

# Nutrition 101



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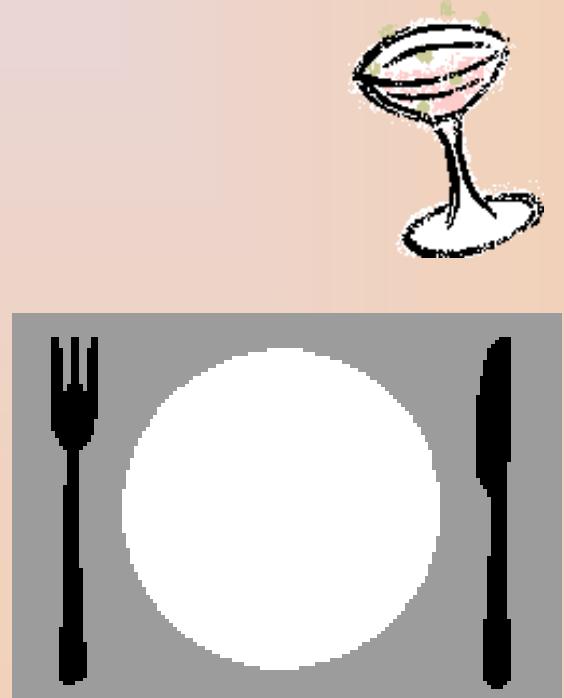
# Our Need for Food

- Food affects almost everything we do. It affects how we look, feel, and act. It even affects our abilities – how well we function every day.
- Food has an impact on life because it supplies **nutrients**, which are substances in food that body needs to function properly such as in growing, in repairing itself, and in having supply of energy.
- **Nutrition** is both a pure science and a social science. As a pure science it looks at how the body uses nutrients. As a social science it looks at the relationship between food and human behavior and the environment, or how and why people eat.

# Nutrition and Nutrients

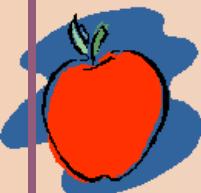
There are six types of nutrients:

- ❖ Carbohydrates
- ❖ Fats
- ❖ Proteins
- ❖ Vitamins
- ❖ Minerals
- ❖ Water



# Nutrients that Provide Energy

- A food **Calorie** is actually a kilocalorie, which is equal to 1000 calories. Calorie is useful in comparing the energy available from different foods when we are deciding what food to eat. For example, a small apple contains only 80 Calories, while a slice of apple pie contains almost 350 Calories.

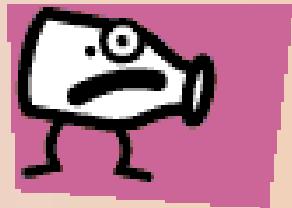


- **Carbohydrates, fats, and proteins** provide **energy** and perform other important functions.
- We need energy for all activities. When our body uses carbohydrates, fats, and proteins, energy is released: **calories**.

# Carbohydrates

- Athletes are not the only people who need carbohydrates. Everyone needs them.
- Carbohydrates are the **sugars** and **starches** found in foods. They are made up of **carbon**, **hydrogen**, and **oxygen**.
- There are two general types of carbohydrates: **simple** and **complex**.





# Simple Carbohydrates

- Simple carbohydrates are the different forms of sugar, which are easy for the body to process. These sugars are **fructose** and **glucose** (found in fruits and vegetables, **lactose** (found in milk), and **sucrose** (refined and purified to produce table sugar)).
- The most important to the body is **glucose** – the form of the sugar that goes directly to the bloodstream and provides quick energy. All other sugars must be changed into glucose by the body before the cells can use them. The cells use glucose as their primary source of energy. Glucose that is not needed immediately is converted by the body to **glycogen**, a form of starch stored in the muscles and liver, or it is converted to and stored as body fat.



# Complex Carbohydrates



- **Starches** are complex carbohydrates that are made up of many units of glucose or other sugars, which form long chains. These chains must be broken down by the body into single units of glucose before they can be used. Starches take longer than sugars to be broken down into glucose. Starches provide energy to the body over longer periods than do simple sugars. Breads, cereals, pasta, and potatoes contain starch.
- **Dietary Fiber** is another complex carbohydrate, which comes from non-digestible part of plants. There two types of dietary fiber: **soluble** and **insoluble**. Soluble fiber combines with waste and other substances to assist in their removal from the body. (Found in: oat bran, beans, apples, carrots, and other vegetables). Insoluble fiber absorbs water and helps to provide needed bulk to the diet. (Found in: whole grains and the skins and seeds of fruits and vegetables).



# Fats (Lipids)

- **Fats** are the nutrients that contains the most concentrated form of energy. Fats are type of lipid.
- **Lipids** are substances that are somewhat similar to carbohydrates, but they contain less oxygen and they do not dissolve in water.
- Fat is one of essential nutrients important for properly body function. A small daily intake of fat is required. One gram of fat provides more than twice as much energy as one gram of carbohydrate.
- Fats are part of many body tissues and are important as carriers of other nutrients, such as vitamins. Fats also carry the flavor of foods – making foods tastier, but consumption of fat should be closely monitored.

