LEBANESE AMERICAN UNIVERSITY

HLT201

Chapter 1: Nutrition and healthy diet

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Introduction to nutrition

- It is necessary to have an understanding of the nutritional needs of the body, i.e. the dietary constituents and their functions within the body.

- A good balanced diet and dietary habits are essential for good health.

Healthy Diet

- A **healthy diet** is one that helps maintain or improve health.

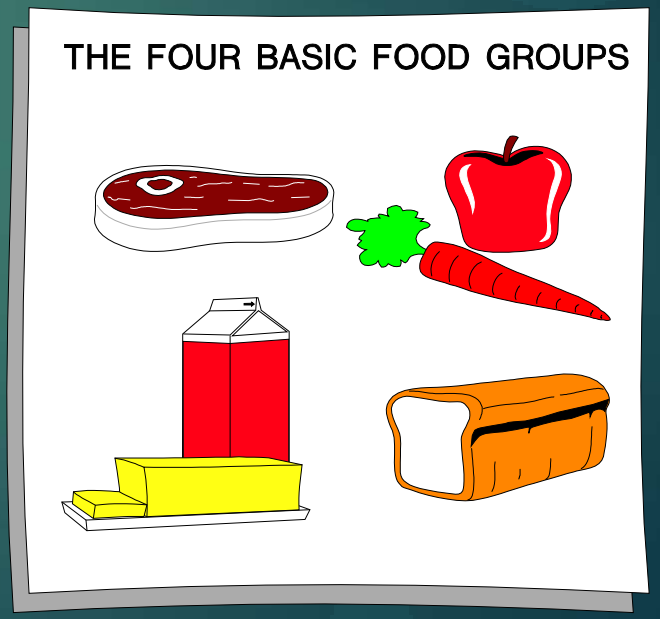
- It is important for the prevention of many chronic health risks such as: **obesity, heart disease, diabetes, and cancer**

A healthy diet involves consuming appropriate amounts of all nutrients

A ***nutrient*** *is* any substance that is digested, absorbed and utilized to promote body function.

These substances are:

- **Carbohydrates (sugars)**
- **Proteins**
- **Fats**
- **Vitamins**
- **Mineral salts**
- **Water**



Nutrients

These nutrient classes can be categorized as either:

1. **Macronutrients** :needed in relatively large amounts

2. **Micronutrients** :needed in smaller quantities

Nutrients

Macronutrients

- Carbohydrates
- Proteins
- Fats
- Fibers
- Water

Micronutrients

- Minerals
- Vitamins

Carbohydrates

Carbohydrates: 50-55% Of total daily calories

They are the principle source of energy to the body

Found in rice, noodles, bread, and other grain-based products

Carbohydrates

Simple Sugars

- Quick absorption
- Raise the blood glucose level rapidly
- e.g: Sucrose (Table sugar)

Related to Heart diseases

Complex Sugars

- Longer time to digest and absorb
- E.g: Starch

Carbohyrates

Dietary guidelines generally recommend that **complex carbohydrates (starches)** and nutrient-rich simple carbohydrates such as **fruits and vegetables**, and dairy products make up the **bulk of carbohydrate consumption**

Glycemic index

- The glycemic index of a carbohydrate represents how quickly its consumption increases blood sugar levels.
- Values range from 1 (the slowest) to 100 (the fastest, the index of pure glucose).
- The glycemic index tends to be lower for complex carbohydrates than for simple carbohydrates, but there are exceptions. For example, fructose (the sugar in fruits) has little effect on blood sugar.

Glycemic index

- The glycemic index is thought to be important because carbohydrates that increase blood sugar levels quickly (those with a **high glycemic index**) also quickly increase **insulin** levels.

- The increase in insulin may result in low blood sugar levels (hypoglycemia) and hunger, which tends to lead to **consuming excess calories and gaining weight.**

- Carbohydrates with a **low glycemic index** do not increase insulin levels so much. As a result, people feel satiated longer after eating..

Glycemic index

Consuming carbohydrates with a low glycemic index also tends to:

- result in more healthful cholesterol levels and
- reduces the risk of obesity
- Reduces the risk of diabetes mellitus and, in people with diabetes, the risk of complications due to diabetes

Proteins

Proteins

- The most abundant substances in the body
- Basis of body structures: muscles, bones and hair
- Few amount is used for energy production
- **Requirement is 60 g/day, 10- 15% of total calories**

Sources:

Animal: Meat/ Egg/ Dairy products/ Fish/ Chiken

Plant: Soy/ Grains/ Legumes

Proteins

Animal Proteins

- Complete as they contain all the essential amino acids which the body can't make
- Also contains saturated fats which increase the CHD risk

Plant Proteins

- Partially complete as they lack few essential acids
- Can be combined together to form a full protein
- Less risk of heart diseases

Vegan Protein Sources

By VEGANS OF INSTAGRAM

Seitan
31g (3 oz)

Soy Beans
29g (1 cup)

Tempeh
41g (1 cup)

