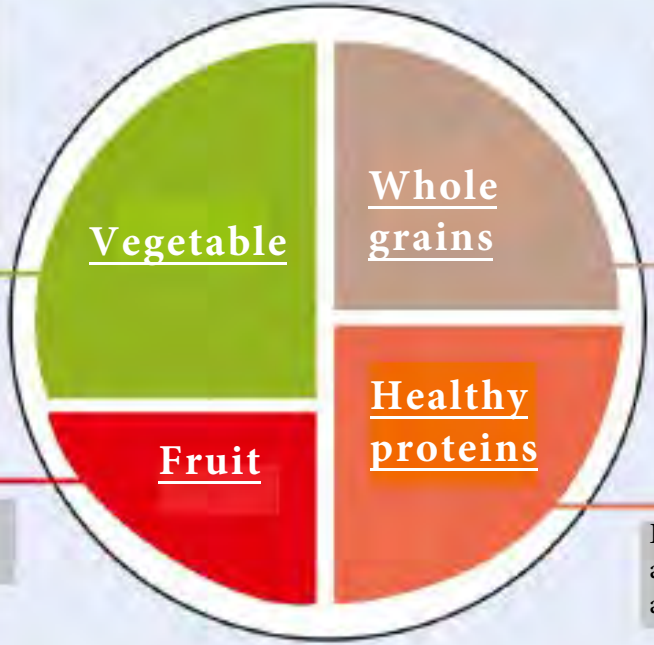
**Visual (illustrative) aids for dietary recommendations.** To facilitate the understanding of dietary recommendations—specifically, how much of each type of food we should eat, which foods should be consumed daily, which should be alternated with similar foods, and what the portion sizes of individual foods and beverages should be—visual (illustrative) aids are used. In practice, these aids typically take the form of **"healthy plates" or "food pyramids."**

**Healthy eating plates – "healthy plates."** They serve as a visual aid and one of the ways to illustrate and simplify the principles of healthy eating for the general public. In some countries, food pyramids were originally used, but over the years, following expert discussions, they have been replaced by plates (e.g., in the USA and Australia). Examples of currently used and recommended "healthy plates" include **the USA** (Healthy Eating Plate, 2011), **Australia** (Australian Guide to Healthy Eating, 2013), and **the United Kingdom** (Eatwell Guide, 2016).

# A plate of healthy eating

**Healthy Oils**

Use healthy oils (such as olive and canola oil) for cooking, salad preparation, and at the table. Limit butter. Avoid trans fats.




**Water**

Drink water, tea, or coffee (with little or no sugar). Limit milk and dairy (1–2 servings per day). Avoid sugary drinks.

The more varied and unprocessed the vegetables, the better. Potatoes and fries are not counted.

Eat whole grains (such as brown rice, whole wheat bread, whole wheat pasta). Limit refined grains (such as white rice and white bread).

Eat a lot and a variety of colors.

Eat fish, poultry, legumes, and nuts. Limit red meat and avoid processed meats.

Stay active!

Harvard University

Harvard School of Public Health
Nutrition Source

Harvard Medical School
Harvard Health Publications

Nutrition Australia


Image caption: Australian Guide to Healthy Eating – an example of a "Healthy Plate."
Source: The Australian Nutrition Foundation, 2013

Food Standards Agency

# A healthy, well-divided plate

Images courtesy of Freepik.com - by @jcomp

# "Food pyramid" visual aids

**Food pyramids** are simple visual aids and illustrative guides to healthy nutrition. The authors of these pyramids aim to provide both experts and the general public with a simple and easy-to-remember manual on which types of food to consume, how often, and in what proportion (ratio) daily, in order to maintain a healthy diet, support health, and prevent chronic diseases.

FOOD PYRAMIDS ARE THE PERFECT GUIDE

when planning a healthy and well-balanced diet

# Slovak Food Pyramid: A Guide to Healthy Eating

**The food pyramid helps you set up your overall eating habits.**
**A diverse selection of foods from the first four levels, consumed with the right frequency and in appropriate portion sizes, provides a healthy balance in what you eat and drink. It ensures an adequate intake of nutrients, vitamins, minerals, and other essential substances for the proper functioning of your body.**

**A healthy variety in eating is also beneficial for the environment.**

**Following the principles of healthy eating according to the food pyramid, along with physical activity, will make it easier to maintain an optimal weight and reduce the risk of diseases related to lifestyle, including cardiovascular diseases, certain cancers, and type 2 diabetes.**

## Who is the FOOD PYRAMID intended for?

Most people in Slovakia want to eat healthily. Dietary and nutrition recommendations for adults are **primarily intended for healthy adults** aged **19–65 years**. However, the principles of healthy eating and nutrition are also suitable **for other age groups,** such as children and adolescents (2–18 years), older adults (over 65 years), pregnant and breastfeeding women. However, in these groups, it is sometimes necessary to consider their specific energy and nutritional requirements.

## How to properly understand the FOOD PYRAMID?

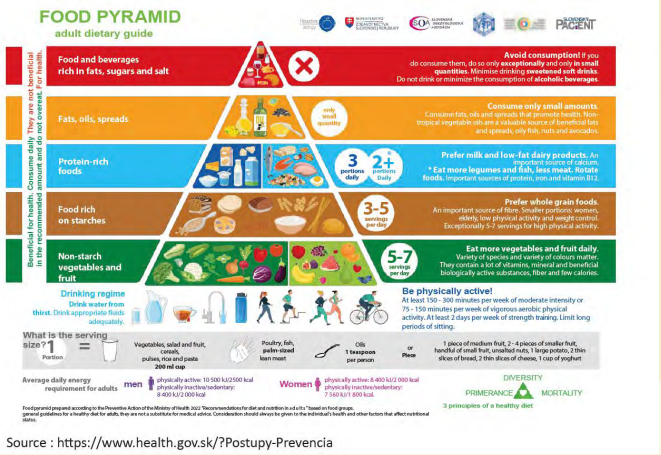
**The food pyramid represents different food groups.**
The size of each level indicates the amount that is suitable to consume from that food group. For example, the widest and lowest level consists of vegetables and fruits, and these food groups should be eaten in the largest portions daily.

**Each food and drink can be classified into one of the food groups**
based on the nutrients they contain. For example, legumes are a good source of plant-based proteins, so they are included in the protein-rich food group.

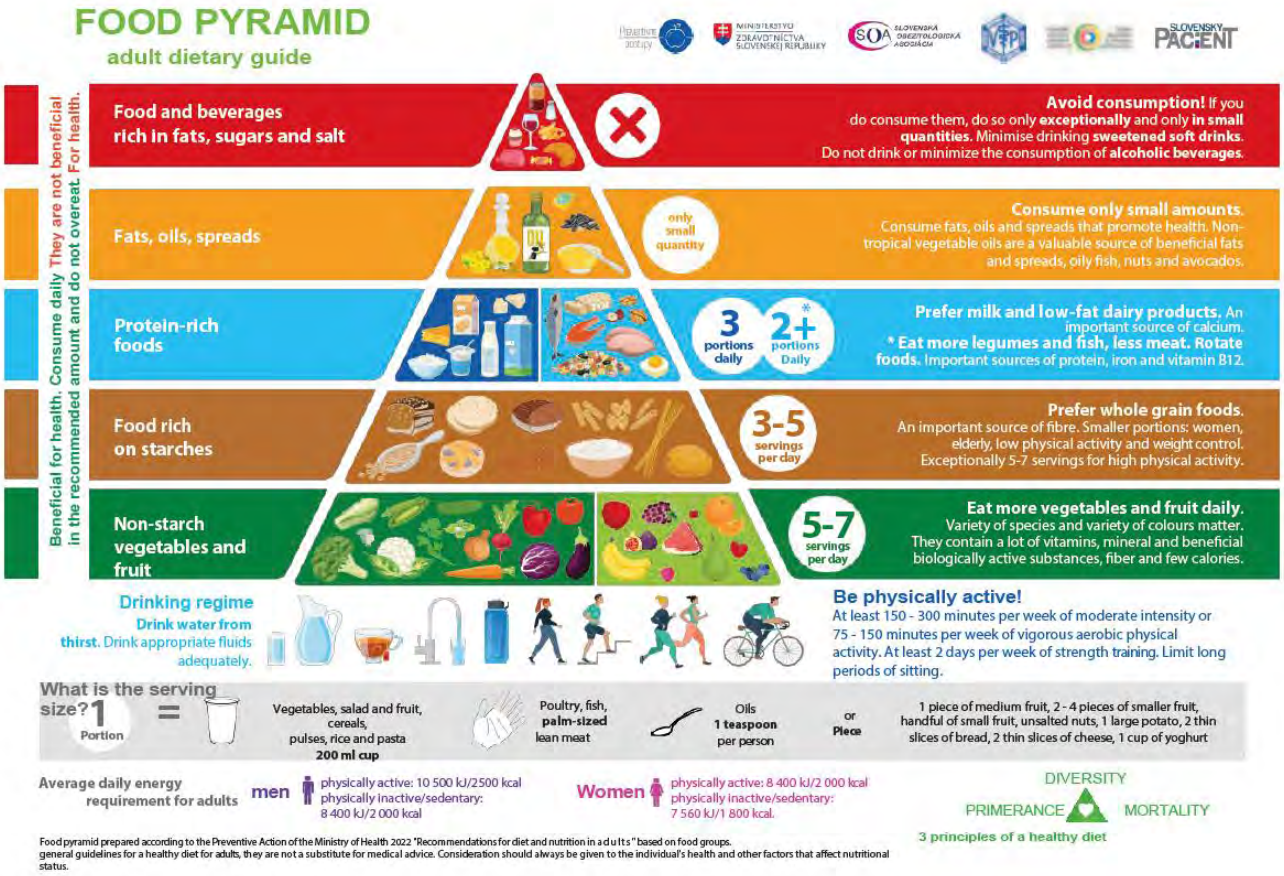
**Foods rich in proteins**
are grouped in the dairy and dairy products category, including low-fat or unsweetened dairy. The shape of the food pyramid serves as a visual representation of the recommended diet that supports good health.

**The top of the pyramid is separate from the rest of the pyramid**
because it contains foods and drinks that are not necessary or beneficial for health. These should be consumed less frequently or even avoided altogether. Regular consumption in large amounts harms health. If you do consume these foods, do so occasionally and in small quantities.

