

September 11, 2013

- Gasoline: average tax- 47 cents per gallon; 325\$ per year
  - North America accounts for 25% of the World Oil Energy
  - Recycled oil is just dirty, can be refined
  - U.S uses 350 billion gallons per day
  - Avg. person uses 100 gallons
  - Oil:
- o Carbohydrates
    - o All carbohydrates are composed of sugar units.
    - o 1 unit or many sugar units!
    - o Carbohydrates= 3 general classes
    - o Monosaccharide: ONE SUGAR (simple sugars)
      - Glucose (most common)
      - Fructose (sweetest)
      - Galactose
      - Water soluble: sweet taste
      - All of these are C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>
        - The difference is the shape of the molecules; different shape= different function
          - o Glucose- ring structure
          - o Fructose- collapsed ring structure
          - o Galactose- 5 Carbons with a 6<sup>th</sup> sticking off the
      - **Fructose:**
        - **High Fructose Corn Syrup**- very sweet, found in bread and pop.
          - o Increases glycemic index (more calories)
    - o Disaccharide: TWO SUGARS (sometimes called oligosaccharide- few)
      - Two monosaccharaides put together
        - Glucose + Glucose = Maltose
        - Glucose + Galactose = Lactose
        - Glucose + Fructose = Sucrose (table sugar)
          - o **All water soluble with a sweet taste!!**
        - OSE- some kind of carbohydrate!
    - o Polysaccharide: MANY SUGARS
      - **Starch**: All glucose- found in plants (AMYLOSE)
        - Starch molecules= little branching
      - **Glycogen**: All glucose- found in animals/ fungus
        - Glycogen molecules= highly branched
      - STORAGE COMPLEX CARBOHYDRATES
  - o You lose "water weight" at the start of a diet- TRUE; because you burn more glycogen for energy, glycogen has water surrounding it, when you burn it you excrete the water!!
    - Where do humans primarily store glycogen?
      - o In the liver and muscles

- **Cellulose:** All glucose- found in plants
  - STRUCTURAL POLYSACCHARIDE (strong)
  - Commonly called *fiber!*
  - Humans get NO nutritional value from Cellulose (no calories)
- WE CAN DIGEST GLYCOGEN BUT WE CAN'T DIGEST CELLULOSE, because the cellulose is not broken down, and goes right through you. The glycogen breaks down and stays in your body.

September 13, 2013

o Lipids

- o Hydrophobic: afraid of water; weak or no affinity for water
- o Hydrophilic: loves water; strong affinity for water
- o Characteristically greasy/oil substances!
- o Hydrophobic substances^
- o Lipid is a common term for:
  - Fats:
    - Stores energy!
    - 1 g of fat stores over 2x the energy as 1 g of a polysaccharide.
    - 1 pound of fat stores about 3500 calories
    - Humans store fat in their fat
      - o 70%- overweight to obese range
      - o 5%- overweight to obese range
      - o Diet- lose 1 pound per week
    - 2 basic components = Glycerol + Fatty Acids
    - \*Fatty Acid Molecules + Glycerol= Triglycerides
    - **Triglycerides-**
      - o Saturated:
        - No C-C double bonds in chain.
        - H fills all available C bonds. (Saturated with Hydrogen!)
        - Mostly animal fats
        - Solid at room temperature
          - Butter/ lard
      - o Unsaturated:
        - At least some C-C double bonds.
        - H does not fill all C bonds. (Unsaturated with Hydrogens!)
        - Mostly plant fats
        - Liquid at room temperature
          - Oils (peanut oil, vegetable oil)
        - 2 subtypes:

- Monounsaturated: one C to C double bond
- Polyunsaturated: many C to C double bonds

September 16, 2013

- Trans Fat- (across the double bond) (harder to break down than -cis isomers)\*
- **Essential fatty acids: they can't be manufactured by humans and must be obtained through the diet!**
  - o Omega 3
  - o Omega 6
- Phospholipids:
  - Hydrophilic (polar) head and hydrophobic (nonpolar) tail group
  - Biologically very important
  - Major component of cell membranes
  - One hydrophilic and one hydrophobic end
  - Membranes
    - o Composed of a double layer of phospholipids!
- Steroids: (Sterols)
  - Sterols all have a backbone of 4 Carbon rings
  - Cholesterol is the main type in animals!!!
    - o Cholesterol is from food and family (heredity)
  - **Cholesterol is modified to form estrogen, testosterone, and vitamin D**