Wheat Germ
33g (1 cup)

Beans
Black 15g (1 cup)
Kidney 13g (1 cup)
Pinto 12g (1 cup)
Garbanzo 12g (1 cup)

Lentils
18g (1 cup)

Quinoa
9g (1 cup)

Buckwheat
24g (1 cup)

Tofu 11g (1 cup)

Seeds

Pumpkin 8g (1 oz)
Sunflower 5g (1 oz)

Peas 9g (1 cup)

Wild Rice
7g (1 cup)

Raisins
5g (1 cup)

Avocado
4g (1 med)

Nuts
Peanuts 7g (1 oz)
Almonds 6g (1 oz)
Pistachios 6g (1 oz)
Cashew 5g (1 oz)
Brazilian 4g (1 oz)
Walnuts 4g (1 oz)

Spinach
5g (1 cup)

Artichoke
4g (1 cup)

Brussels Sprouts
4g (1 cup)

*Peanuts are technically a legume

Functions of proteins

- Growth and repair of body cells and tissues
- Synthesis of enzymes, plasma proteins, antibodies (immunoglobulins) and some hormones
- Provision of energy.
- When protein is eaten in excess of the body s needs, it is converted to fat.

Fats/ Lipids

Fats

The **type of the fat** consumed is more important than

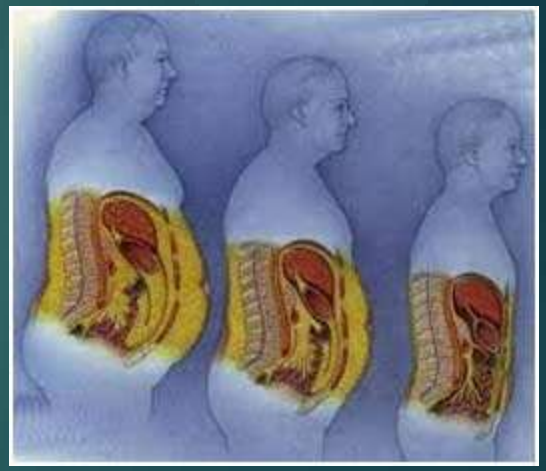
the amount of total fat

They are packed with calories : **Provide 9 Cal/g**
compared to 4 Cal /g in proteins and carbs

Fats

- Recommendations **Fat should contribute to <30% of total calories**

- The body stores excess fat in:
- Abdomen (omental fat)
- Skin (subcutaneous tissue)
- Blood vessels leading to atherosclerosis
- In organs as liver leading to dysfunction

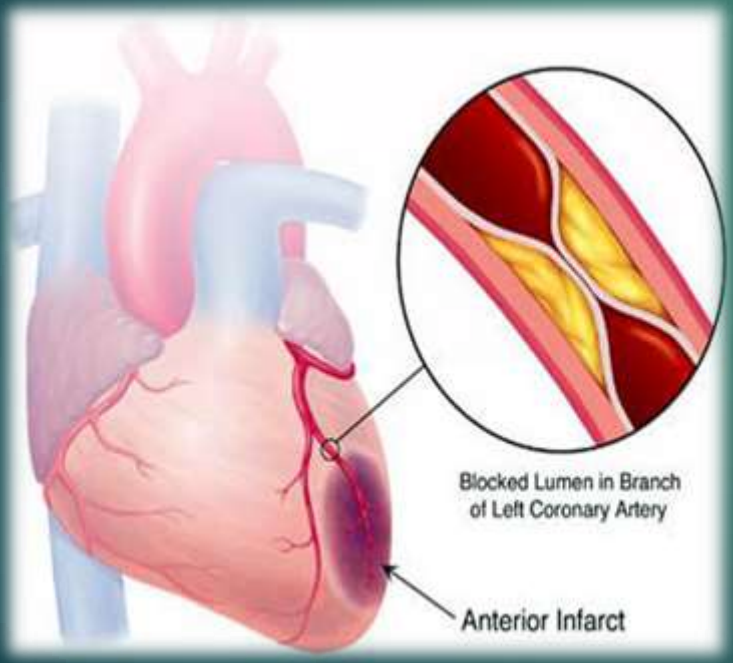


Functions of fats

- **Provision of a source of chemical energy and heat**
- Storage of energy as fat in adipose tissue under the skin when eaten in excess of requirements
- Insulation as a subcutaneous layer it reduces heat loss through the skin
- **Satiety when gastric contents containing fat enter the duodenum, the emptying time of the stomach is prolonged, postponing the return of hunger.**

Fats

Associated with increased cholesterol levels in the body and coronary heart diseases



