Food & Nutrition

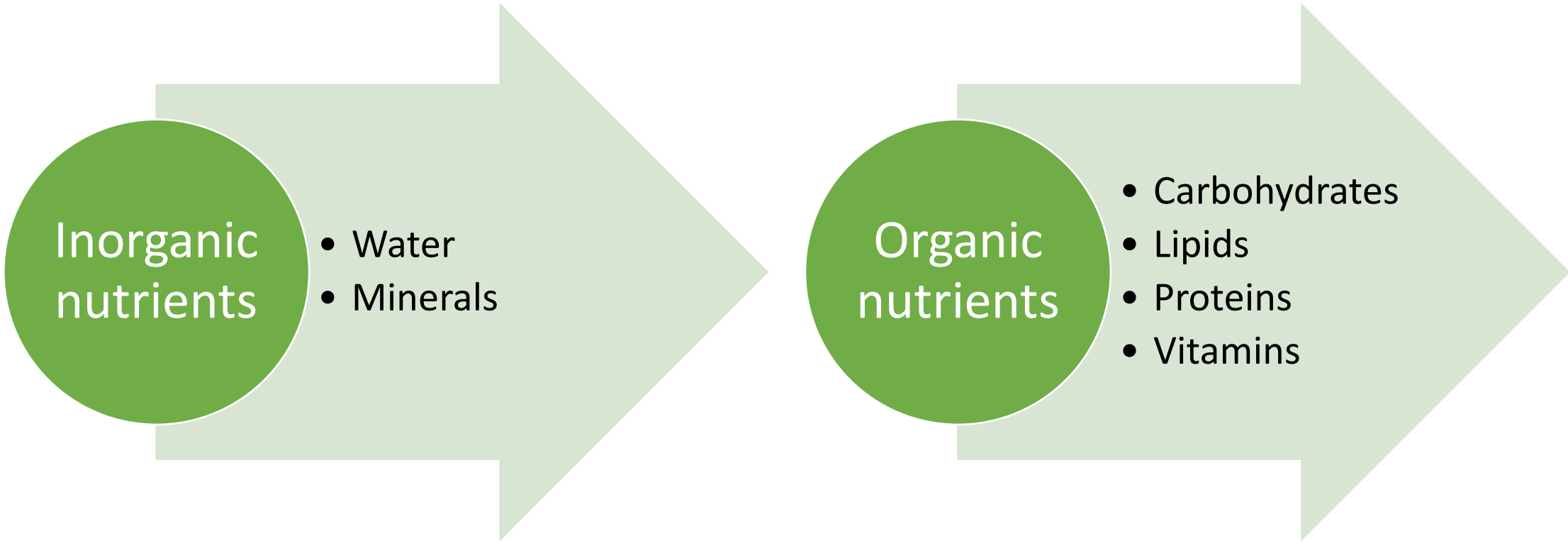
People & Health

science is a way

KEY CONCEPTS

- **Eating:**
  - The food consumption to get the nutrients.
- **Nutrition:**
  - Getting matter and energy, necessary to grow, to repair structures and to perform vital functions.
- **Nutrients:**
  - Biomolecules gotten from food that cells need to perform their functions.

Type of Nutrients



INORGANIC NUTRIENTS

- **Water**:
  - Around 63% of our body mass is made up of water
  - It's the most common molecule in our bodies
  - Functions: Other nutrients solvent and transporter; and body temperature regulator.
  - We can take water when we drink or trough food consumption.
- **Minerals**:
  - They can be structural (bones, teeth), they can control the metabolic reactions…
  - They can be found dissolved in water or in some foods (fruits and vegetables)

ORGANIC NUTRIENTS

- **Carbohydrates:**
  - They provide immediate energy to our organism
  - Sugars: Simple carbohydrates. Sweet taste.
    - Glucose, fructose, lactose and sucrose
  - Polysaccharides: Complex carbohydrates. No sweet taste
    - Starch, fibre (cellulose).

ORGANIC NUTRIENTS

- **Lipids:**
  - They are not soluble in water
  - Fats: Energetic molecules
    - Saturated fats: animal origin and solid.
    - Unsaturated fats (oils): plant origin and liquid.
  - Membrane lipids: phospholipids and cholesterol
  - Lipids with regulatory functions:
    - Vitamins A and D and sexual hormones

ORGANIC NUTRIENTS

- **Proteins:**
  - Structural molecules formed by simpler molecules called amino acids.
    - Many of them (12 out of 20) cannot be created by our own body and are called **essential amino acids**.
  - The half of the dry weight of our cells consists on proteins.