LET'S LEARN HOW TO MANAGE THE FOOD PYRAMID



Source : https://www.health.gov.sk/?Postupy-Prevencia




Source : https://www.health.gov.sk/?Postupy-Prevencia

Slovak food pyramid

Ministry of Health SR, 2023

roject: **Innovative STEPS** (Innovative SusTainability Education for Prosperous Schools)
Project Agreement Number: 2022-1-SK01-KA220-SCH-000085417

# Thank you!

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# Eating out
# Chapter 7

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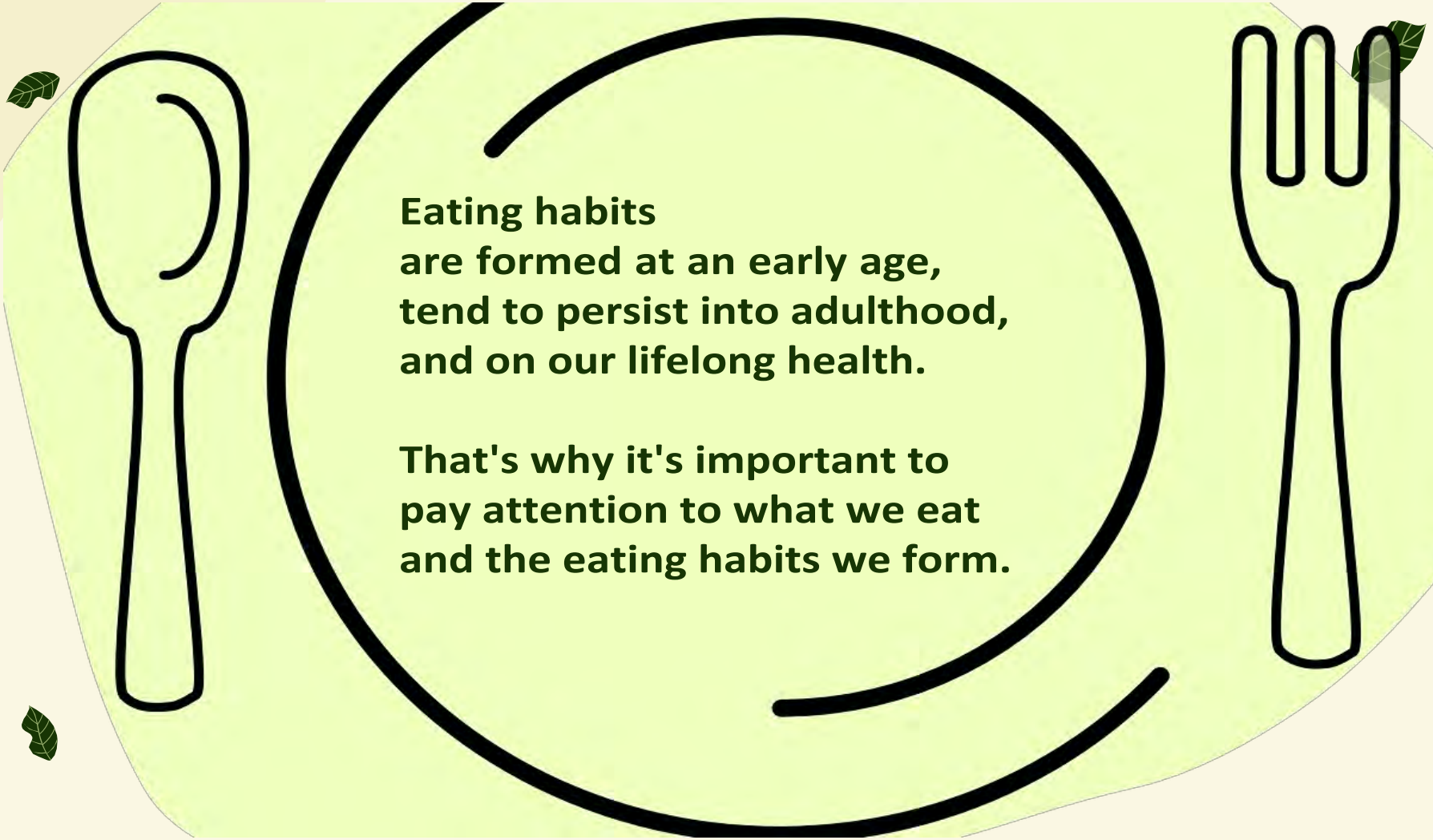
# Table of Contents

# Dining out

**Food eaten away from home**, e.g.

in a restaurant or fast food restaurant.

It is important in building community and social connections, allows the experience of diverse cuisine and encourages cultural exchange.


Eating habits
are formed at an early age,
tend to persist into adulthood,
and on our lifelong health.
That's why it's important to
pay attention to what we eat
and the eating habits we form.

# 7.1

# Catering at school

# How can we nutritionally support school performance ?

Varied diet

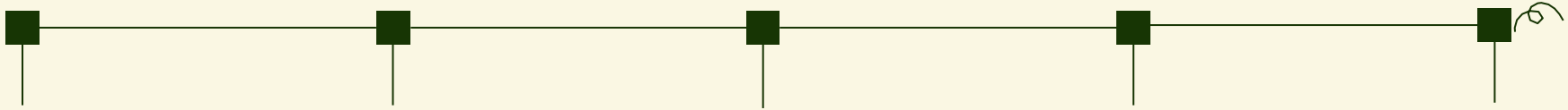
Sufficient energy

Nutrients

Fibre

Hydration

**APPLY**



Concentration

Memory

Mental balance

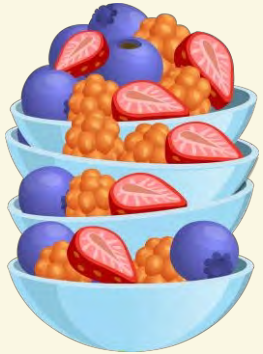
Immunity

Vitality

# Foods that support proper brain function

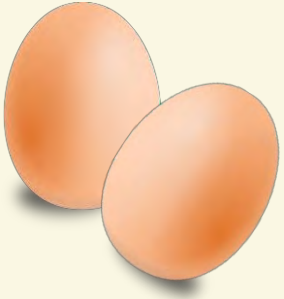
Fatty fish

Fruit



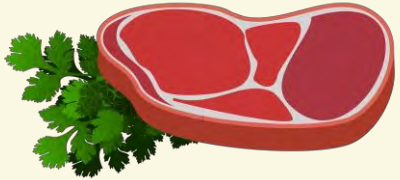
Vegetables (mainly leafy vegetables)

Eggs



Nuts and seeds

Chocolate



Poor red meat

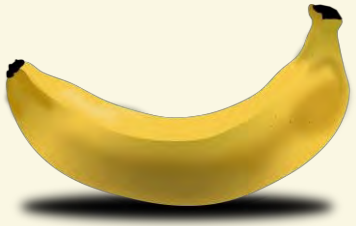
Legumes

# Healthy snack

Fruit and nuts
Vegetable snack with dip Smoothie
Wholemeal toast
Yoghurt with fruit and nuts Wholemeal biscuits with cheese
Cottage cheese with honey and fruit
Vegetable wrap

**Protein-rich foods**

**Fiber (vegetables, fruits, whole grains)**



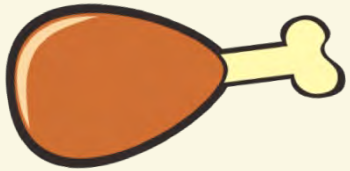
# Healthy lunch

Nourishing

Adequate portion

Wholemeal varieties

Vegetables



Lean meat

Fruit

# Healthy lunch

- Limit sweet and fried foods.
- Listen to your body.
- Involve your friends.
- Stand by your decisions.

# 7.2

# Catering in restaurants

# Tips on how to choose healthier meals

- ☐ Check the offer beforehand.
- ☐ Opt for cooked, roasted or stewed options.
- ☐ Choose lean meat.
- ☐ Load your vegetables.
- ☐ Limit added sugars and sauces.

- ☐ Choose whole grain side dishes.
- ☐ Drink water/unsweetened drinks.
- ☐ Watch out for appetizers.
- ☐ Skip the buffet mentality.
- ☐ Control your eating pace.

# 7.3

# Catering in fast food establishments

# Fast food - Fast-food

- High in calories, saturated fat, trans fat, added sugars and salt.
- Deficiency of essential nutrients (vitamins, minerals and fibre).
- Highly processed foods with additives.

**Frequent consumption increases the risk of chronic diseases such as obesity, cardiovascular disease, cancer, type 2 diabetes and other metabolic diseases.**

# Tips on how to choose healthier meals

- Check the nutritional information.
- Limit fried foods.
- Choose smaller portions.
- Choose lean meat.
- Load your vegetables.
- Watch out for hidden calories.
- Limit sugary drinks.
- Limit dressings and sauces.
- Prioritize salads.
- Avoid excessive portions.
- Pay attention to frequency consumption.

# 7.4
# Composition and information on food packaging

# Food packaging provides important information

- Name of the food
- The manufacturer or importer of the food
- Country of origin
- Quantity of food (weight or volume)
- Best before or use-by date
- Method of storage
- Method of use
- Food composition
- Nutrition (nutritional) data
- Warning on allergen content
- Warning for people who suffer from food intolerances
- Marks, symbols and claims
- Other

**In the European Union, strict and binding legislation**

# Food composition

- The individual ingredients are ranked in descending order of their content in the food from the one with the most to the one with the least, including additives ('ethers').
- A large number of ingredients is typical of highly processed foods.


**Ingredients**: whole oat flakes 58%, whey powder 11.5%, glucose syrup, corn starch, caramel chunks 4% (caramel 50% (sugar, glucose syrup, butter, cream, salt), oat fibre, gelling agent E401, stabiliser E341, salt, natural flavour, acid: citric acid, colour: caramel), fructose, cane sugar, sunflower oil, almonds 2,5 %, milk protein, flavour, salt.
*May contain traces of soya, peanuts and other nuts.*

Source : www.grizly.sk

# Nutritional data of the food

- Usually in the form of a table on the back of packaged foods.
- They express the energy and nutritional (nutrient) content per 100 g or 100 ml or 1 portion of food.
- Mandatory* and optional data.

**Mandatory data are highlighted in the table Color.*

| Nutrition facts per 100 g/100 ml or 1 serving | |
|---|---|
| Energy value | x kJ / x kcal |
| Fats | ... g |
| Of which saturates | ... g |
| Monounsaturated fatty acids | ... g |
| Polyunsaturated fatty acids | ... g |
| Carbohydrates | ... g |
| Of which sugars | ... g |
| Polyalcohols | ... g |
| Starches | ... g |
| Fibre | ... g |
| Protein | ... g |
| Salt | ... g |
| Vitamins and minerals | the units concerned |


Emco Oatmeal with chocolate 5x55 g

Ingredients: oat flakes 71 %, sugar, dark chocolate 6,7 % (sugar, cocoa mass, cocoa butter, dextrose, emulsifier: soya lecithin, vanilla extract, cocoa content min. 45%), whole milk powder, oat flour, cocoa powder 1.2%, salt, natural flavour. The product may contain peanuts and nuts.


Emco Oatmeal with raspberries 5x55 g

Ingredients: oat flakes 68 %, sugar, dried glucose syrup, whole milk powder, potato starch, freeze-dried raspberry pieces 0,7 % (100% raspberries), salt, flavouring.
The product may contain soya, peanuts, nuts and other nuts.

Source : www.grizly.sk

| Nutritional values per 100 g | |
|---|---|
| Energy value: | 1618 kJ / 387 kcal |
| Fats: | 8.2 g |
| of which saturated: | 4.8 g |
| Carbohydrates: | 62.2 g |
| of which sugars: | 19.4 g |
| Fiber: | 8.2 g |
| Proteins: | 11.5 g |
| Salt: | 0.79 g |

| Nutritional values per 100 g | |
|---|---|
| **Energy value:** | 1568 kJ / 371 kcal |
| **Fats:** | 5.6 g |
| of which saturated fatty acids: | 1.6 g |
| **Carbohydrates:** | 66 g |
| of which sugars: | 20 g |
| **Fiber:** | 7.1 g |
| **Proteins:** | 10 g |
| **Salt:** | 0.53 g |

# Substances causing allergy or intolerance

- Mandatory.
- Highlighted from other folders (font type or size, background).


**Ingredients**: vegetable fat - palm and coconut,
**Wheat flour**, Whole **milk** powder 17%, Sugar, Cocoa glaze 14% (sugar, palm and butter vegetable fat, cocoa 17%, non-fat cocoa**, whey powder**, emulsifier E442 and E476,
flavouring), **Soya flour**, Skimmed **milk** powder, Alcohol, Corn starch, **Sunflower** vegetable oil, Emulsifier (lecithins), Flavourings, Bulking agent (sodium carbonates), Egg **yolk** powder, Egg y**olk**
**May contain peanuts and tree nuts.**

- Cereals containing gluten
- Crustaceans
- Shellfish
- Eggs
- Fish
- Peanuts
- Zeler
- Soya
- Milk
- Shell fruit (nuts)
- Zeler
- Mustard
- Sulphur dioxide and sulphites
- Lupine beans

Information on substances causing allergies or intolerances must also be provided by caterers (school canteens, restaurants, etc.).

