

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period: \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_

1. **LIPIDS:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**:** butter, oil, Crisco, lard

Commonly called \_\_\_\_\_\_\_\_\_\_\_\_\_& \_\_\_\_\_\_\_\_\_\_

Contain \_\_\_\_\_\_\_\_\_\_C-H bonds and \_\_\_\_\_\_\_\_\_O atoms than\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

• Ex: C57H110O6

Nonpolar; therefore repels \_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

**Functions of lipids in our body:**

* + 1. \_\_\_\_\_\_\_\_\_\_\_\_\_energy storage (used when carbohydrates are NOT available)
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. \_\_\_\_\_\_\_\_\_\_\_\_\_body tissue (cushioning)

**WHICH HAS MORE ENERGY – LIPIDS OR CARBS?**

* + - One gram of \_\_\_\_\_\_\_\_\_contains \_\_\_\_\_\_\_\_\_\_\_\_\_\_as much \_\_\_\_\_\_\_\_\_\_as one gram of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Therefore, \_\_\_\_\_\_\_\_\_\_are better \_\_\_\_\_\_\_\_\_\_\_compounds!

**Fats vs. Carbs. & Energy Storage:**

* + - 1 gram of Carbs. (glycogen) = about **\_\_\_\_\_\_\_\_\_\_\_\_** of energy

o a short term rapid energy source (sprint events)

* + - 1 gram of Fats = about \_\_\_\_\_\_\_\_\_\_\_of energy

o a long term energy source (endurance events - marathons)

* + - Average human contains about 0.5 Kg of stored glycogen = \_\_\_\_\_\_ Kcal of energy.
    - About 16 Kg of body fat = \_\_\_\_\_\_\_\_\_\_\_ Kcal of energy

To carry the same amount of energy [144,000 Kcal] as carbs, we would have to store 36 Kg [79.4 pounds] more glycogen to lose 1 Kg of body fat.

This means you need to burn lots of calories!