ORGANIC NUTRIENTS

- **Functions of the proteins:**
  - Structural: hair, nails, membranes…
  - Transportation: haemoglobin transports oxygen in the blood
  - Body defence against harmful microorganisms
  - Muscle contraction
  - Biological response regulation (enzymes)

ORGANIC NUTRIENTS

- **Vitamins:**
  - Needed in very small quantities to perform basic functions in our body.
  - Fat – soluble vitamins: They can be stored in the liver.
    - Vitamin A: antioxidant, it helps sight and keeps a healthy skin
    - Vitamin D: it helps the calcification of our bones.

ORGANIC NUTRIENTS

- **Vitamins:**
  - Water – soluble vitamins: They can't be stored in our body.
    - Group of vitamin B: They obtain energy from nutrients
    - Vitamin C: antioxidant, it keeps a healthy mucus.





Nutritional Needs

- The main food objective is to satisfy a range of needs via the nutrients.
  - Energy needs
  - Structural needs
  - Functional and regulatory needs
- According to the nutrients, foods are classified as:
  - Energy – producing foods
  - Body – building foods
  - Body – regulating foods

Energy Needs

- Energy – producing foods serve as sources of energy.
  - They're rich in **fats** and **carbohydrates**, which are the most energetic nutrients.
    - Proteins can be used as a source of energy if there's a lack of energetic nutrients.
- Some examples of energy – producing foods are:
  - Bread, pasta, grain products, potatoes…
  - Animal fats and vegetable oils

Energy Needs

- Energy makes possible the performance of physical activity and the warming up of the body.
  - The obtaining of energy is due to the cell respiration.
  - The energy is measured in kilocalories or kilojoules (1 kcal = 4,18 kJ)

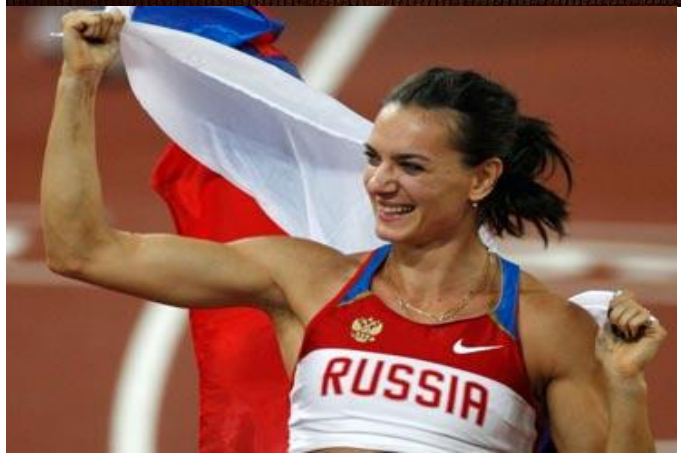
Nutrient	Calorific value	
	kJ/g	Kcal/g
Fat	37	9
Proteins	17	4
Carbohydrates	17	4
Ethanol	29	7

Basal Metabolic Rate (BMR)

- The minimum amount of energy needed in a resting and still condition.
- This energy is used in order to carry out vital functions such as respiratory rate, heartbeat, brain activity…
- BMR varies from individual to individual

Energy Use

- Depending on the physical activity, habits and lifestyles other **energy needs** varies from individual to individual.



STRUCTURAL NEEDS

- Proteins are the most important structural nutrients.
  - They’re used to build and repair biological structures.
- Also certain lipids and salt carry out this structural function
- Essential amino acids are provided in body – building foods.
  - Pulses and eggs
  - Meat and fish
  - Milk and dairy products

Functional & Regulatory Needs

- Vitamins and minerals are the most important functional and regulatory nutrients.
  - They're used to ensure the performance of metabolic reactions.
  - They're needed in small quantities.
- Some body – regulating foods examples are:
  - Vegetables
  - Fruits
  - Leafy greens

Diets

- **Food diet:**
  - The quantity of food that somebody consumes daily.
- **Balanced diet:**
  - A diet which provides the energy and the nutrients in the right proportions.
  - Those proportions vary according the age, gender, physiological state…