# Front marking of the nutritional composition of foodstuffs

- Foods of the same type (e.g. cereals) may have different nutritional composition and thus different nutritional quality.
- Consumption of foods with lower nutritional quality negatively affects Health.
- In order to better understand nutritional data and to make responsible choices for nutritionally superior foods, various front-of-food labels in the form of symbols are voluntarily used.

**Highest nutritional quality**


**Lowest nutritional quality**


A B C D E

Source : https://www.miestopredaja.sk/informacie-o-vyzivovej-kvalite-potravin-na-obale-su-pre-ludi-uzitocne/

# Other markings on the packaging




# Nutrition and health claims

- Voluntary.
- Approved within the EU.
- They inform about some beneficial property of the food.


**Source of fibre:** A food can only be called a source of fibre if it contains more than 3 g of fibre per 100 g or 1.5 g of fibre per 100 kcal.

**No sugar:** Can only be on the packaging if the product contains no more than 0.5 g of sugar per 100g or 100ml.

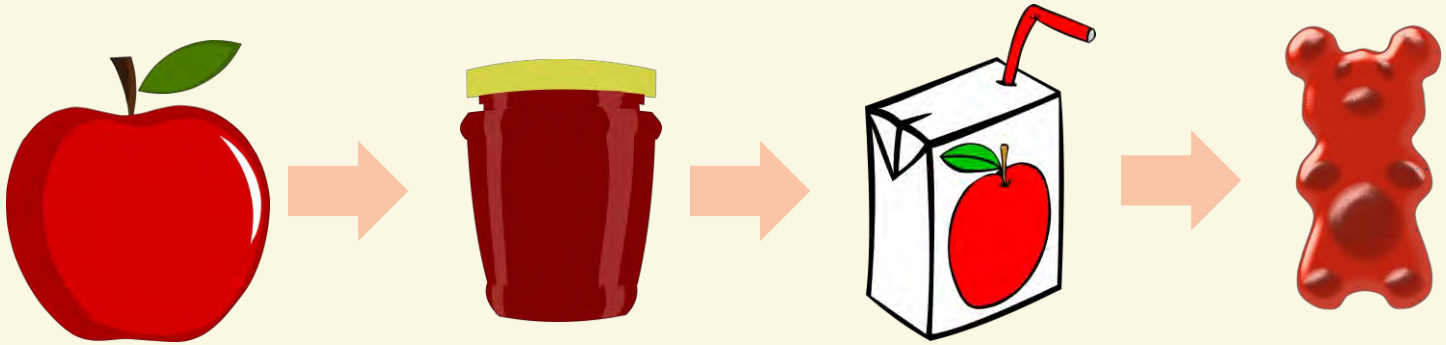
Don't forget ! A rich source of dietary fibre are plant foods origin - vegetables, fruits, whole grain cereal products, legumes.

Source : www.grizly.sk

# What to look out for when choosing food

- Read the composition.
- Keep an eye on the caloric value.
- Avoid shortcuts.
- Watch out for "hidden" sugars, fats and salt.
- Avoid stiff and saturated fat.
- Take into account the overall nutritional composition.
- Don't fall for marketing allegations.
- Take note of allergens.
- Prioritise as little as possible processed foods.

# PROCESSED FOOD



Raw

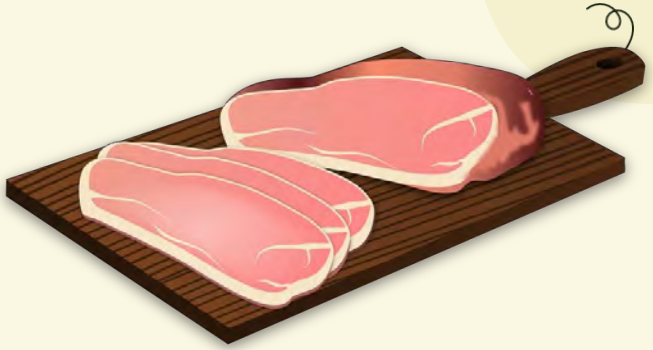
Minimum processed

Highly processed

Ultra processed

**Eat fresh, minimally processed foods.**

# Example - ham



- **Energy content**:

Lean poultry ham made from chicken or turkey breast
contains 1-2 grams of fat per 100 grams and approximately 400 kJ = 95 kcal.

- **The proportion of meat in the product**:

The proportion of meat in the products can vary between 30-90%.

**It is best to consume those products that contain the highest proportion of meat and the fewest additives.**

# Example - yoghurts

- **Amount of sugars**: ideally up to 5 g of sugar in 100 g of product.
- **Other added ingredients**: fruit yoghurt should contain at least 5% fruit, but usually contains only fruit syrup instead of fruit. Flavoured yoghurts also contain other ingredients such as flavourings, thickeners or sweeteners.


**3 - 5 g of sugar in 100 g**

**Around 9 g of sugar in 100 g**

**It is best to consume unflavoured yoghurt and sweeten it with fresh fruit, which also contains fibre.**


# 7.5

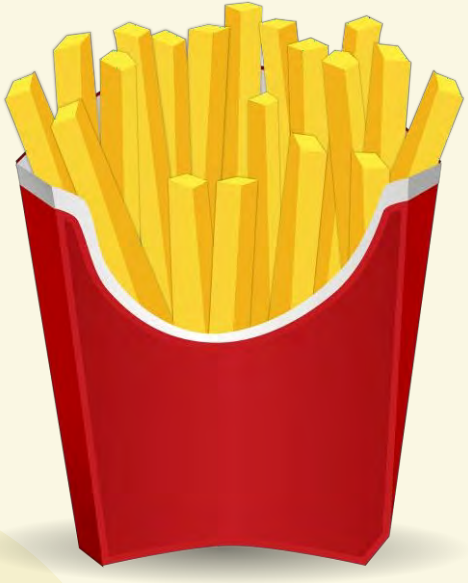
## Advertising and its impact on eating habits

# How does advertising work ?

- Sensual attraction.
- Emotional Attraction.
- Celebrity Engagement.
- Customer reviews.
- Scarcity and urgency.
- Health claims.
- Cultural component.
- Lifestyle connection
- Reward and pleasure.
- Attractive packaging.
- Interactive campaigns.


BIG
SALE

# Example - highly processed foods



+ 1 "free"

- 4 € with first purchase via App

"Free Fries Friday"

# How to resist manipulative advertising ?

- Recognize advertising tactics and the purpose of the advertisement.
- Don't be afraid to ask questions and get product information.
- Understand the difference between our desires and needs.
- Creating awareness about healthy options.
- Establish your personal health Objectives.
- Train your appetites.
- Get involved in the choice of meals.
- Practice mindful eating.
- Apply positive pressure peers.

INNOVATIVE STEPS

# Thank you!

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SOA SLOVAK OBESITY ASSOCIATION

FACULTY OF EDUCATION UNIVERSITY OF WEST BOHEMIA

EXPOL PEDAGOGIKA

68.СУ

РААБЕ Заедно за качество в образованието!

INNOVATIVE STEPS

Funded by the European Union

# Risks of inappropriate diet Chapter 8

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РААБЕ

# Table of Contents

# 8.1

# Dietary patterns and models

# Basic concepts

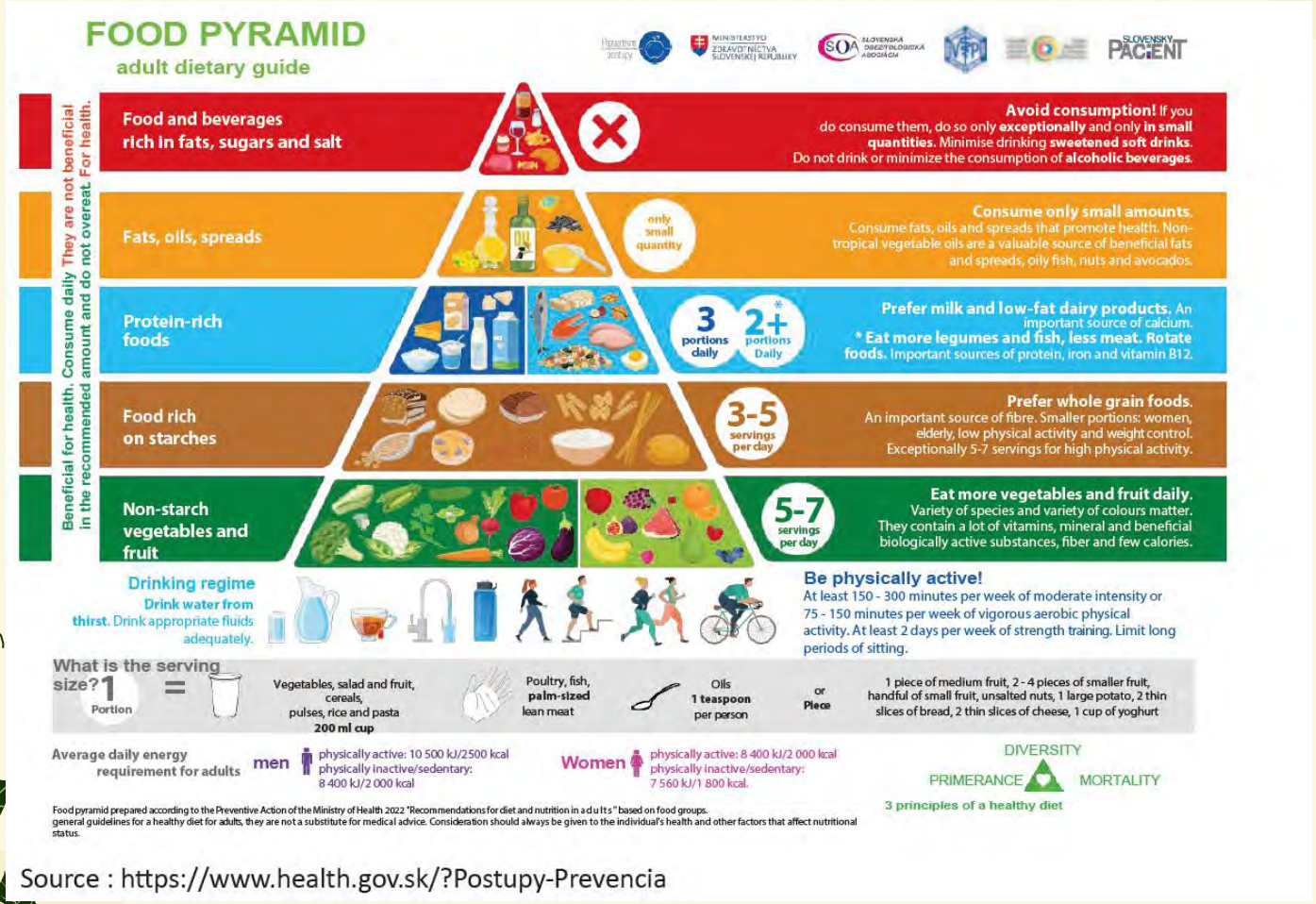
- Food Pyramid and Food plate
- Dietary *patterns*
- *Food* guide
- Dietary guidelines on food groups/ *Food-based dietary guidelines (FBDGs)*
- *Nutrient-dense foods* and *beverages*
- Healthy diet (healthy eating)/ *Healthy diet*

# Dietary pattern (pattern, method, style)

Food and drink combinations that we consume regularly and over a long period of time.

The most suitable way of eating a varied and balanced diet for almost all people is a dietary style with a predominantly plant-based diet supplemented with appropriate foods of animal origin. At the same time, it is reasonably environmentally friendly.