Fats

Saturated

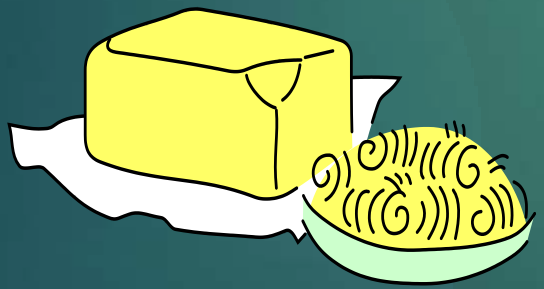
Unsaturated

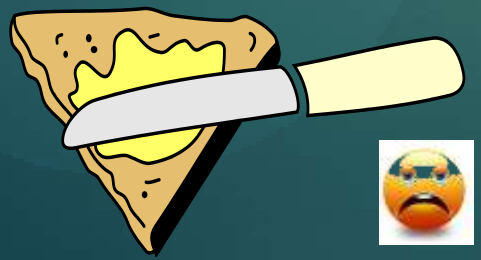
- Monounsaturated
- Polyunsaturated
- Transfats

Fats

Saturated

- Solid at room temperature
- Animal source: cheese, butter, red meat, whole milk





Unsaturated fats

- Liquid at room temperature
- E.g: Oils

Transfats

These are rare in nature and in foods from natural sources;

They are typically created in an industrial process called partial hydrogenation.

Omega 3 fatty acids

- A diet rich in omega-3 fatty acids may reduce the risk of coronary artery disease.
- Lake trout and certain deep-sea fish contain large amounts of omega-3 fatty acids.

Lipids and cholesterol level

Different types of dietary fat have different effects on blood levels of cholesterol:

- Monounsaturated fats tend to lower LDL and raise HDL 
- Polyunsaturated fats tend to decrease both types of cholesterol;
- Saturated fats tend to either raise HDL, or raise both HDL and LDL;
- **Trans fat tend to raise LDL and lower HDL.** 

Lipids

Type of Fat	Source
Monounsaturated	Avocado, olive, and peanut oils Peanut butter
Polyunsaturated	Canola, corn, soybean, sunflower, and many other liquid vegetable oils
Saturated	Meats, particularly beef Full-fat dairy products such as whole milk, butter, and cheese Coconut and palm oils Artificially hydrogenated vegetable oils

Type of fat	Source
Omega-3 fatty acids	Flaxseed Lake trout and certain deep-sea fish, such as mackerel, salmon, herring, and tuna Green leafy vegetables Walnuts
Omega-6 fatty acids	Vegetable oils (including sunflower, safflower, corn, cottonseed, and soybean oils) Fish oils Egg yolks
Trans fats	Commercially baked foods, such as cookies, crackers, and doughnuts Some french fries and other fried foods Margarine Shortening Potato chips

Fibers


Fiber
Food sources of fiber include whole wheat, bran, fresh or dried fruits, and vegetables

Fibers

- Dietary fiber consists of **the indigestible part** of plant foods: Mechanical benefit

Ex: Pectin, cellulose, gum…

- Decrease the risk of coronary heart disease and stroke,protects against type 2 diabetes, and colon cancer, **prevents constipation**

- **Sources**:

Whole grains/ Breakfast cereals/ Fruits and vegetables

To meet your fiber requirements: **30g/day**

- Eat plenty of fresh fruits and vegetables
- Eat a whole fruit rather THAN FRUIT JUICE
- Do not overcook vegetables and eat some raw
- Eat the skin of fruits and vegetables
- Choose whole grain cereals, wholemeal bread

Water

WATER

NO CALORIC VALUE

Water

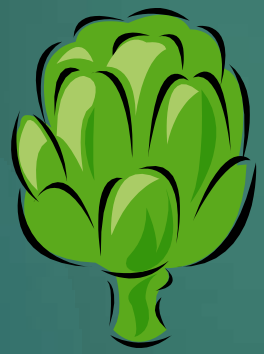
- It constitutes 70% of non fat mass of the body
- Requirements: 8-10 glasses daily (2Liters)
- 20% of water intake comes in food
- A large amount of water is lost each day in feces, sweat, breath, and urine.

FUNCTIONS OF WATER

- provision of the moist internal environment which is required by all living cells in the body,
- participation in all the chemical reactions which occur inside and outside the body cells
- regulation of body temperature

