Chapter 1: An Overview of Nutrition

Problems with the typical American diet:

- too much fat
- too much fast food and processed foods
- too much sugar
- too little fiber and unprocessed (whole) foods
- eating on an irregular schedule

Recommended dietary changes:

- eat less fat
- eat more fiber
- eat on a regular schedule

Making these simple dietary changes can be quite beneficial to one's health as they are related to:

    - weight maintenance
    - heart health
    - cancer prevention
    - diabetes management and/or prevention
- Chapter 18 will cover this concept in more detail

Eating for humans is physiologically necessary!

- The energy that food provides is necessary to fuel everything the body does
- The nutrients provided by food assist in many bodily processes
    - several of these nutrients are ***essential,*** meaning that it is essential to get them through dietary intake because the body cannot make them or cannot make enough to meet physiological needs. See more on the concept of essential nutrient in your textbook.

The Six Classes Of Nutrients

- Carbohydrate
- Fat
- Protein

Macronurients (Carb, Fat, Pro)

Micronurients (Vits, Mins)

- Vitamins
- Minerals
- Water

The amount of energy a food provides is measured in kilocalories (kcalories or kcals)

- Each of the energy nutrients provides kcalories for the body at the following rates:
    - Carbohydrate: 4 kcals/gm
    - Fat: 9 kcals/gm
    - Protein: 4 kcals/gm
- Your textbook has an additional, more technical, definition of kilocalorie, but you will not be responsible for it.
- Note that only carbohydrate, fat, and protein provide energy. Vitamins and minerals do NOT provide energy.

Recommended Balance of Energy Nutrients

- For the entire day, or for a single meal or food item, this proportion of the energy nutrients is suggested:
    - Carbohydrate: 45-65% of calories
    - Fat: 20-35% of calories
    - Protein: 10-35% of calories
- Meals that reflect this balance are those like spaghetti (pasta and tomato sauce -- a little meat thrown in) and stir-fry meals (rice and veggies with little strips of meat). See other examples of "The New American Plate" as presented by the American Institute for Cancer Research at their website (aicr.org).
- This is referred to as the Acceptable Macronutrient Distribution Ranges (AMDR)
    - We will refer to the above percentages again and again throughout the semester to evaluate healthy dietary intake or evaluate the health status of an individual food item
- On the other hand, a typical "combo" meal contains about:
    - 33% carbohydrate
    - 14% protein
    - **57% fat (!!!!)** ***** note AMDR for fat above**
- Go to the Web site for the Dietary Guidelines for Americans (healtheirus.gov/dietaryguidelines) for further recommendations on healthy dietary intake and suggestions for how to implement them.

More about each of the 6 classes of nutrients:

Carbohydrates

- Carbon, Hydrogen & Oxygen
    - sugars and starches (for example: Glucose $C_6H_{12}O_6$)
- Classifications
    - Simple: Monosaccharides (one sugar) and Disaccharides (two sugars)
        - sugars and fruits
    - Complex: Polysaccharides (many sugars)
        - starches and vegetables
- Function:
    - Supply energy (4 kcals per gram)
    - Glycogen: stored glucose (energy) in the liver and muscles
- Excess dietary intake: excess carbohydrates convert to *triglyceride* and are stored in the adipose tissue!

Fats (Lipids)

- Carbon, Hydrogen & Oxygen
- Most common type of lipid: Triglyceride (glycerol + 3 fatty acids)
    - butter, fatty meat, oils, mayonnaise
- Classifications:
    - Saturated: animal fats (solid)
        - fatty acids on these triglycerides are saturated (more on this concept in chapter 5)
        - the unhealthy type
    - Unsaturated: vegetable oils (liquid)
        - fatty acids on these triglycerides are unsaturated (more on this concept in chapter 5)
        - monounsaturated or polyunsaturated
- Functions:
    - supply energy (9 kcals per gram)
    - insulation, protection, transportation