# Slovak food pyramid




Source : https://www.health.gov.sk/?Postupy-Prevencia

Ministry of Health SR, 2023

# Mediterranean way of eating

## Mediterranean diet

- ❑ High intake of vegetables, fruits, legumes, nuts, seeds, cereals and olive oil.
- ❑ Low to moderate intake of dairy products, fish and poultry.
- ❑ Rare consumption of red and processed meat.
- ❑ Rare and moderate alcohol intake in adults only.

**The most scientifically researched way of eating with confirmed effects on reducing the risk of chronic diseases and longevity.**

# "Western" way of eating

- ❑ Consumption of highly processed foods.
- ❑ Excessive calorie intake.
- ❑ High intake of saturated fats, trans fats, sugars and salt.
- ❑ Low consumption of vegetables, fruits, legumes and fish.

**Together with low physical activity and a sedentary lifestyle, it causes weight gain and the development of several chronic diseases.**

# Vegetarianism

- A plant-based diet with no meat, poultry, and sometimes fish and seafood.
- If it is varied and consistent, there is little risk of deficiencies of certain vitamins and minerals.

**In the case of children and adolescents, special care should be taken to ensure the proper nutritional value of a vegetarian diet.**

# Alternative styles of eating

- **Veganism** - without eating any foods of animal origin (meat, fish, eggs, milk, honey).
- **Pescatarianism** - no consumption of mammal meat (red meat).
- **Paleodiet** - eating natural foods that can be obtained by hunting and gathering.
- **Ketodiet** -reduced consumption of carbohydrate-containing foods.

- ❑ Harder to practice.
- ❑ Higher risks of nutrient deficiencies, especially of certain vitamins and minerals.
- ❑ Often they also contain highly processed foods.

# A varied diet with an adequate intake of energy and all nutrients is best for a healthy person.

**Some diseases or medical conditions** (e.g. diabetes, coeliac disease) require certain **dietary measures**, but these are part of the treatment and are usually led by a doctor, nurse or nutritionist.

Various other diets and restrictions on eating food or some of its ingredients without a medical reason are generally inappropriate especially in children and adolescents, pregnant and lactating women and the elderly.

# 8.2

# Catering Behaviour and catering habits

# Eating behaviour and habits

**They are influenced by a variety of factors and can have positive also negative health consequences**

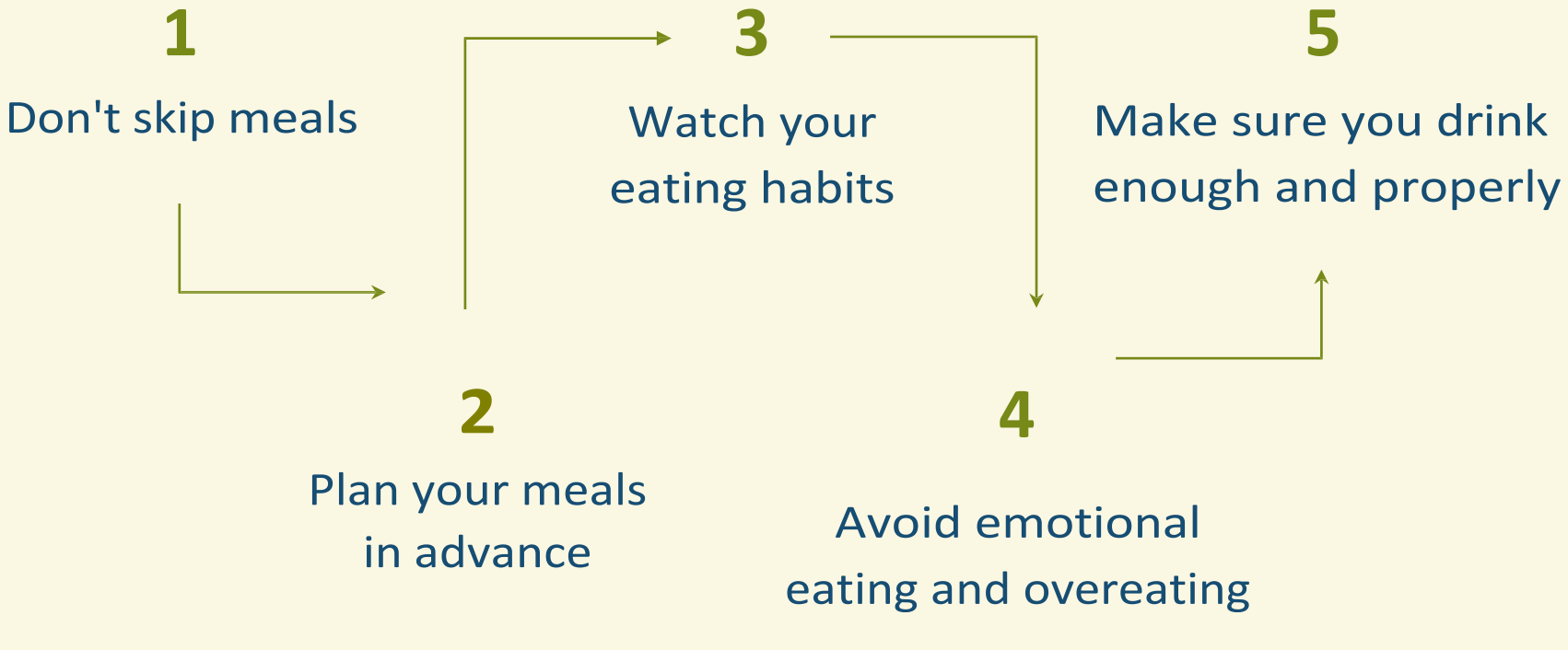
Culture, society

Family, singles

Economic proportions

Mental state

# Tips on good eating habits and eating healthy:



# Tips on good eating habits and eating healthy:

**6**
Limit treats

**7**
Eat mindfully

**8**
Eat in a particular environment, and check portion size

**9**
Eat a varied diet

**10**
Be self-indulgent and celebrate your successes

**11**
Keep a helper to maintain motivation and responsibility

# 8.3

## Inappropriate lifestyle - impact on health and fitness

# The most significant components of an incorrect lifestyle

**1**

Poor diet and unhealthy nutrition

**2**

Excessive alcohol consumption

**3**

Lack of physical activity and sedentary lifestyle

**4**

Smoking and other addictive substances

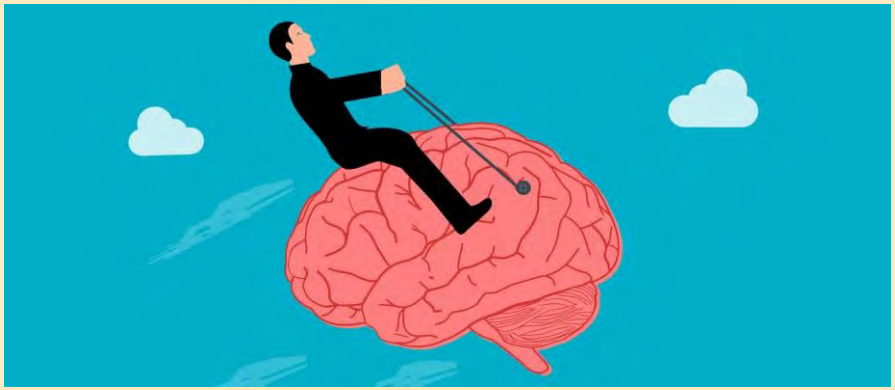
# Risks of an incorrect lifestyle

- **The emergence of chronic diseases**:
  obesity, diabetes (type 2), fat metabolism disorders, high blood pressure, heart disease, vascular disease and several types of cancer.

- **Shortened so-called "healthy years of life".**

- **Premature mortality from chronic diseases.**

**All forms of inappropriate lifestyles are influenceable and with motivation and determination can change them.**



**Lifestyle is primarily in each person's own hands.**

# 8.4

# Intake disorders food and starvation

# 8.5

# Overeating and obesity

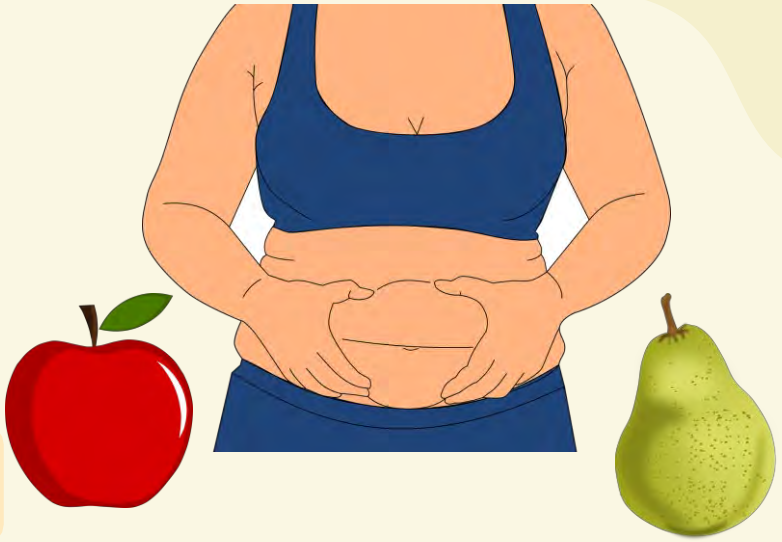
# The most common eating disorders

- Mental anorexia
- Bulimia
- Seizure overeating
- Regurgitation and rumination

**When any form of eating disorder is suspected it is important to seek professional medical help in a timely manner.**

# Body Mass Index (BMI)- Body Mass Index

| | |
|---|---|
| Less than 18,5 | **MALNUTRITION** |
| 18,5 - 24,9 | **OPTIMUM WEIGHT** |
| 25 - 29,9 | **OVERWEIGHT** |
| 30 and more | **OBESITY** |



**A good indicator of abdominal obesity:**

1. **Waist circumference =** women under 80 cm and men under 94 cm
2. **Ratio of waist circumference (cm) to body height (cm) =** index below 0.5
3. 0.5 - 0.6 = increased risk, 0.6 or more = high risk of metabolic diseases

# Obesity is a chronic metabolic disease

- It affects the function of every single organ in the body.
- Risk of about 236 diseases and health disorders.
- Risk of at least 13 malignant tumours.

## Treatment of obesity

- Complex (lifestyle, medication, surgically).
- Realistic achievable goals.
- Medical approach, under the guidance of a doctor and with the participation of other specialists.
- Sustainable means.