Balanced Diet Guidelines

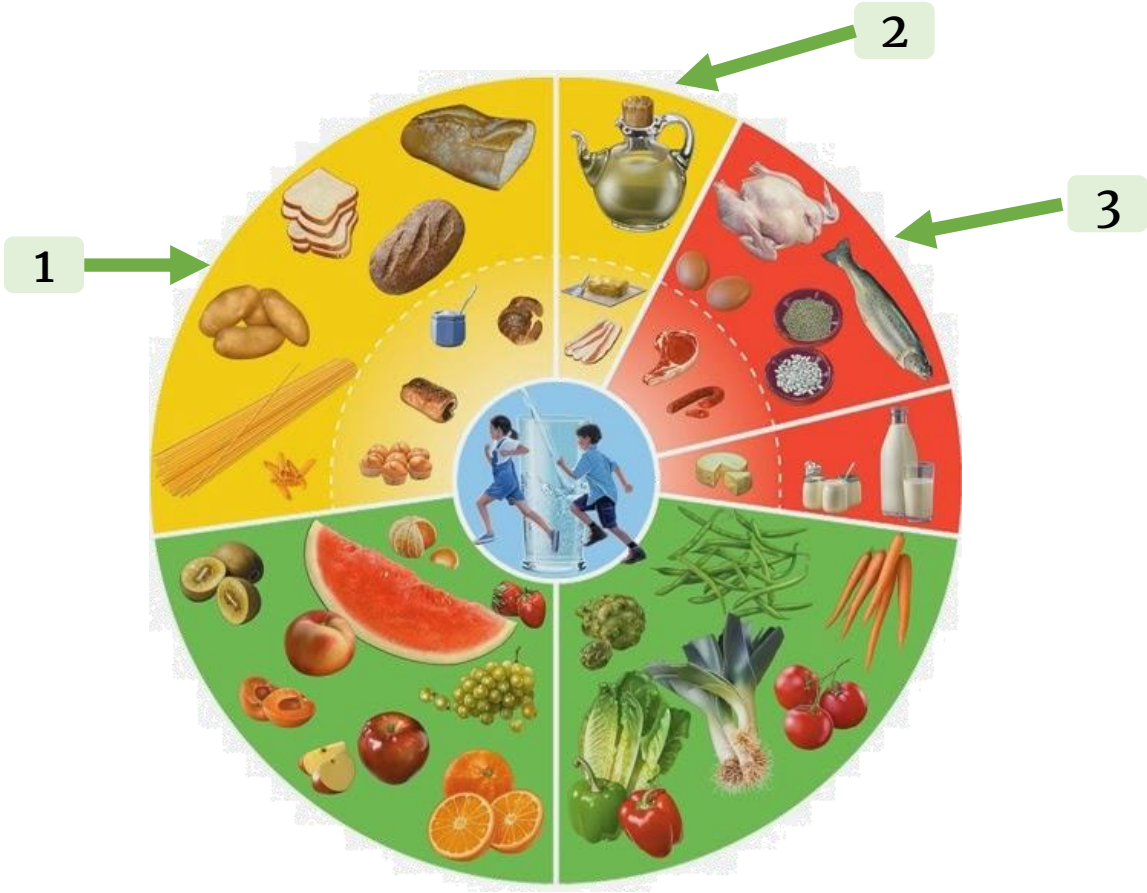
1. Variety of different foods.
   - 10 – 15% protein, 55 – 60% carbohydrates, 30% fats.
2. Have 5 meals per day.
   - It makes easier the nutrients absorption.
3. Eat fresh vegetables, source of vitamins.
4. Avoid convenience foods.

Balanced Diet Guidelines

5. Reduce saturated fats and include unsaturated fats.
6. Eat fibre – rich food
    - At least 25g per day
7. Drink preferentially water
8. Do daily exercise