Vitamins

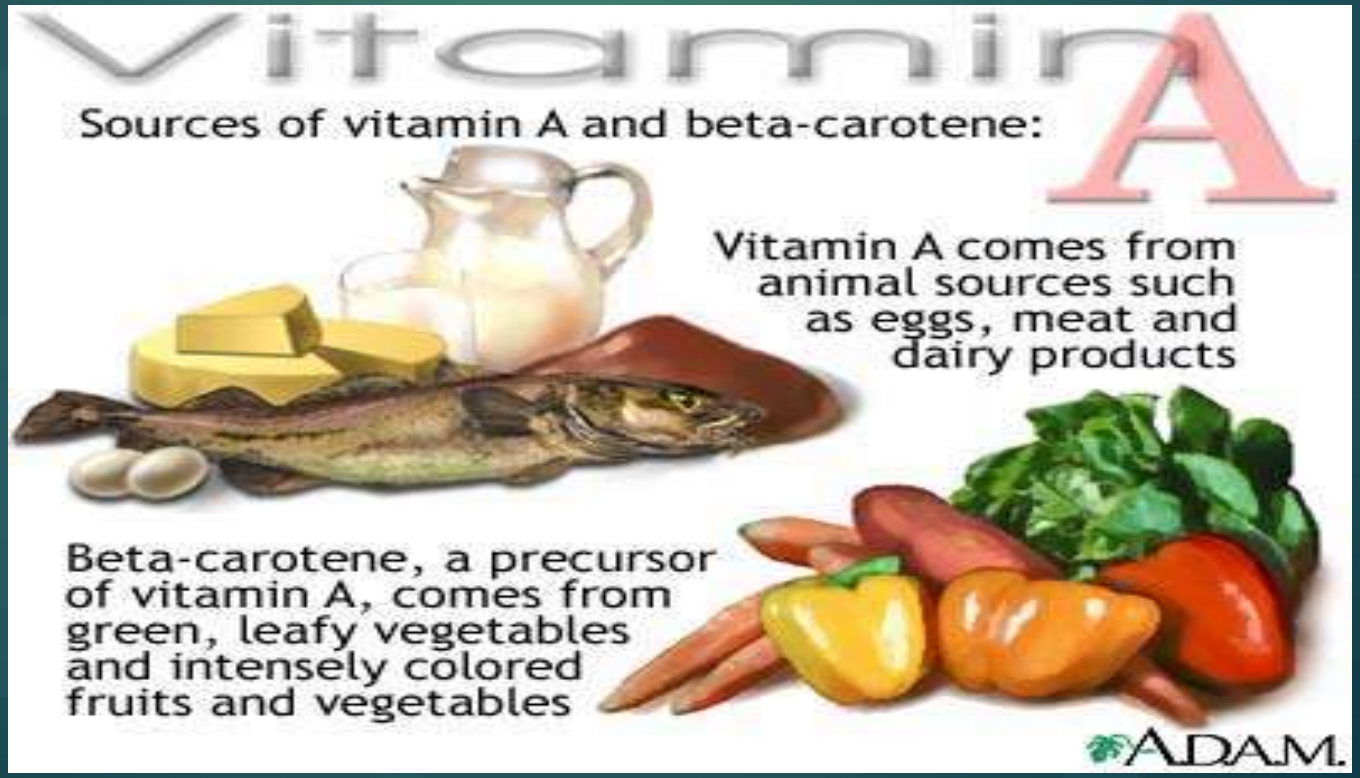
VITAMINS



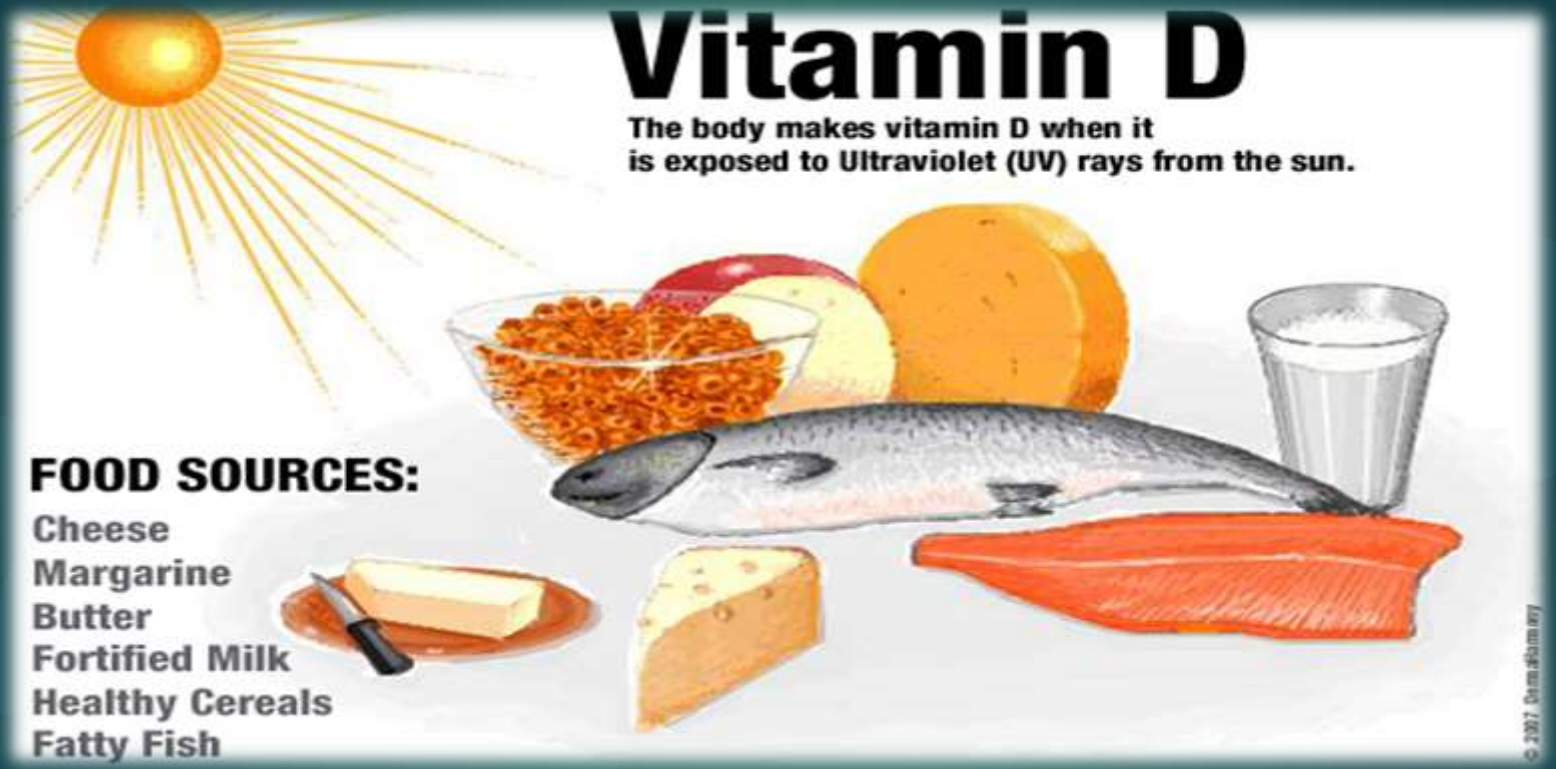
- Water Soluble: B, C.
- Fat Soluble: A,D,E,K.
- **NO** caloric Value