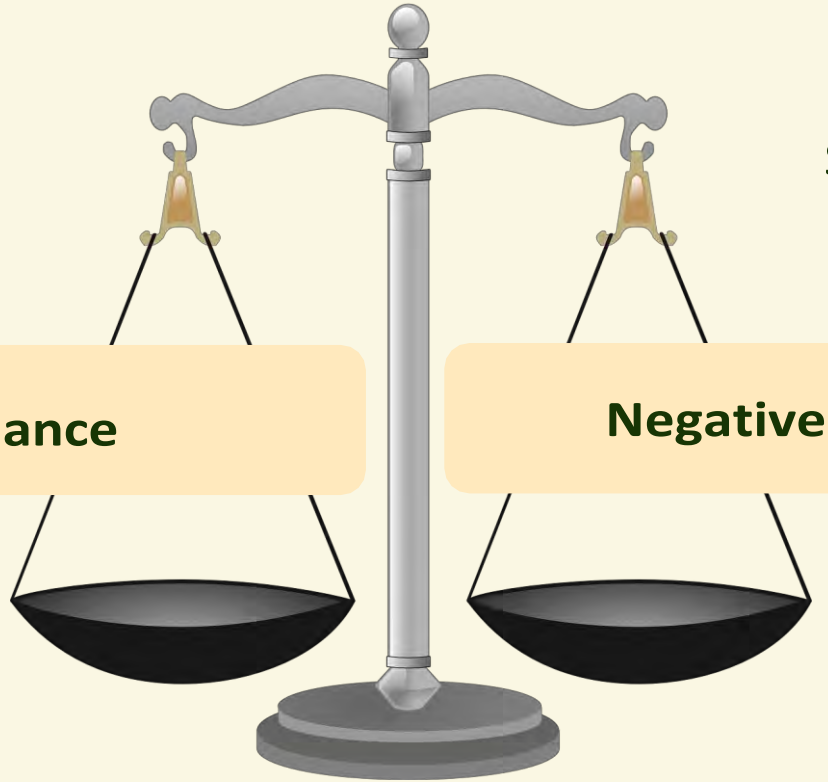
# ENERGY INPUT AND OUTPUT

OPTIMAL

MASS

SUPERNATURAL

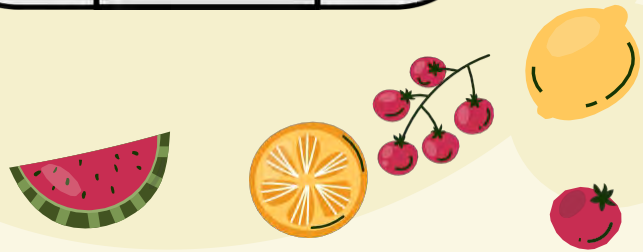
MASS



**Maintaining balance**

**Negative energy balance**

**Beware of short-term reduction diets**

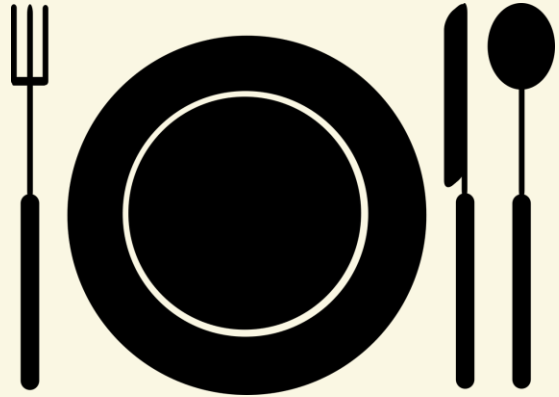


# 8.6

# Overeating and triggers for binge eating

# Overeating

**Eating even after feeling full. If overeating becomes a habit, it can lead to weight gain, weight gain and various eating disorders.**

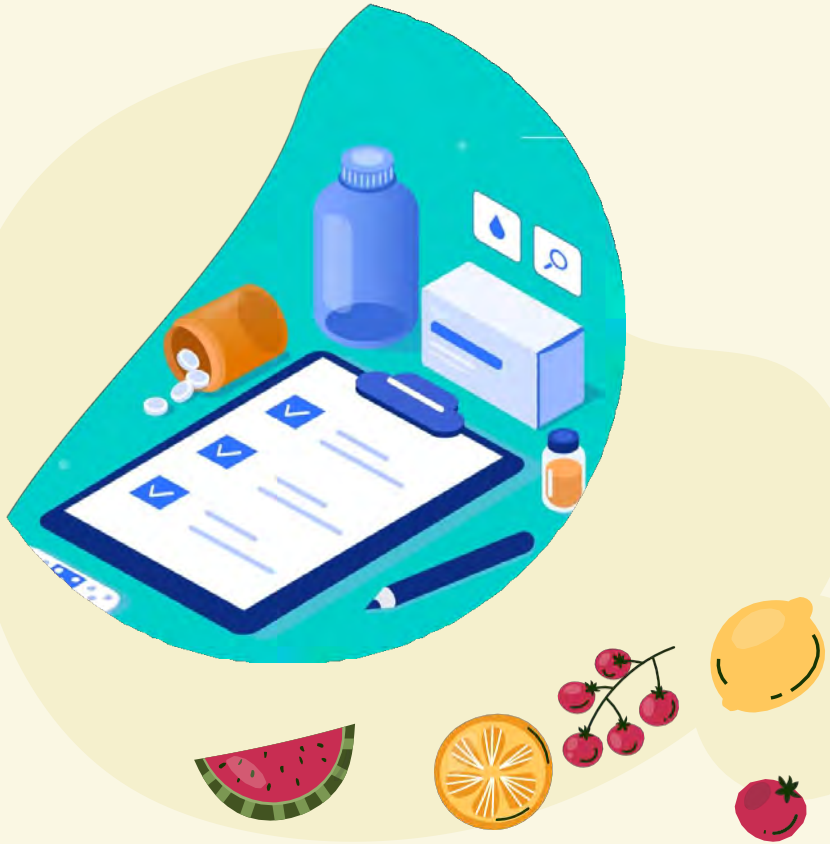


# What are the main causes of overeating ?

- Social situations.
- Time of day.
- Large portions
- Emotional Eating.
- Incorrect eating habits.
- Highly processed Food.
- Some medications.
- Health.

# How to prevent overeating ?

- Regular exercise and sleep.
- Regular food intake.
- Limit TV, internet and social networking.
- Limit alcohol consumption.
- Avoid salty foods.
- Adequate food portions.
- Fill your plate with vegetables. Control and manage stress. Eating slowly and mindfully.



# 8.7

# Help with obesity and eating disorders

**For obesity, malnutrition and eating disorders, you need to seek help from your GP early.**

**The doctor can best assess the patient's health and shift it in correct direction .**

**In Slovakia**

LINKA OBEZITY

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**https://www.linkaobezity.sk/**

# 8.8

# Food allergies and intolerances

# Food allergy

**Overreaction of the immune system to specific protein.**

**It is necessary not to consume even a small amount of food that contains the allergen in question.**

## The most common food allergens

- Milk
- Eggs
- Nuts
- Fish
- Seafood
- Wheat
- Soya

## Speeches

- ❑ Skin urticaria
- ❑ Itching
- ❑ Swelling
- ❑ Eczema
- ❑ Asthma
- ❑ Anaphylaxis

# Food intolerance

**Adverse reaction to certain foods. It is not an immune Reaction.**

**Small amounts of food are usually well tolerated.**

**Symptoms:**

- ❑ More annoying than serious.
- ❑ Shivering, sweating, burning sensation on the skin, poundi
  heart, headache, migraine, difficulty breathing.

# Foods that cause food intolerances:

- Dairy products Some
- fruits Some vegetables
- Chocolate
- Eggs
- Flavour enhancers Food
- additives Histamine and
- other amines

- ❑ **Lactose intolerance** (milk sugar)
- ❑ **Fructose intolerance** (fruit sugar)
- ❑ **Gluten intolerance** (a complex of proteins in wheat, barley and rye grains)
- ❑ **Histamine intolerance** (histamine is a substance in proteins)

# Thank you!

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INNOVATIVE STEPS

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# Food safety and hygiene
# Chapter 9


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# Safe food

Safe food is food which, when prepared as intended, is fit for consumption in terms of microbiological, chemical and physical safety, has not lost its nutritional value and does not endanger human health.

# Food safety

**Food safety is essential**

**a prerequisite for human health.**

It is especially important for:

- pregnant women,
- small children,
- old people,
- sick people,
- people with alternative eating styles
  (e.g. eating uncooked or unpasteurised foods).

Food safety involves various measures and rules to prevent **food contamination** and to reduce the risk of *foodborne* **diseases**.

Food safety is studied by scientific Department of **Food Hygiene**.

Food safety must be ensured throughout the **food chain**. It applies to everyone who handles food in any way - from producers to consumers.

**Food safety is one of the European Union's priorities** and includes food hygiene, animal and plant health, contaminants and residues in food.


**The European Food Safety Authority (EFSA)** carries out independent risk assessments and provides scientific advice that underpins EU food safety standards, helping to protect consumers from risks in the food chain.

# 9.1

# Food contamination

**More than 200 diseases are caused by eating contaminated food.**

**Food contamination means the presence of undesirable and potentially harmful substances in food.**

The manifestations of eating contaminated food are varied:

Without symptoms

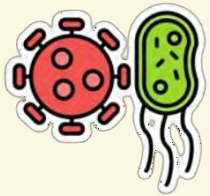
Fatal

# Contaminants in food

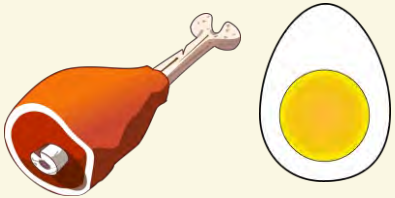
- **Biological** - bacteria, viruses, parasites, fungi, toxins microorganisms, prions.
- **Chemical** - chemical substances (mycotoxins, heavy metals, pesticides and others).
- **Physical** - bone debris, feathers, hair, plastic, glass, soil, etc.
- Other - radioactive substances, allergens and others.

**The most common type of food contamination is biological contamination.**

# Biological contaminants in food



Bacteria, viruses a parasites can alter the properties of food (colour, taste, smell).



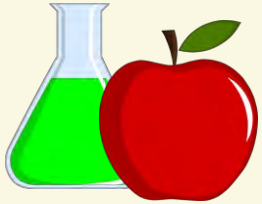
Contaminated: drinking water, raw meat, fish, milk and dairy products, eggs, plant sprouts and others.

They can cause various **infectious communicable diseases** (rapid progression, temperature, diarrhea, vomiting, abdominal pain, intestinal cramps). Dangerous in young children and the elderly (risk of dehydration and mineral loss).

Examples:

- Salmonellosis
- Viral hepatitis A (jaundice, "dirty hands disease").

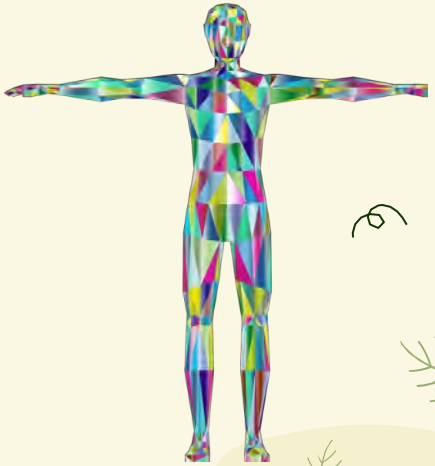
# Chemical contaminants in food



Naturally occurring **toxins** (mycotoxins) or **chemicals** in the environment (heavy metals such as lead, cadmium, arsenic, mercury, pesticides and others). They enter the environment as a result of human activity. They usually do not change the characteristics of the food (colour, taste, smell).

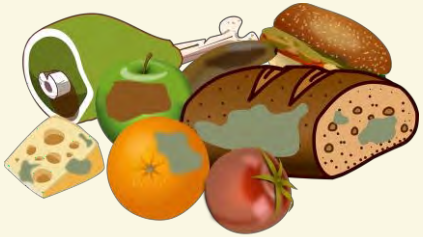
**Early to immediate manifestations**
- **poisoning** (e.g. botulism is poisoning caused by botulinum toxin. One of the most dangerous poisons of the bacterium, which can contaminate canned meat, fish, legumes, mushroom and fish products in foil, insufficiently washed vegetables and fruits).

**Late manifestations**
- at high levels or with prolonged exposure to small amounts of contaminants. Damage to various organs and systems and the development of cancer.



# Mycotoxins

Chemicals produced by microscopic fungi and moulds. **Aflatoxins** are the most well-known toxic mycotoxins that increase the risk of cancer.



Mycotoxins are most commonly found in foods: grains and grain products (bread and baked goods), cereals, nuts, spices, dried fruits, coffee, dairy and meat products, compotes.

Mould is visible but may not change the taste of the food. Most mycotoxins do not cause acute poisoning, but can cause a variety of allergic, immune and cancerous effects if they act over a long period of time.