**Types and Examples of Lipids:**

1.\_\_\_\_\_\_\_\_\_\_\_\_- steroids

2.\_\_\_\_\_\_\_\_\_\_\_\_\_– bee, furniture, ear, car

3. \_\_\_\_\_\_\_\_\_\_\_\_\_- in egg yolks, red meat

4.\_\_\_\_\_\_\_\_\_\_ - from animals

5. \_\_\_\_\_\_\_\_\_\_\_– from plants

6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - cell membranes

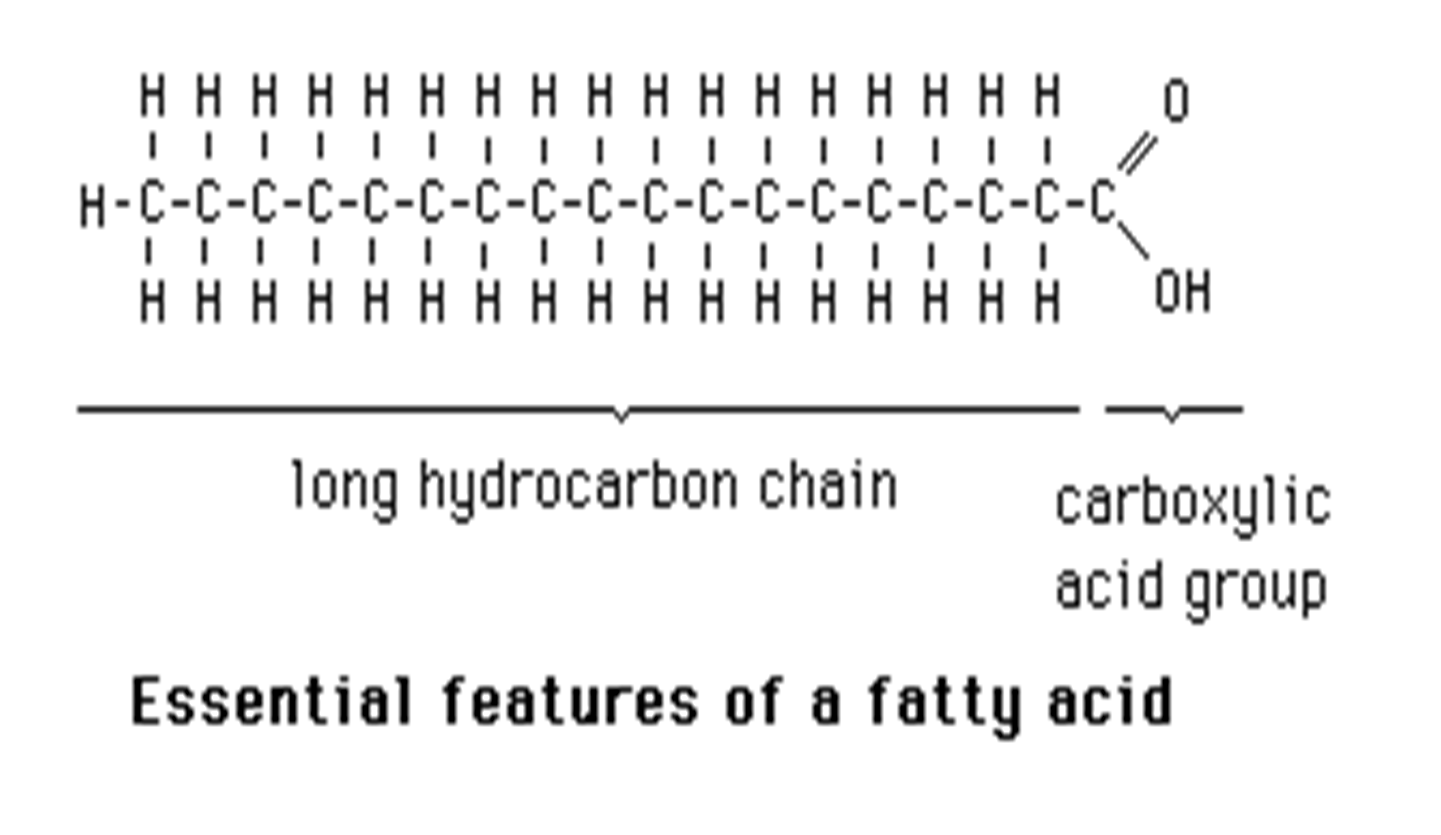
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - plants

**Structure of Lipids:**

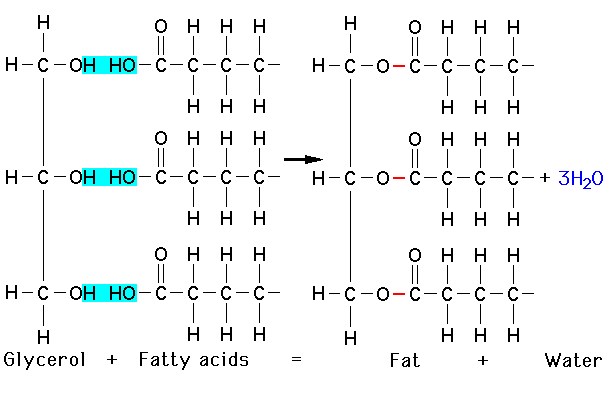
* + Basic building blocks: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Fatty Acids

o Long \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_with a \_\_\_\_\_\_\_\_\_\_\_group at one end

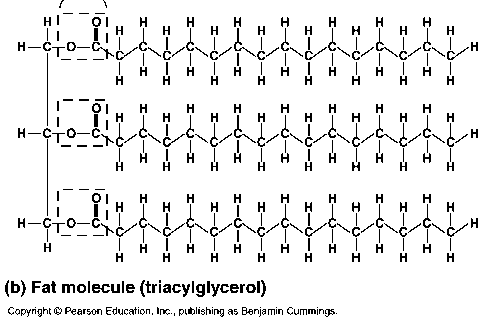
* One fatty acid

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* + Glycerol and each fatty acid chain are joined to each other by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