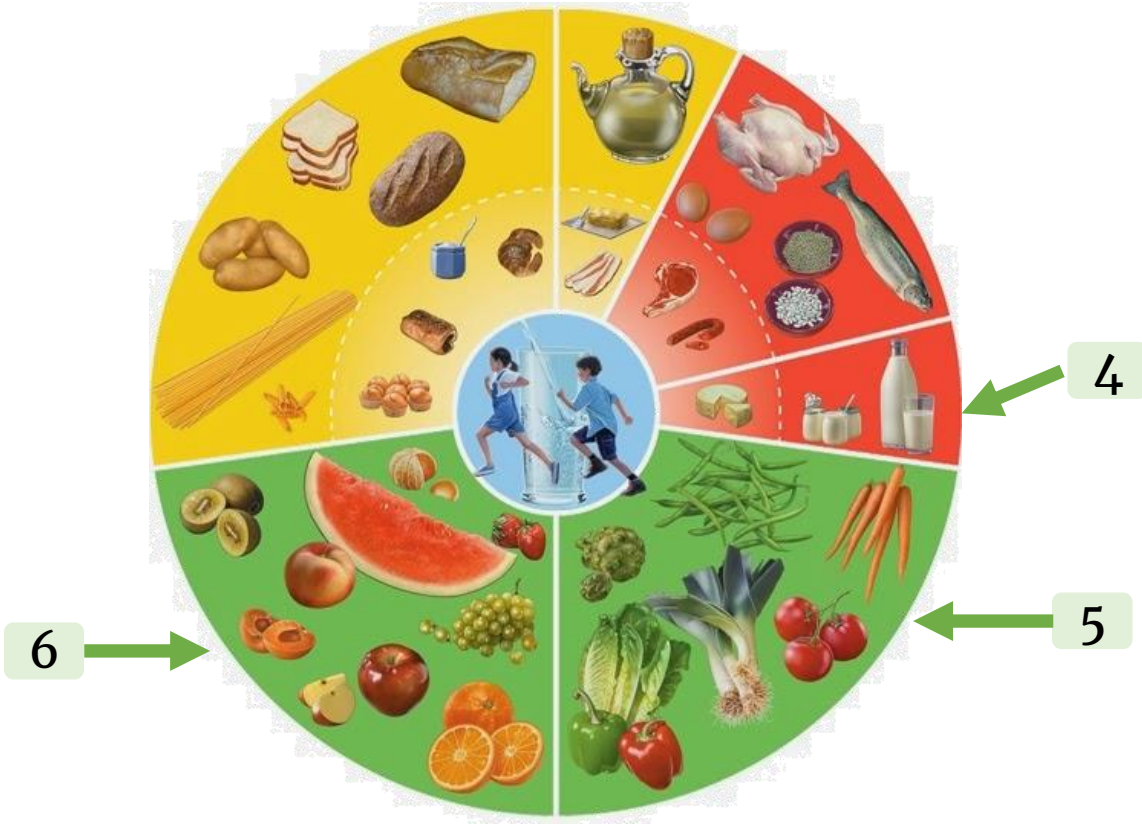
The food wheel

- **Group I:**
  - Grain products, potatoes, sugars…
  - Rich in carbohydrates.
- **Group II:**
  - Butter, oil…
  - Rich in lipids.
- **Group III:**
  - Meat, fish, pulses, eggs…
  - Rich in proteins.



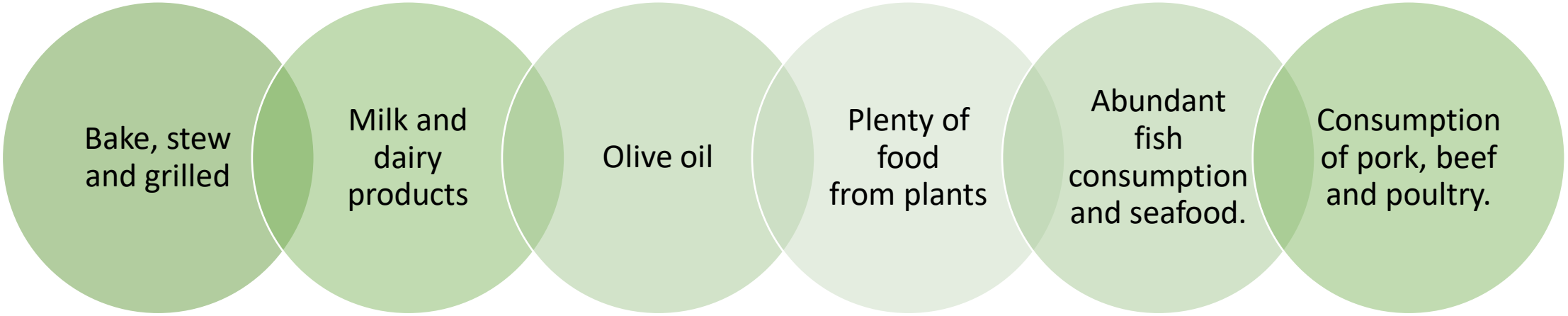
The food wheel

- **Group IV:**
  - Milk and dairy products.
  - Rich in proteins.
- **Group V:**
  - Leafy greens and vegetables.
  - Rich in vitamins and minerals.
- **Group VI:**
  - Fresh fruit.
  - Rich in vitamins and minerals.