**Never eat food affected by mould, e v e n after the mould has been removed, as dangerous toxins remain in the food.**

# 9.2 Purchase, storage, handling, preparation and consumption of food

# Food safety

Food safety affects everyone - **everyone** should **take basic precautions to reduce their risk of foodborne illness** for the sake of their health.

These measures relate to the purchase, storage, handling, preparation and consumption of food.

## When buying

- ✓ Buy fresh and non-perishable food (vegetables, fruit, meat). Fish from proven sources.
- ✓ Keep track of the expiration dates of the food.
- ✓ Use refrigerated containers when transporting perishable foods home.

## In storage

- ✓ Observe the storage conditions for individual foods (cool, room temperature, dry).
- ✓ Store cooked food at room temperature for up to 2 hours, then refrigerate at 5°C.
- ✓ Store raw and cooked food separately.
- ✓ Store food in the refrigerator in closed containers.

## When handling

- ✓ Wash your hands before preparing food (with warm water and soap).
- ✓ Wash and clean food (fruit, vegetables, meat).
- ✓ Keep clean all areas and items used in food handling.
- ✓ Use special tools (knives, containers, cutting boards) for raw and cooked food.

## When cooking

- ✓ Sufficiently cook meat, eggs, fish, seafood.
- ✓ Do not grill over an open fire ! This produces high risk substances for cancer. Such substances are also formed in rendered fats and oils, frying and smoking.
- ✓ Use these treatment methods only rarely. Prefer cooking or steaming.

## When consuming

- ✓ Wash your hands well before every meal!
- ✓ Drink and use safe water from safe and known Sources.
- ✓ Consume food in accordance with the use-by date or best before date.
- ✓ Eat the heated food immediately, do not reheat it.
- ✓ Do not refreeze thawed food. Process them immediately, do not leave them at room temperature for longer periods of time.
- ✓ When heating food in the microwave, observe the following the recommended heating time and temperature.
- ✓ Do not eat food affected by mould, even after it has been removed.
- ✓ Do not eat burnt and burnt food.
- ✓ Prioritise food in organic quality.

# 9.3

# Food labelling

- Important information on food packaging in terms of safety is:
- **Use-by date** (**best before** and **best** before **dates**) **usability).**
- **Storage method.**
- **Ingredients causing allergies or intolerances.**

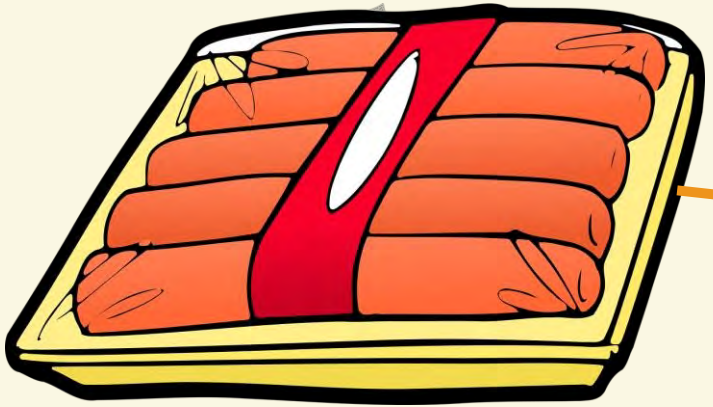
## Best before date

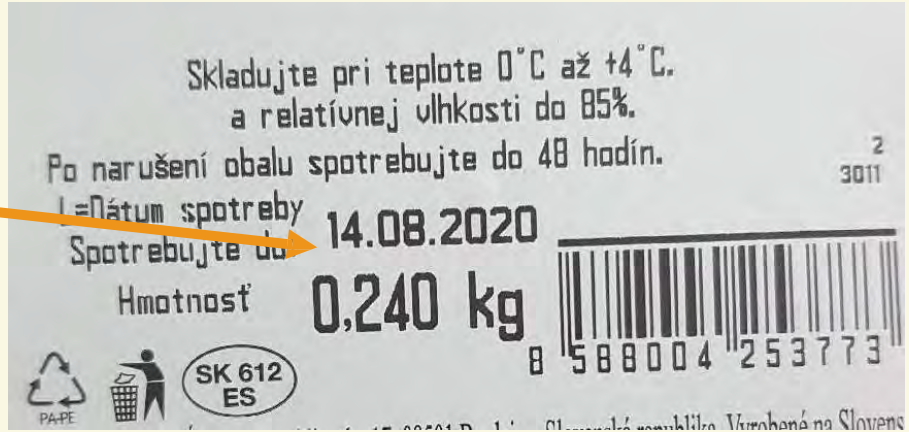
- ✓ The date until which a foodstuff retains its specific properties when stored properly. **The food may be consumed after that date, provided that it has been properly stored and its packaging is intact.**
- ✓ It is indicated on dried, frozen, canned and other non-perishable foods.

## Best before (expiry) date

- ✓ The date until which the food is safe from a microbial point of view when stored as recommended.
- ✓ **The food should not be consumed after the expiry date.**
- ✓ It appears on fresh foods and on perishable foods such as fresh meat and meat products, yoghurt, mayonnaise salads, desserts, etc.
- ✓ The expiry date shall be indicated by the words **Use by:** ....."

# Example - sausages





# 9.4

# Food additives

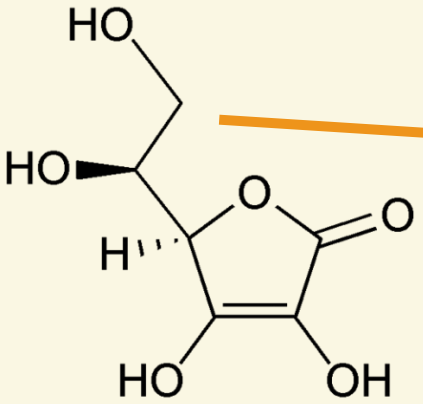
# Additives (food additives, additives)

- Additives are **any chemical substances of synthetic or natural origin that are added to food to modify its properties**, such as taste, flavour, colour, consistency or shelf-life. However, they may not alter the nutritional value and quality of the food.
- These include sweeteners, preservatives, antioxidants, colouring agents and others.
- Only authorised substances may be used and only in authorised quantities. They must be listed on the product label and **marked with the letter 'E' and a numerical code indicating that they have been approved in the European Union as safe and do not pose a health risk**.
- However, attention should be paid to pregnant and breastfeeding women, young children and people with allergies or increased sensitivity to certain additives.
- Many additives are found in highly processed foods.

**Unlike contaminants, additives are nothing to worry about. However, the basis of the diet should be unprocessed foods to which 'E' is not added. By eating processed foods, we also increase our intake of additives.**

# Example

## Vitamin C (ascorbic acid)




E300 - Vitamin C (ascorbic acid)

## Pineapple juice

Drinking water, Sugar (D) and/or glucose-fructose syrup (G), Pineapple juice from concentrate (4%), **Acidity regulator: citric acid, Stabilizers: carboxymethylcellulose, gum arabic, pine resin glycerol ester and pectins, Vitamin C, Colour: Beta-carotene, Sweeteners: sucralose and acesulfame K, Flavour, D, G** - depending on the raw material used: see imprint at the top of the package, Fruit juice percentage: 4%

# Food fortification

- Food fortification is the **addition of nutritionally beneficial substances** such as vitamins, minerals, fibre and other nutrients to foods to reduce their deficiency or to replace substances whose content has decreased during food processing.
- Examples: enriching salt with iodine and thus preventing the development of thyroid disease. Flour, cereals, juice, milk and dairy products are fortified.

**Food fortification is beneficial, but it is more important to follow the general advice on healthy eating.**

# 9.5

# Safe eating advice

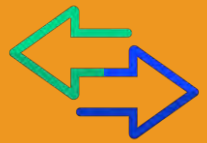
# For safe eating, observe:

- Good hygiene habits. Wash your hands thoroughly before and during meal preparation.
- Buy safe and wholesome food.
- Store food properly.
- Ensure safe and hygienic food preparation.
- Eat fresh and safe food.
- Use safe water.

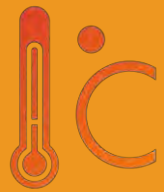
# In the kitchen, observe:

**WASH**

**SHARE**



**COOK**



**COOL**

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# Sustainable eating

## Food that is healthy for people and for the Earth

## Chapter 10


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**10.1**

Meaning: sustainable eating and sustainable food.

**10.2**

Climate change, environment and food security

**10.3** Food production and consumption

and their impact on climatic conditions
- "from farm to fork and waste"

# 10.1

# Sustainable catering and food

# The importance of sustainable eating

**Food** is not only a means of satisfying hunger and gaining energy, but it also has a significant **impact on our health and the planet we live on.**

It is important to recognise the link between ourselves and the environment, and to remember **that healthy dietary choices contribute towards a sustainable lifestyle for us for future generations.**

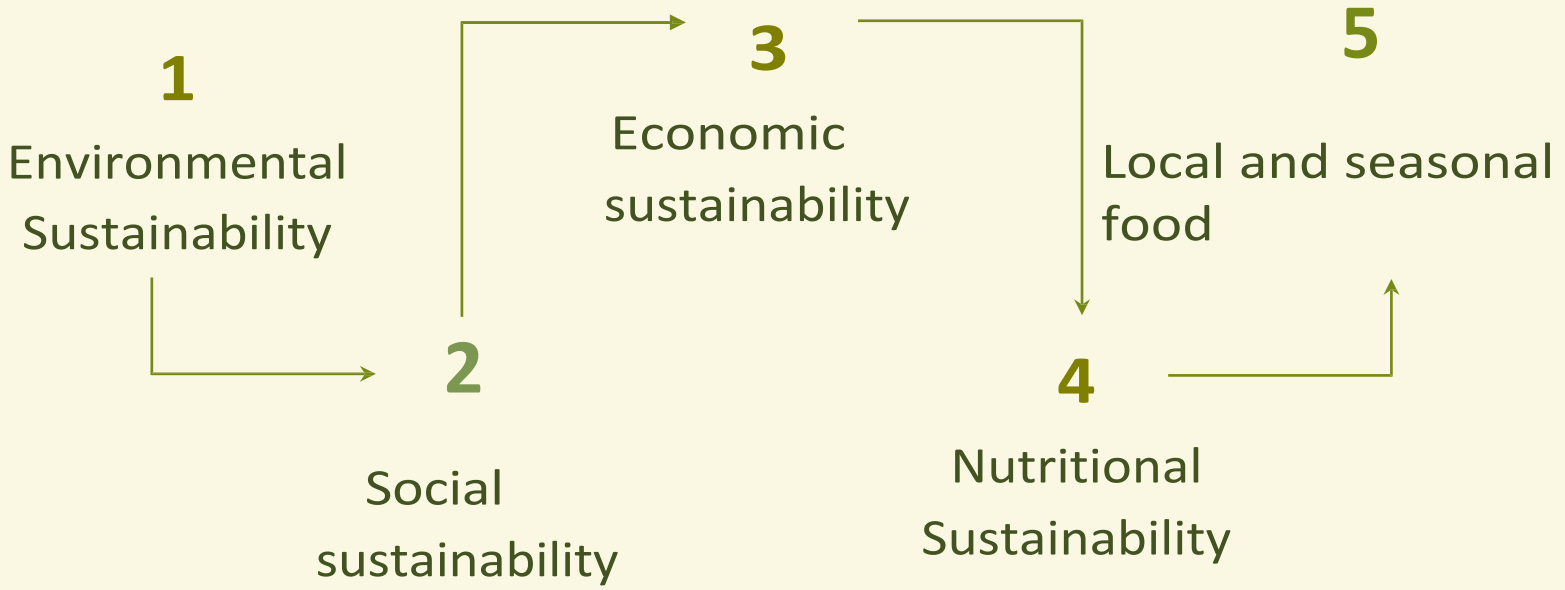
# What sustainable eating means

- Enough food for all.
- Securing future generations.
- Positive impact on the environment, society, economy and individual health.
- Minimise the negative effects of production, distribution and consumption on the planet.
- Production that does not threaten the basic resources for life.
- Sustainable food consumption.

