OVERVIEW – CHAPTER 13 (NUTRITION)

Proper nutrition and exercise are two of the most valuable tools for developing and maintaining a healthy body.

6 Essential Nutrients
- carbohydrates, protein, fat, water, vitamins and minerals
  - only (carbohydrates, protein & fat) can provide energy for the body
  - no energy can be obtained from (water, vitamins & minerals) in and of themselves, but they play major roles in many chemical processes of the body; that result in energy production

  calorie = kilocalorie (a measure of the value of foods to produce heat and energy in the body) -- the amount of heat required to raise the temperature of 1 gram of water 1 degree C
  alcohol = 7 kcal/g

Carbohydrates = 4 kcal/g
  - primary source of energy for the body
  - should constitute approx. 60% of your diet with refined sugars representing 10% of this amount
  - carbohydrates (sugar and starches) are broken down into glucose which is absorbed into the blood and used by cells
  - glucose is stored as glycogen in the muscles and liver
  - glycogen is the preferred fuel for aerobic exercise
  - excess glucose may be converted into fat and stored as adipose tissue

  Two types of Carbohydrates
  - Simple - natural sugars found in fruits and refined sugar
    - easily digested and rapidly absorbed into the bloodstream
  - Complex - (starches) such as whole-grain cereals and vegetables
    - generally not easily digested and are more slowly absorbed into the bloodstream

  Fiber – is made of a chain of complex chains of carbohydrates
  - (roughage) food substance that the body can’t fully digest
  - human digestive system lacks the enzymes to break them down
  - inclusive of grains, fruits and vegetables

Protein = 4 kcal/g
  - build and repair body tissues, to make hemoglobin, form antibodies, produce enzymes and hormones and when necessary to supply energy
  - should constitute 10-12% of your diet
  - broken down into amino acids (AA)
  - 9 essential amino acids that the body cannot manufacture; complete amino acids contain all 9 essential AA
  - incomplete contain some of the essential AA; 2 incomplete may = a full complement of AA
  - excess protein; extra amino acids may be converted to fat and stored
  - sources – meat, poultry, eggs, milk, whole grains, legumes (beans and peas), pasta, rice & seeds

Fat = 9 kcal/g
  - an essential part of every cell in your body
  - should constitute no more than 30% of your diet and (<10% = saturated fat)
  - absolute minimum body fat men (3-6%) and women (8-12%)
  - excellent source of concentrated energy, insulation from cold and carries fat-soluble vitamins (A,D,E & K)
  - made up of fatty acids and glycerol
  - triglycerides (3 fatty acids and one glycerol); saturated, monosaturated or polyunsaturated
**saturated fats** – related to elevated blood cholesterol, stroke, and coronary heart disease
- generally but not always solids at room temperature -- animal fats, butter, cheese, chocolate, coconut and palm oils

**unsaturated fats** – generally liquids or soft solids at room temperature

**polyunsaturated fats** – oils (corn, soybean, cottonseed, safflower, sesame, and sunflower, fish, some nuts (walnuts, pecans, flaxseed) and most margarines

**monounsaturated fats** – peanut, olive and canola oils; avocados, olives and some nuts (peanuts & cashews)

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**Cholesterol** - fatty substance found in the blood and in body tissues
- naturally synthesized by the body for the formation of bile salts for fat digestion
- transported through the blood via lipoproteins
- desirable level of total cholesterol is below 200 milligrams per deciliter (mg/dl)

**High-density lipoprotein (HDL)** - picks up cholesterol from blood/cells to liver to make bile salts
- termed the garbage man of the blood; picks up cholesterol and dumps it in the liver
- 35 mg/dl is considered low and a risk factor for coronary artery disease; 60 mg/dl or greater is consider protective

**Low-density lipoprotein (LDL)** - “Bad” Cholesterol
- carries cholesterol and deposits it along the wall of the arteries
- fatty deposits (plaque) build up, the arteries become narrow and clogged (atherosclerosis)
  potentially accompanied by hardening of the arteries (arteriosclerosis) either lead to coronary heart disease
- combination of diet and exercise is the best way to control cholesterol levels

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**Water**
- constitutes 70% of body’s weight
- solvent for digestion, waste removal; major component of blood and lubricant found in and around joints/organs
- should drink six-eight 8-ounce glasses of water daily for normal activity
- you can be dehydrated and not even be thirsty
- cold drinks (40-50ºF) leave the stomach more quickly than warm drinks; sugars slow down the rate at which fluids leave the stomach
- don’t worry about replacing the electrolytes lost during an aerobic class

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**Vitamins**
- *organic compounds* that are essential for the process of releasing energy from food
- help to control the growth, maintenance, and repair of body tissues
- can not be manufactured by the body, must be obtained from balance diet
- large doses of fat soluble vitamins can accumulate over time and cause serious toxic effects
- diet provides necessary vitamins; exception -- pregnant women, strict vegetarians, and individuals on low-calorie diets

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**Minerals**
- *inorganic compounds* that perform a variety of functions in the body
- calcium and phosphorous; supply strength and rigidity in body structures like bones and teeth
- iron is critical for the formation of hemoglobin; lack of causes fatigue
- balanced diet normally provides adequate amounts of minerals
- some minerals like calcium, magnesium and zinc must be taken together to ensure proper absorption and use in body
Antioxidants
- an organic substance that can “neutralize” particles called free radical without becoming a free radical itself
- reducing free radicals is believed to reduce/prevent the risk of cancer, heart disease and strokes
- Vitamins C, E, A; selenium (a mineral) and phytochemicals are antioxidants
- sweet potatoes, carrots, spinach, cantaloupe and mangos are great sources of antioxidants

Food Pyramid
- *KNOW all the SERVINGS and GROUPS of the Food Guide Pyramid*
- provides an general outline of what to eat each day -- designed by the U.S. Dept. of Health and Human Services

Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services, August 1992