# Types of Fats

- **Saturated fats** are usually solid at room temperature. They contain maximum number of hydrogen atoms. Tropical oils, butter, and animal fats tend to be high in saturated fats.
- A diet high in saturated fats can lead to an increased chance of heart and blood vessel disease, obesity, and some types of cancer.
- **Unsaturated fats** are those fats that are liquid at room temperature.
  - Olive oil and peanut oil are called **monounsaturated fats** because they lack one pair of hydrogen atoms.
  - Fish oils and most vegetables oils, such as corn, soybean, and sunflower oils, are called **polyunsaturated fats** because they lack two or more pairs of hydrogen atoms.

# Cholesterol

- Eating foods high in fats, especially saturated fats may increase the level of **cholesterol**, a waxy, fat-like substance produced by body.
- Cholesterol is part of cell membranes and nerve tissues. It is used by body to form vitamin D and other hormones. It is found *only* in foods that come from animals, such as butter, eggs, and meats. It is not an essential nutrient because the body produces cholesterol in liver.
- As cholesterol levels in the body increase, the risk of heart and artery diseases increase. Some of the cholesterol tends to be deposited on the walls of the arteries, thereby reducing the flow of blood to the cells supplied by those arteries.

# Two Forms of Cholesterol

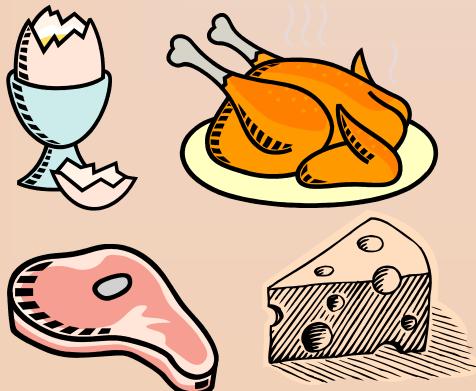
- Cholesterol is transported in the blood in two forms. LDL is the “bad” form that tends to deposit cholesterol on the walls of the blood vessels.
- HDL is the “good” form that removes cholesterol from the cells and brings it back to the liver and intestines to be recycled or excreted.
- Exercise has been proven to raise HDL, low-fat diets lower LDL.



# Protein

- **Proteins** are substances found in every cell. The body needs proteins to build and repair all body tissues. Protein is an important part of blood cells. Proteins are made up of carbon, hydrogen, oxygen, and nitrogen atoms that are formed into basic units called **amino acids**.
- There are 20 different amino acids. Nine of them are essential, and the other eleven amino acids can be produced by the body.

## Complete proteins



## Incomplete proteins

### Legumes



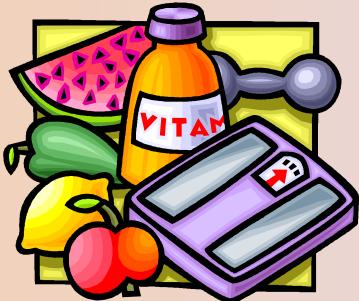
# Nutrients that Regulate

- **Vitamins, minerals, and water** are nutrients that work with the energy-providing nutrients to be sure that the body functions properly.
- Water is the most vital nutrient because it provides the means for all other nutrients to be carried throughout the body.
- Eating a variety of foods in the right amounts is usually all that is needed to get daily supply of vitamins and minerals.

- Vitamins, minerals, and water are not digested by our body, and they do not provide Calories. Instead vitamins, minerals, and water are released from foods we eat and are absorbed by the body's tissues. They work with carbohydrates, fats, and proteins to promote growth and regulate body processes.



# Vitamins

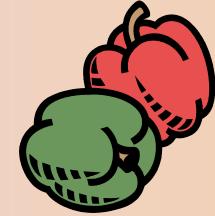
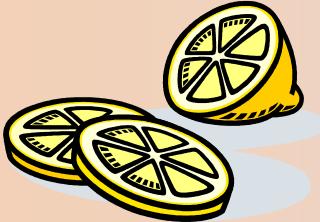


- Some diseases can develop because of lack of a particular vitamin.
- **Vitamins** are compounds found in living things and are needed in small amounts for life and growth and to prevent diseases.

- Vitamins help build bones and tissues, and they also help change carbohydrates and fats into energy.
- Because the body cannot make most vitamins, they must be supplied by the foods we eat.

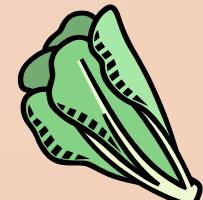
# Fat-soluble Vitamins - dissolve fat and can be stored in the body.