# Sustainable food

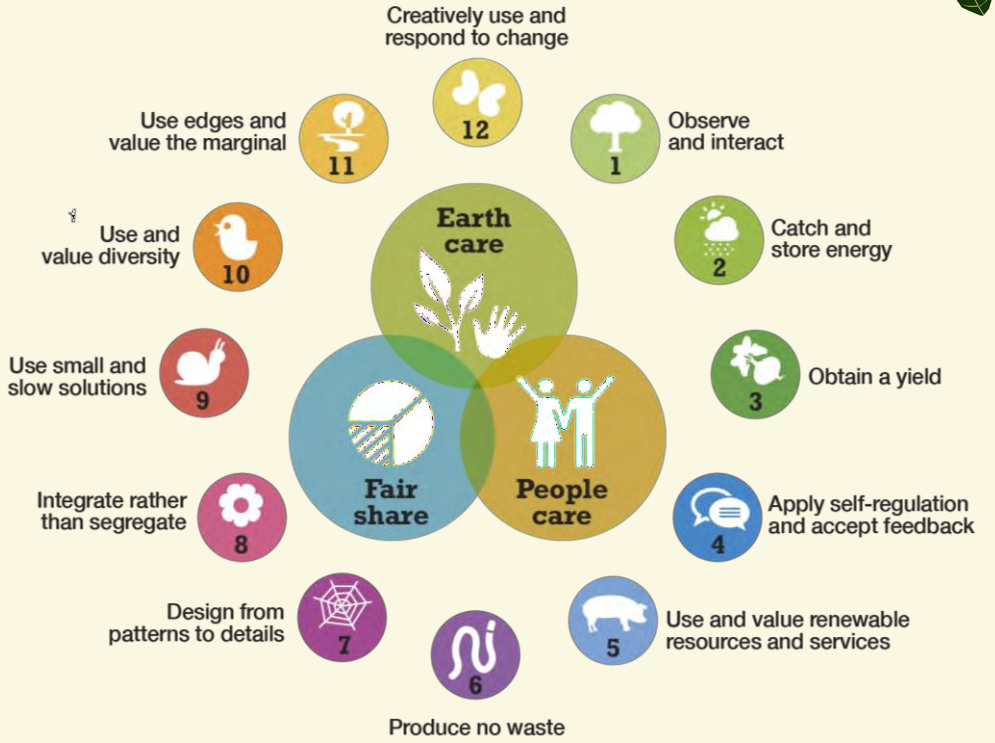
contribute to sustainable agriculture
and the food system.

# Sustainable eating and sustainable food



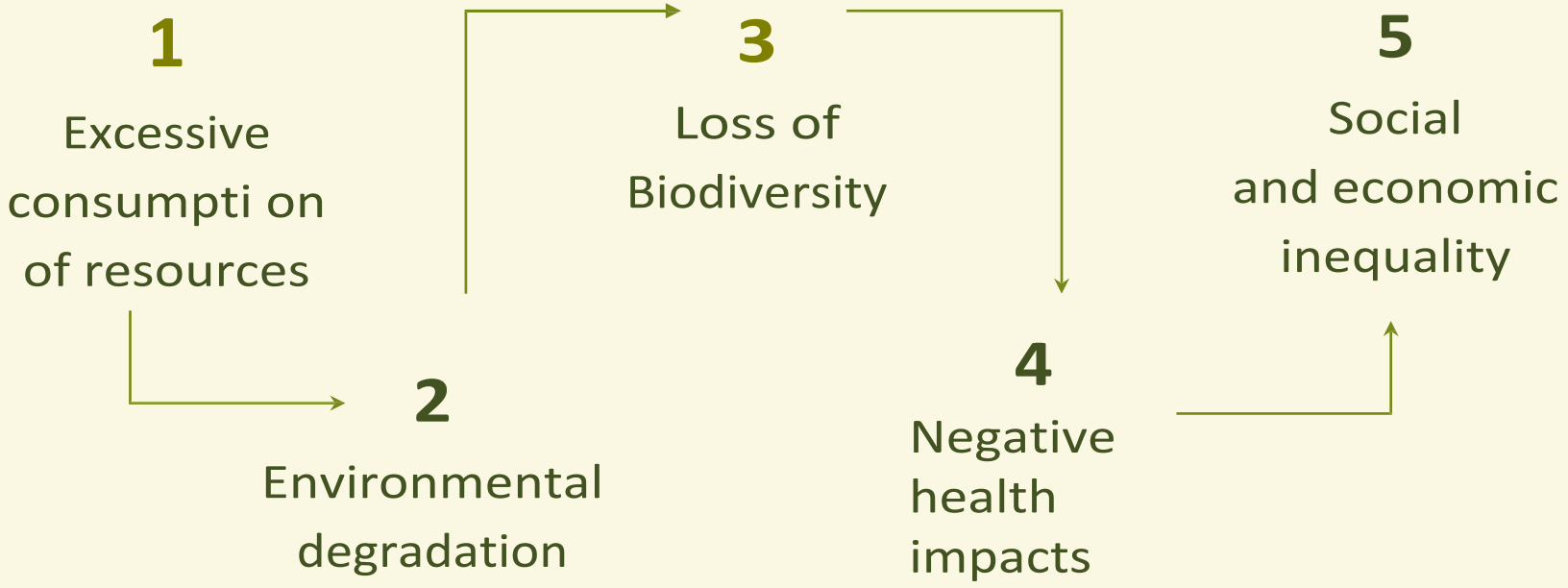
# "Permaculture - sustainable agriculture"

A system that seeks to create sustainable and regenerative habitats by linking human activity with the natural environment. It mimics the patterns and relationships in nature and thus achieves long-term ecological balance and sustainability.




Source : https://theseedlingatsagada.wordpress.com/permaculture/

# Unsustainable eating and food consumption



# 10.2

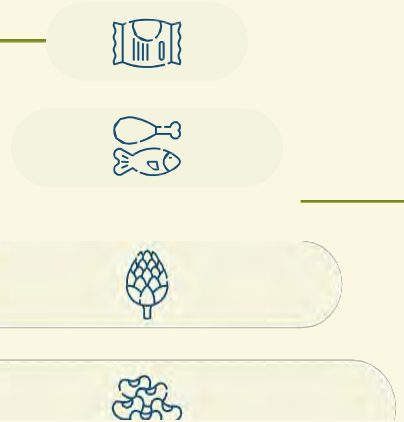
# Climate, environment and food security

# Climate change

**Significantly affected by human activity.**

## Temperature

Rising global temperatures, wildfires, drought and water scarcity.



## Wind

Extreme weather phenomena - storms, tornadoes.

## Water

Rising sea levels, flooding.

# Climate change affects:

Biodiversity

Water resources

Sustainability

Agriculture

Human health

Environment

# Food safety
## food security

It means that all people have stable access to sufficient, safe and nutritious food that meets their dietary needs and enables a healthy and active life.

### Food self-sufficiency
*food self-sufficiency*

The ability of the country to provide food of domestic origin. By favouring home-grown food, we increase food self-sufficiency, improve the economic level of the country and reduce the environmental burden.

### Food safety
*food safety*

Measures along the food chain to prevent foodborne diseases.

# The 3 pillars of food security

Food security is threatened by poverty, climate change, war and unrest, infrastructure problems (distribution, storage).

**Availability of food**

The level and stability of food production, storage, distribution and processing.

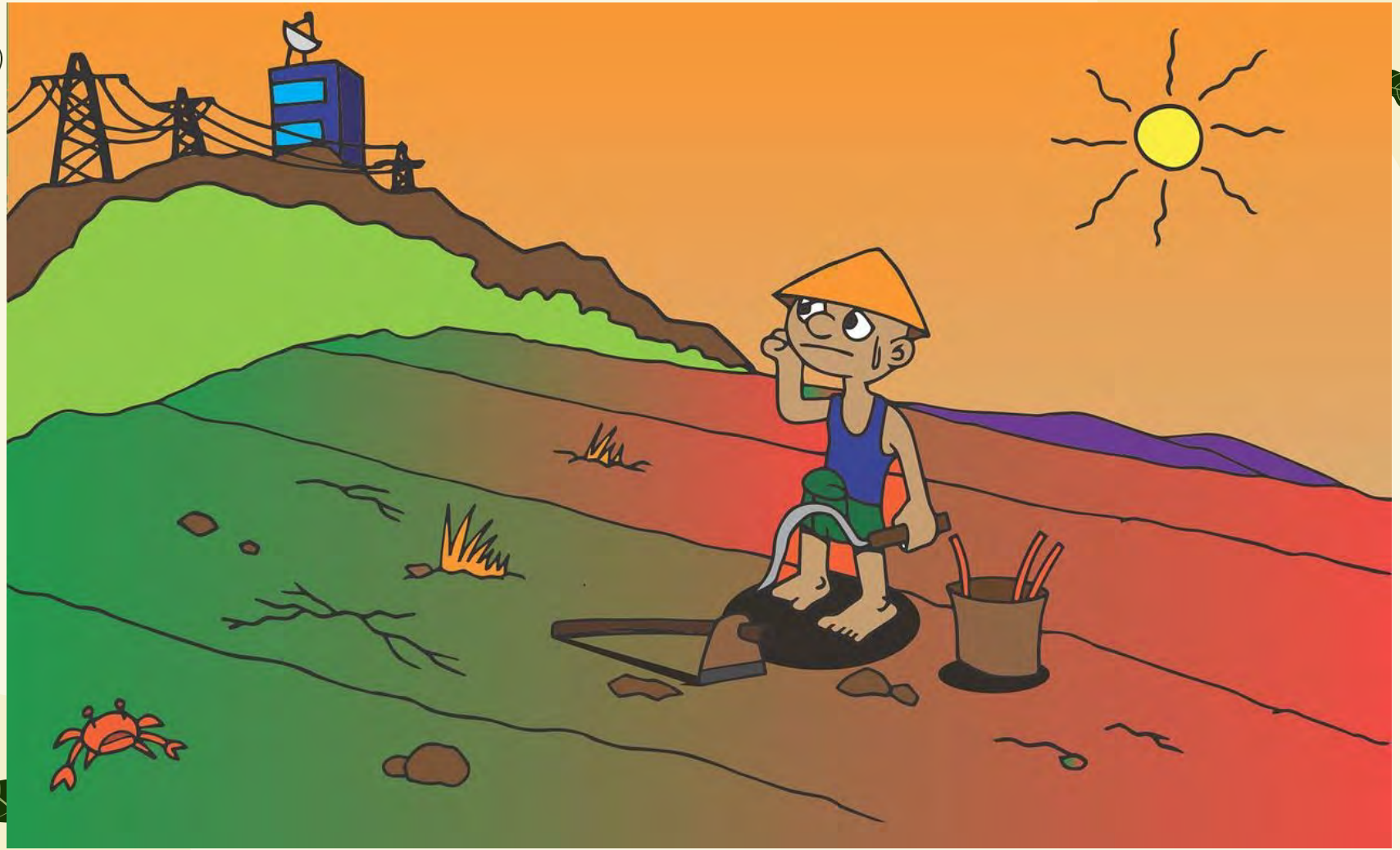
**Access to food**

Financial income, proper functioning of the food market.

**Use of food**

Nutritional quality and food safety.