Vitamins

- Vitamin A (retinol): Night vision



Vitamin D

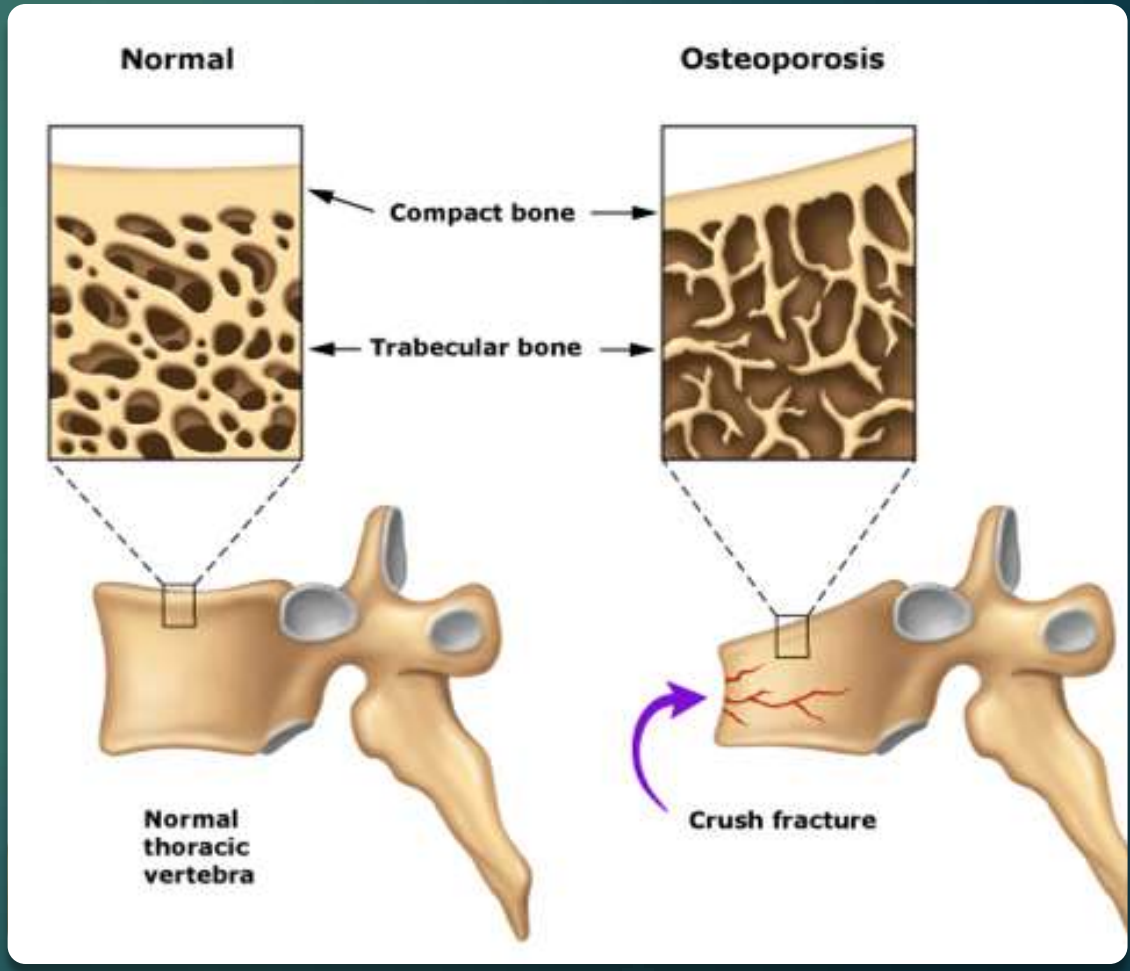


Vitamin **D** regulates calcium and phosphate metabolism

Deficiency result in **Osteoporosis**

Vitamin D

Adequate calcium and vitamin D intake are important, particularly in women, to reduce the risk of osteoporosis in which bones become weak, thin and easily fractured