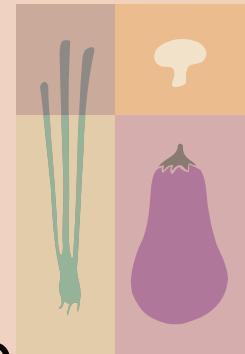
Vitamin	Sources	Functions in Body	Signs of Toxicity	Signs of deficiency
Vitamin A	Orange, yellow, green vegetables, liver, margarine, and egg yolk	Maintains healthy eyes, skin, bone growth and tooth development, possible aid in cancer protection	Nausea, vomiting, dry skin, rashes, hair loss, headache, fatigue	Night blindness, eye-infections, rough skin, respiratory infections
Vitamin D	Milk, eggs, liver, exposure of skin to sun's ultraviolet rays	Promotes absorption of phosphorus and calcium to build and maintain bones	Loss of appetite, headache, nausea, weakness, calcification of bone and soft tissue	Rickets (poor bone development), malformation of teeth
Vitamin E	Wheat germ, whole grains, vegetable oils, legumes, nuts, dark green leafy vegetables	Protects red blood cells; stabilizes cell membranes	General digestive discomfort	Rupture of red blood cells, anemia, nerve abnormalities
Vitamin K	Green leafy vegetables, liver, kale, cabbage; made in body by intestinal bacteria	Assists in normal clotting of blood	Anemia	Slow clotting of blood, hemorrhage especially in newborns



# Water-soluble Vitamins

- Water-soluble vitamins dissolve in water. Because water-soluble vitamins are not stored by the body to any extent, foods rich in these vitamins must be eaten more often than foods with fat-soluble vitamins.
- Fruits and vegetables are good source of water soluble vitamins.
- Water-soluble vitamins are: Thiamin (B1), Riboflavin (B2), Niacin, Vitamin B6, Folacin (Folic acid), Vitamin B12, Pantothenic acid, biotin, Vitamin C (Ascorbic acid).





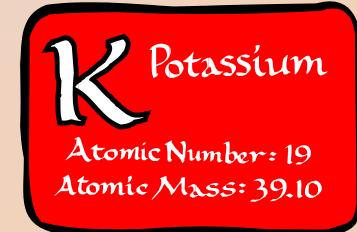
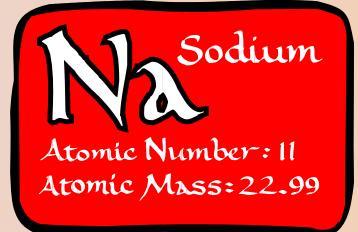
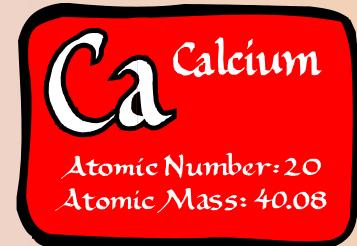
# Minerals

- Minerals are simple substances found in the environment that are essential to the body's functioning.
- Minerals are used to regulate a wide range of body processes, from bone formation to blood clotting, and they are important for the body structure.
- Most minerals are either quickly used or lost in waste products, therefore we must eat mineral-rich foods daily to replenish our supply. Iron is an exception –it tends to be kept and recycled by the body, except when there is a blood loss.

# Major Minerals:

calcium, phosphorus, magnesium, potassium, sulfur, sodium, and chlorine

- Calcium keeps the nervous system working well and is needed for blood clotting. Osteoporosis is disease caused by calcium deficiency.
- Sodium and potassium help regulate the passage of fluids in and out of cells. Too much sodium in the diet may aggravate high blood pressure or hypertension, increasing the risk of heart attack, stroke or kidney disease. Table salt is one source of sodium in the diet. Most sodium comes in food.
- Deficiency of potassium can lead to muscle weakness and abnormal heart beat.



# Trace Minerals: iron, iodine, manganese, zinc, copper, and fluorine

- The majority of the minerals needed for the body to function are only required in very small, or trace amounts.
- Iron is a vital part of hemoglobin – a substance in red blood cells that carries oxygen to all parts of the body. Insufficient iron may cause anemia, a disease in which the body has either too few red blood cells or too little hemoglobin. As result too little oxygen is carried to cells of the body.
- Iodine is needed for the thyroid gland to function properly. The thyroid gland produces hormones that control how quickly chemical reactions occur in our body. Too little iodine – thyroid gland enlarged. The primary sources are seafood and iodized table salt.



# Water

- Water is found in every cell, in the spaces around the cells, in the fluid tissues of the body, and in body cavities
- Water carries dissolved nutrients throughout our body and assists in all of its functions such as: digesting foods, removing wastes, regulating temperature, and cushioning sensitive parts of our body.
- Each day we lose two to three quarts of water and if this water is not replaced the body can dehydrate.
- When minerals are dissolved, they break apart into ions. The ions formed in body fluids are called electrolytes. These ions play a central role in water balance in the body.