# The link between us and the environment



# 10.3

"From farm to fork and waste"

# Agriculture and food consumption

Food production

Processing and transport food

Choosing and buying food

Waste and recycling

# Food production

**Agriculture is responsible for 20% of total greenhouse gas emissions, more than the gases produced by all means of transport combined.**

**Agriculture is the largest consumer of water and consumes 70 to 80% of the total water.**

# Impact of agriculture

Monoculture Agriculture

Cage breeding and overbreeding

Overfishing

# Environmental indicators of agriculture

- **Carbon footprint**

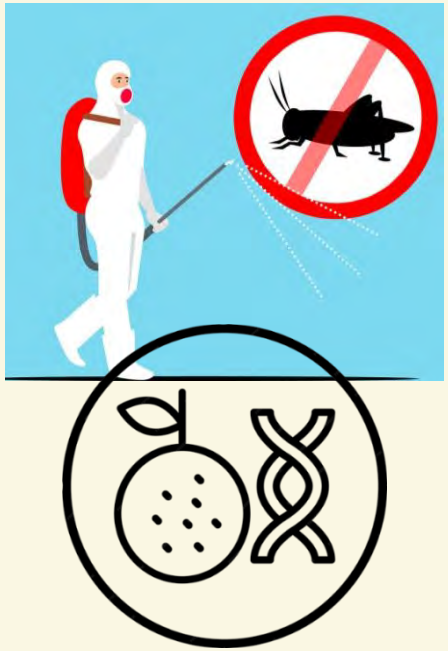
Total greenhouse gases (including carbon dioxide and methane) that are produced by human activities.

- **Water footprint**

The volume of freshwater (in litres or cubic metres) used throughout the production chain of a consumer good or service.

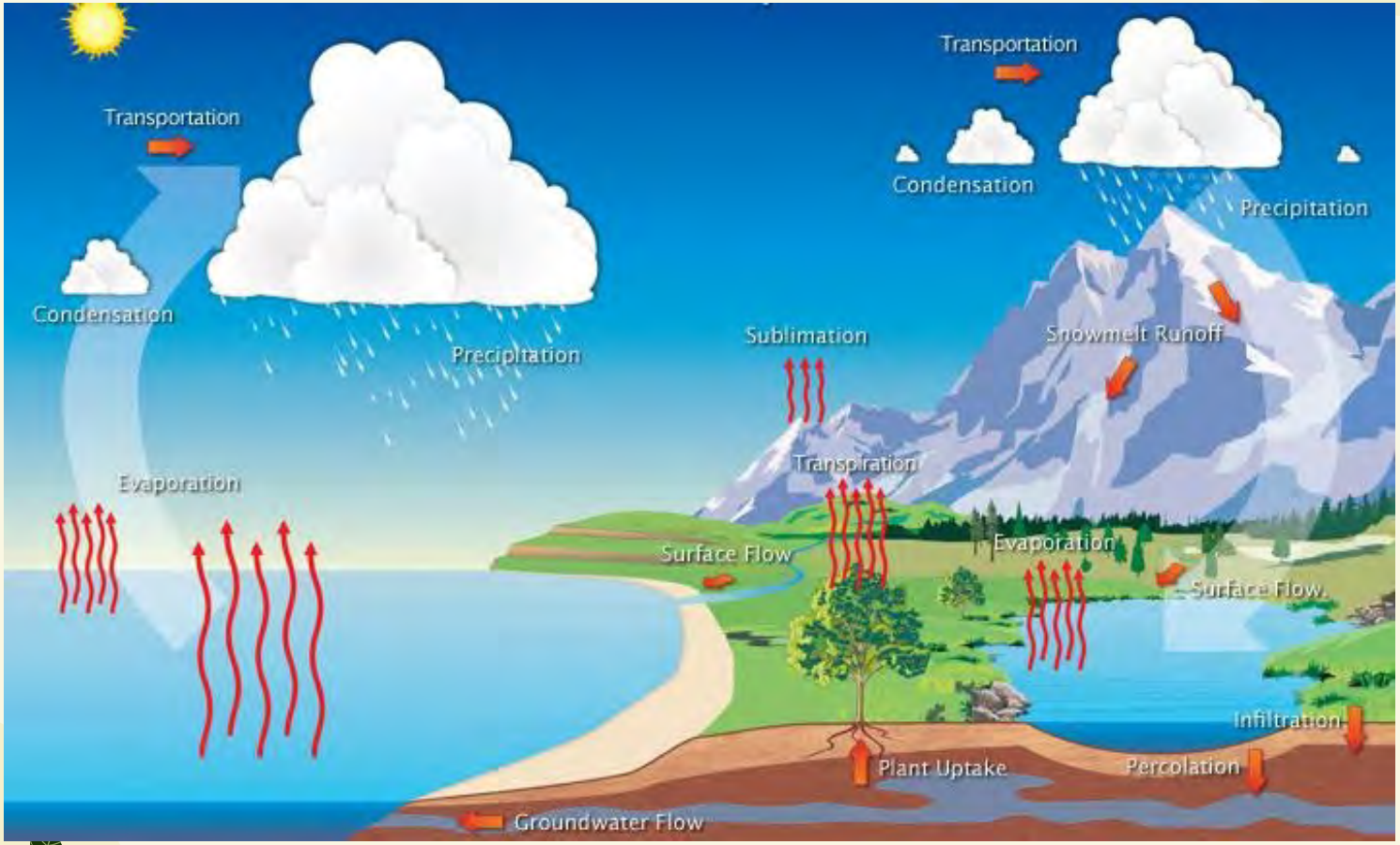
# Conventional agriculture

- It overuses pesticides and synthetic fertilisers in growing crops.
- It uses antibiotics and growth factors to breed animals.
- Reduces soil quality.
- It pollutes the environment.
- Genetically modified organisms (GMOs)



Plants (e.g. corn, soybeans) are genetically modified to make them more resistant to disease, pests or drought, or to produce higher yields. In the EU, they are regulated by the European Food Safety Authority (EFSA).

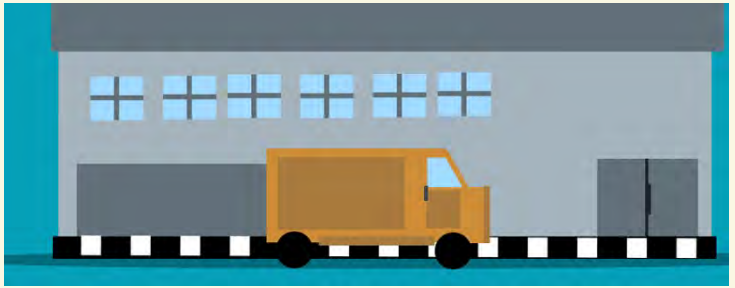
# What we discharge into nature, stays in nature




Source : https://earthobservatory.nasa.gov/features/Water/page2.php

# Food processing and transport

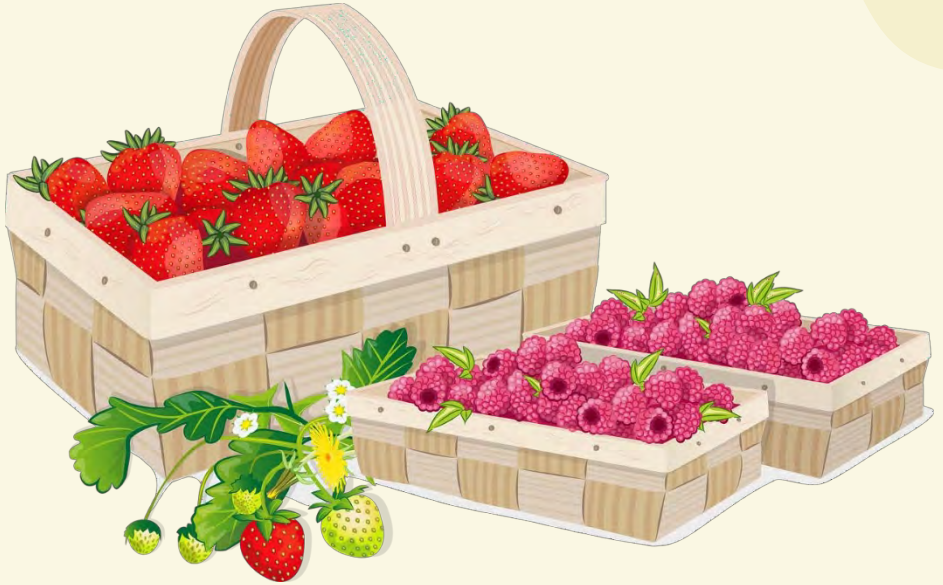
- It requires a lot of energy, often from fossil fuels, which contributes to carbon emissions.
- Excessive and unsustainable packaging increases energy consumption during production and waste production.
- Transporting goods over long distances leads to higher energy consumption and emissions.



# Choosing and buying food

**Local food**

- Significantly lower greenhouse gas emissions.
- Less environmental impact and compared to imported food.



# Choosing and buying food

- **A plant-based diet** has a **lower carbon footprint** than a diet of animal origin (meat, dairy).
- **Sustainably farmed** seafood and fish help protect marine ecosystems, prevent overfishing and promote responsible fishing practices

# Waste production

**Excessive food production, excessive packaging, use non-biodegradable materials.**

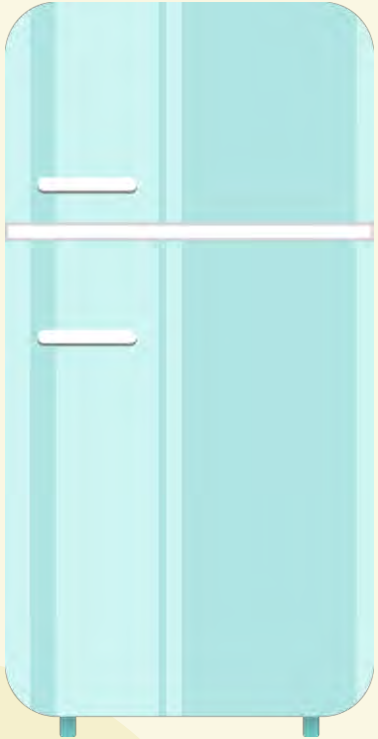
1
Production

2
Distribution

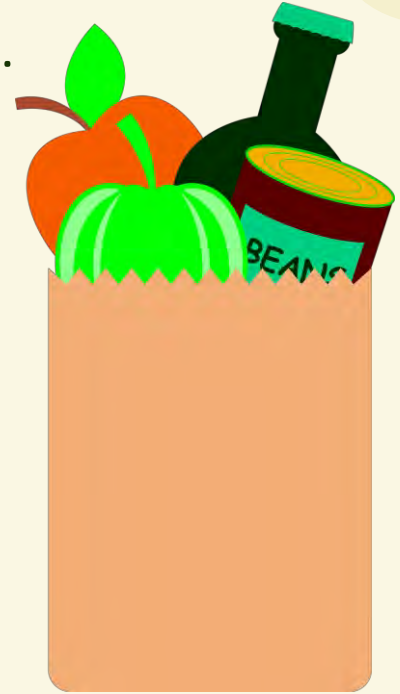
3
Retail

4
Consumer

# How to reduce food waste ?



- Plan your meals.
- Shop for groceries according to the list.
- Don't buy in bulk.
- Watch the expiry date.
- Use the leftovers.
- Compost.
- Store properly.



# How to eat sustainably ?

- Eat more food of plant origin.
- Prioritise local and seasonal food.
- Consume seafood/fish from sustainable sources.
- Eat less meat.
- Prioritise food fair trade.
- Choose eco-friendly products.
- Consume minimally processed foods.
- Grow your own fruit, vegetables and herbs.



# Double pyramid concept

Food pyramid

Recommended consumption

Environmental impact

Environmental Pyramid

Source: Ruini LF at al. Front Nutr. 2015 4;2:9. doi: 10.3389/fnut.2015.00009.

# Thank you!

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