* + Structure of a lipid (1 glycerol + 3 fatty acids):



**3**

**Fatty Acids**

**Glycerol**

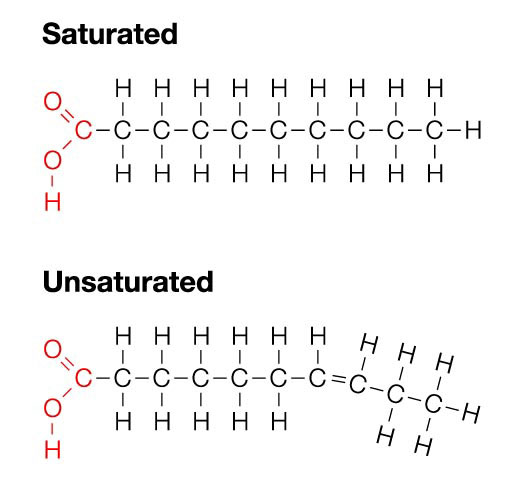
**4 types of fats:**

* + - 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = fatty acid chains of carbon with only \_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds between the carbon atoms

o “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”- cholesterol (heart disease)

o \_\_\_\_\_\_\_\_\_\_\_at room temperature

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_ , \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



* + - 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = fatty acid chains of carbon with

ONE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bond between the carbon atoms

o “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”

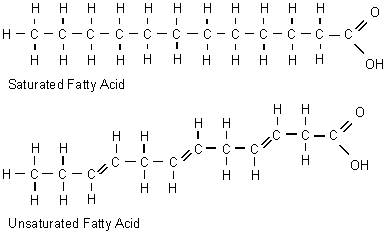
o \_\_\_\_\_\_\_\_\_\_\_\_\_\_at room temperature

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + - 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= more than one double bond between the carbon atoms in the chain

o Ex: nuts, seeds, fish, leafy greens

* + - * + Structural formulas for saturated and polyunsaturated fatty acids:



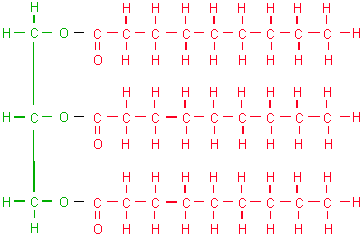
Polyunsaturated fatty acid

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (trans fat)

* + - Unsaturated fats that have been artificially saturated by addition of hydrogen atoms
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at room temperature
        + Margarine
        + Vegetable shortening

**What happens to LIPIDS in the body?**

* + - Broken down by the digestive system via HYDROLYSIS into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_which are then absorbed into the body through the bloodstream.
    - The fatty acids can then be broken down directly to get \_\_\_\_\_\_\_\_\_\_\_\_\_\_, or can be used to make glucose

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**=** Majority of fat in an organism consists of this type of fat molecules

* + - Derived from fats eaten in \_\_\_\_\_\_\_\_\_\_\_or made in the body from other energy sources like carbohydrates.
    - Calories ingested in a meal and not used immediately by tissues are converted to triglycerides and transported to fat cells to be stored.
    - Storage – 3 month supply of \_\_\_\_\_\_\_\_\_\_\_vs. glycogen’s 24 hour supply

• Hormones regulate the release of triglycerides from fat tissue so they

meet the body's needs for energy between meals.

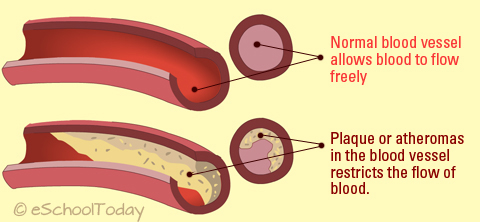
**Excess Triglycerides- Life Applications:**

* + - Cause plaque to build up

o \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = walls of the arteries get thick and hard; fat

builds up inside the walls and slows the blood flow

Cause blood clots –heart attacks, strokes

* + - *  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(high blood pressure)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (part of cell membrane structure)