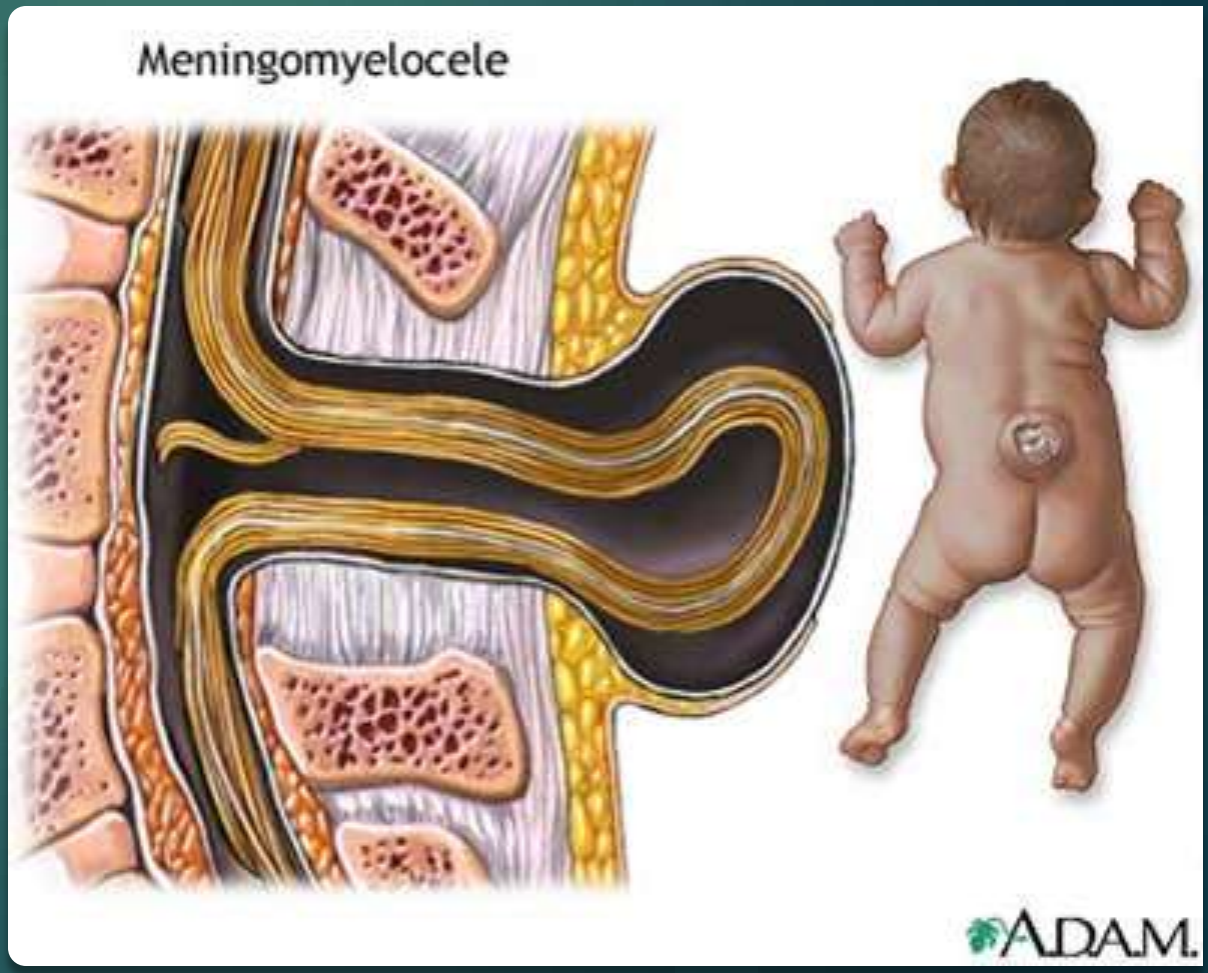


Folate

Folate is a type of B vitamin that is important in the production of red blood cells.

Folate

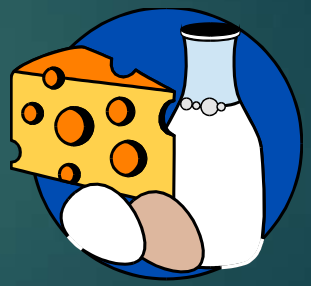
Low levels of folate in pregnant women have been linked to a group of birth defects called neural tube defects, which includes spina bifida and anencephaly.