Mediterranean Diet

Atlantic Diet



Special Diets

- **Low – calorie diets**
- **High – calorie diets**
  - Recommended to malnourished people
- **Low – cholesterol diets**
  - Recommended to people with circulatory diseases

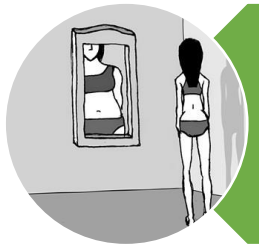
Special Diets

- **High – fibre diets**
  - Recommended to people with chronic constipation
- **Low – protein diets (LPD)**
  - Recommended to people with kidney problems
- **Soft diets**
  - Recommended to people with gastrointestinal illnesses
- **Vegetarian / vegan diets**

Food – Related Illnesses

Malnutrition

Inadequate nutrition



Eating Disorders

MALNUTRITION

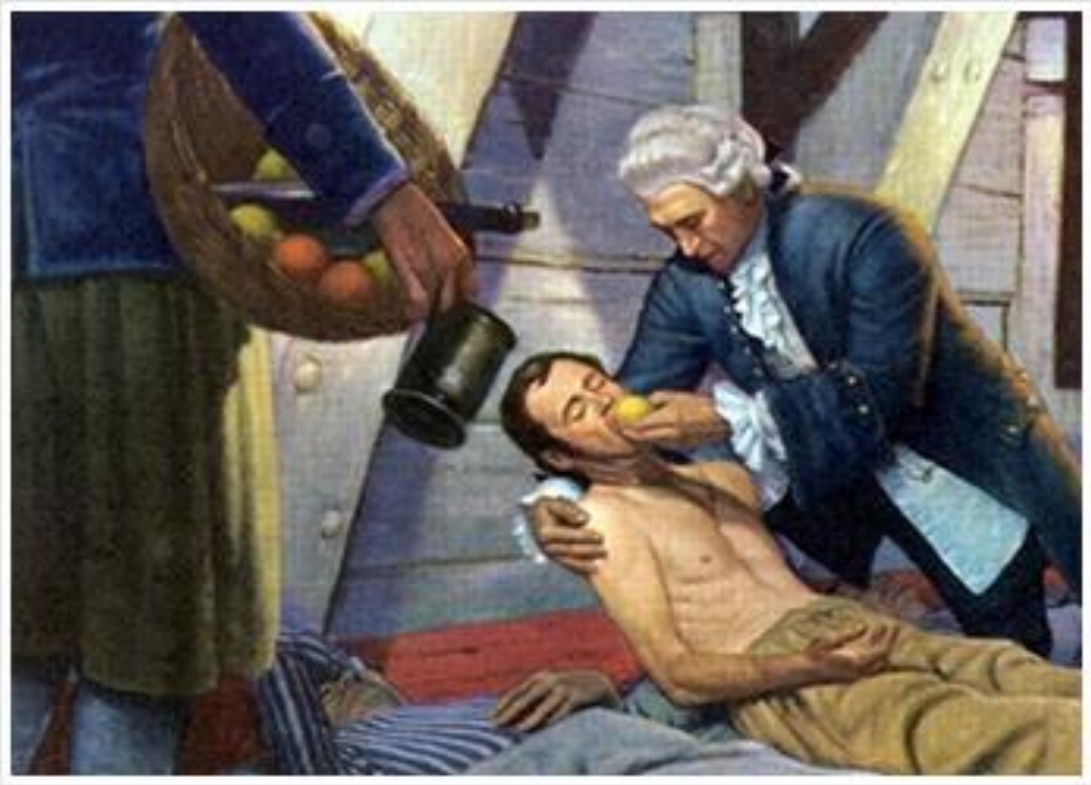
- Lack of food that contain energy and nutrients.
- It hinders children development.
  - <u>Marasmus:</u>
    - Complete lack of food
  - <u>Kwashiorkor:</u>
    - Lack of proteins

