

# NUTRITION

**Essential Nutrients:** needed to build, maintain, and repair tissues and regulate body functions

**Macro-nutrients:** needed in large amounts

- water
- carbohydrates
- proteins
- fats

**Micro-nutrients:** needed in small amounts

- vitamins
- minerals

**Fuel Potential:** a k-calorie is the amount of energy needed to raise the temperature of 1 kilogram of water by 1 degree centigrade

- 3 macro-nutrients supply energy...fat (9 calories/gram), protein (4 calories/gram), carbohydrates (4 calories/gram)

## Water

- digests, absorbs, transports nutrients
- helps regulate body temperatures
- carries waste out of body
- lubricates our body parts

## PROTEINS

**Function:** --build and maintain muscles and bones, parts of blood, hormones, cell membranes

- form enzymes that facilitate chemical reactions

**RDA:** 36 grams per pound of body weight

**Made of:** 20 different amino acids...9 essential amino acids, 11 non-essential

**Sources: complete** (ample amount): meat, poultry, cheese, fish, milk, eggs

**Incomplete** (not ample): grains, nuts, legumes, seeds, other vegetables

**Mutual supplementation:** nutritional strategy of combining two incomplete protein sources to provide a complete protein

- example: red beans and rice, cheese and pasta

## FATS

**Saturated fats:** found in animal products and other fats that remain solid at room temperature

**Sources:** pork, poultry, whole-milk dairy products, certain nuts (macadamia)

**Mono-saturated fats:** found primarily in plant sources, are liquid at room temperature and semi-solid or solid when refrigerated

**Sources:** olive, safflower, peanut and canola oils, avocados, many nuts

**Poly-unsaturated fats:** found primarily in plant sources, commonly referred to as "oil," are liquid at room temperature when refrigerated

**Sources:** corn and soybean oils, fish, trout, salmon, anchovies

**Trans fats:** liquid vegetable oils that have been chemically changed through process of hydrogenation

--reuse oil for frying, improve textures, prevent separation of fatty oils, extend shelf life of processed foods

--trans fats pose risk to cardiovascular health by raising LDL levels and lowering HDL

--examples: cookies, chips, cakes and pies, doughnuts, deep fried food (fries)

## **CARBOHYDRATES**

**Function:** --body's main source of energy

--fuel most of the body's cells during daily activities

--only source of energy for brain cells, red-blood cells, and some other types of cells

**Simple Carbohydrates:** quick energy source, easily digestible and composed with 1 or 2 units of sugar

**Examples:** sucrose, glucose, lactose, fructose, maltose

**Complex Carbohydrates:** energy source, slower to digest and composed of multiple sugar units, includes starches and dietary fibers

**Examples:** whole grains, vegetables, some fruits

**Fiber:** plant carbohydrates that cannot be easily digested

**Dietary Fiber:** present naturally in grains, fruits, vegetables, nuts, seeds

**Functional Fiber:** natural sources or synthesized in a lab, added to food

**Total Fiber:** sum of dietary and functional fiber

## **Refined Grains vs. Whole Grains**

--grains can be refined (processed) or unrefined (whole grains)

--whole grains contain inner layer (germ), middle layer (endosperm), outer layer (bran)

--during processing, germ and bran removed leaving starch of endosperm

--refined grains have some calories but less fiber, vitamins, minerals

--whole grains take longer to digest, make people feel full longer

--consuming whole grains linked to reduce risk of heart disease, stroke, high blood pressure, diabetes, cancers

## **Vitamins**

- naturally occurring organic substances needed in small amounts
- regulate chemical reactions within cells
- serve as catalysts for releasing energy from carbohydrates, nutrients, fats
- help maintain components of the immune, nervous and skeletal systems
- body needs at least 11 specific vitamins: A, C, D, E, K and B complex vitamins
- four are fat soluble (A, D, E, and K)
  - may be stored in liver and body fat

### **Minerals**

- naturally occurring inorganic substances needed by the body in small amounts
- build strong bones and teeth and help carry out metabolic processes and regulate body functions
- the body needs 20 essential minerals...
  - Macrominerals:** calcium , chloride , magnesium , potassium , and sodium
  - Microminerals:** chromium, cobalt , copper , fluoride
- a balanced diet provides all the essential minerals the body needs per day
- insoluble, can be toxic if consumed in large amounts

### **Phytochemicals**

- substances naturally produced by plants
- may keep cells healthy, show tissue degeneration, prevent carcinogens, reduce cholesterol, maintain hormone levels, keep bones strong

#### **3 important types:**

**Antioxidants:** neutralize free radicals

**Phytoestrogens:** plant hormones may lower cholesterol and reduce risk of heart disease

**Phytonutrients:** substances from vegetables used in supplements...believed to inhibit growth of cancer and heart disease