MINERALS

- Iron
- Calcium
- Sodium

NO Caloric Value



Iron

- Iron is an essential element for blood production.

- Mostly found in the red blood cells as hemoglobin, which transfers oxygen in the blood
- It is also a component of certain proteins essential for body functions

- Some foods rich in iron include:
  - Meat and Poultry
  - Seafood
  - Vegetables (Greens, beans…)

- **Iron deficiency causes anemia**

Antioxidants

Antioxidants are substances that may protect your cells against the effects of free radicals.

Free radicals are molecules produced when your body breaks down food, or by environmental exposures like tobacco smoke and radiation.

Free radicals can damage cells, and may play a role in heart disease, cancer and other diseases.

Antioxidants are found in many foods. These include fruits and vegetables, nuts, grains, and some meats, poultry and fish.

Antioxidants

Antioxidant substances include

- Beta-carotene
- Lycopene
- Selenium
- Vitamin A
- Vitamin C
- Vitamin E

Healthy eating guidelines

PYRAMID/ PLATE

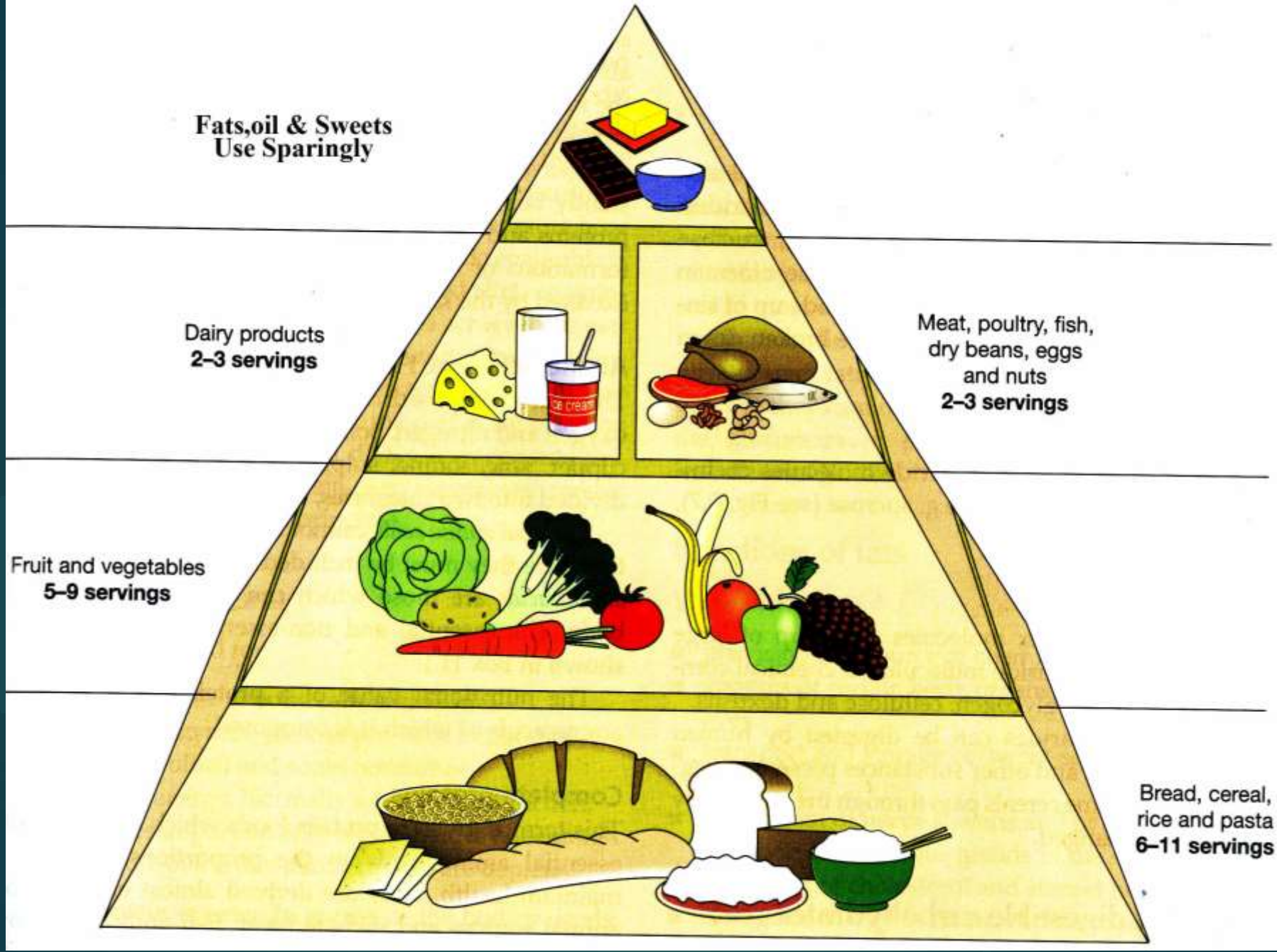
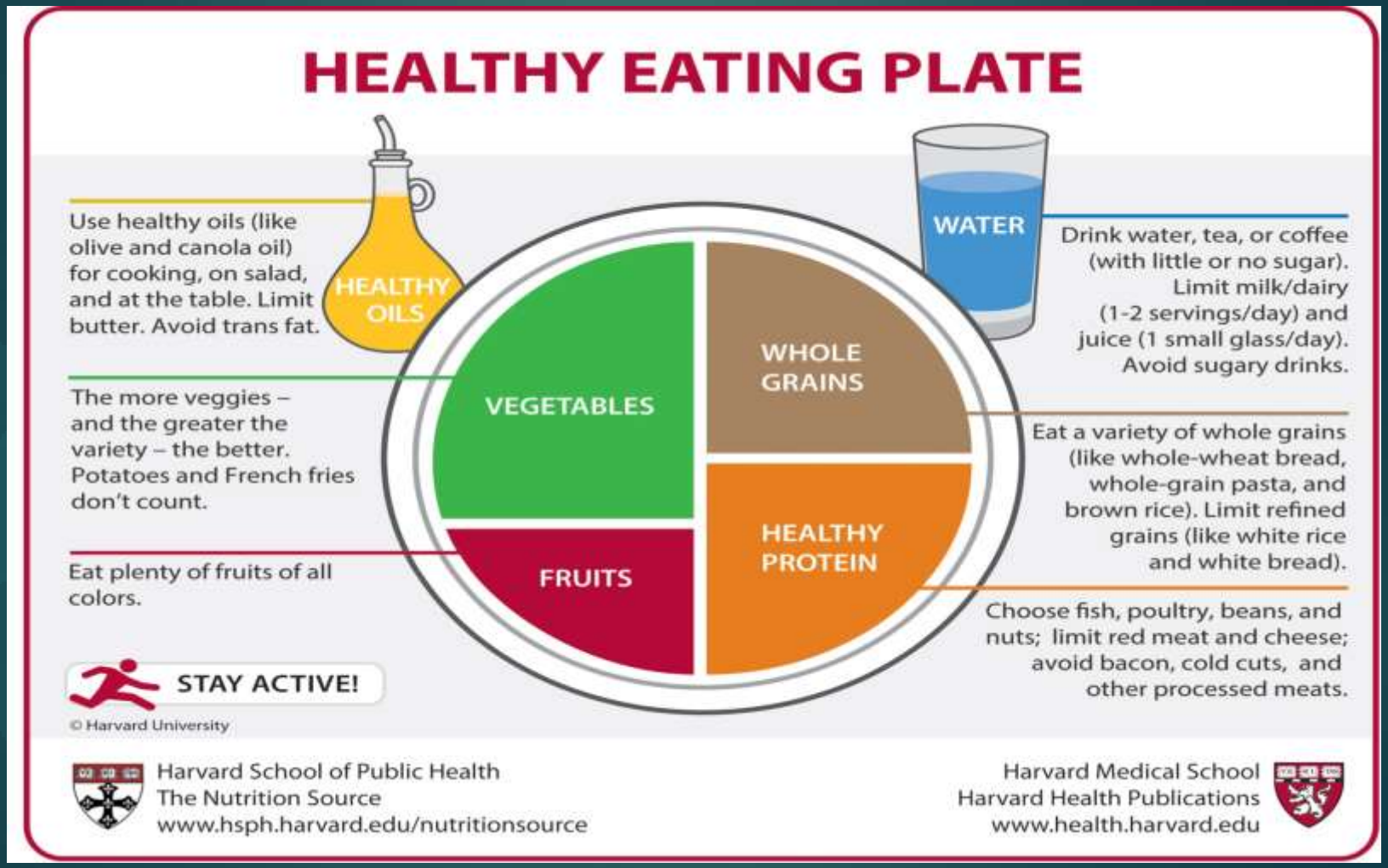


Figure 1: The main food groups and their recommended proportions within a balanced diet

Healthy Eating plate



WHO recommendations

The WHO makes the following 5 recommendations for a healthy diet:

- Achieve an energy balance and a healthy weight
- Limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids
- Increase consumption of fruits and vegetables, whole grains and nuts
- Limit the intake of simple sugar. A 2003 report recommends less than 10% simple sugars.
- Limit salt/ sodium consumption from all sources and ensure that **salt is iodized**

Healthy Diet

- Limit intake of refined sugars
- Limit the intake of fat especially saturated fat (use Low fats when possible)
- Avoid transfats
- Limit your sodium intake (substitute with herbs and spices)
- Reduce your consumption of artificial colorings, preservatives and other food additives
- Eat more fruits and vegetables (whole fruits)
- Drink enough water
- Get your calcium rich foods

Summary

- The first principle of a healthy diet is simply to eat a wide variety of foods.
- You should also try to maintain a balance between calorie intake and calorie expenditure—that is,

"don't eat more food than your body can utilize"

THANK YOU