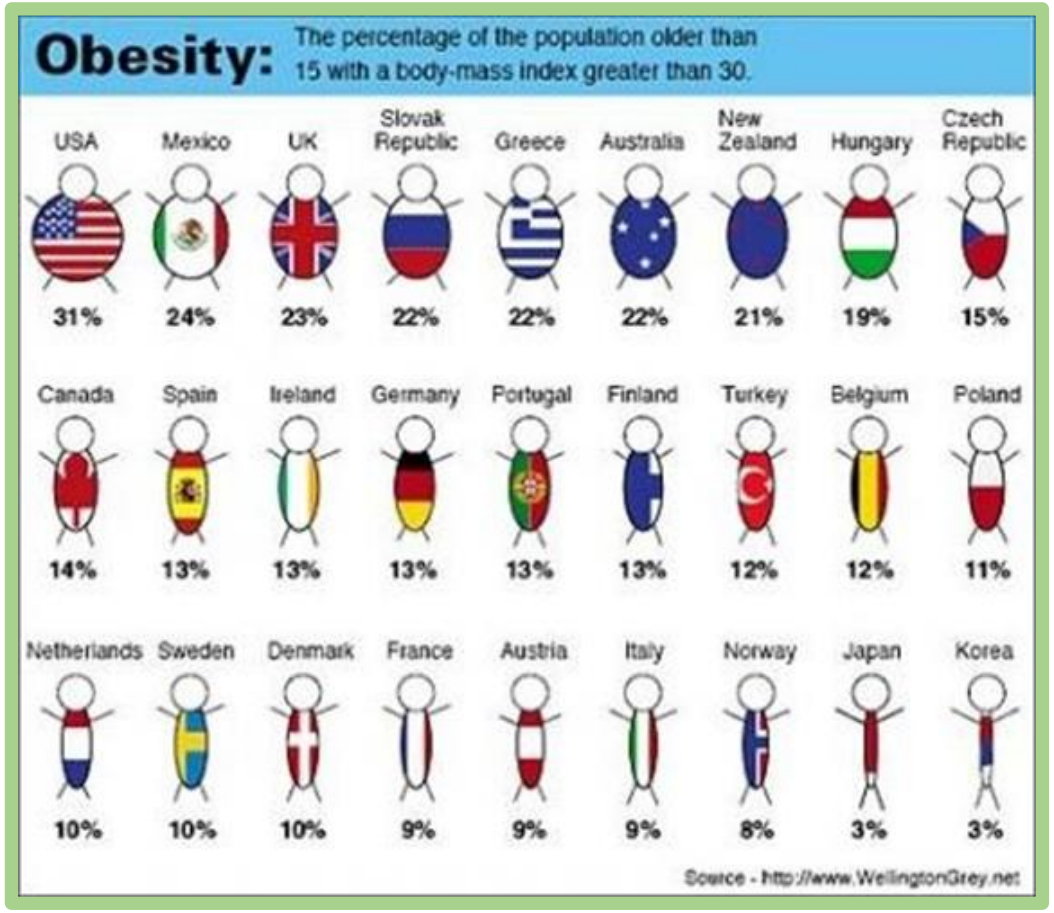
Eight children die **every minute** because their diet lacks essential nutrients.

Inadequate Nutrition

- Inappropriate consumption of foods.
- **Deficiency – related diseases:**
  - Scurvy: Lack of vitamin C
  - Beriberi: Lack of vitamin B1
  - Anaemia: Decrease of red blood cells because a lack of iron, vitamin B12…
- **Obesity:**
  - Due to the overconsumption of fat – and – sugars – rich foods, combined with genetic and social factors.
  - Risks: Heart disease, physiological disorders, skeletal issues…

Inadequate Nutrition





Inadequate Nutrition

- **Type 2 diabetes or adult diabetes:**
  - Insulin resistance due to an excessive sugar consumption, causing severe disorders.
- **Rickets:**
  - Extreme lack of calcium and phosphorous
  - Consequences:
  - Bone deformation
  - Stunted growth

Inadequate Nutrition

Eating Disorders

- **Anorexia:**
  - An eating disorder characterized by markedly reduced appetite or total aversion to food. Anorexia is a serious psychological disorder.
  - It is a condition that goes well beyond out-of-control dieting.
- **Bulimia:**
  - An eating disorder characterized by episodes of secretive excessive eating (binge-eating) followed by inappropriate methods of weight control, such as self-induced vomiting (purging), abuse of laxatives and diuretics, or excessive exercise.
  - The insatiable appetite of bulimia is often interrupted by periods of anorexia.

Eating Disorders