Lipids

* Lipids are a major source of energy used by cells, however lipids are more difficult for your body to break down. They produce nearly twice the amount of energy than proteins or carbohydrates.
* Lipids are essential in our diets as they:
  + Are useful as insulation,
  + Are necessary components of cell membranes,
  + help absorb vitamins,
  + are even useful in hormone production.
* Lipids are used to store and excess energy from extra carbohydrates in animals
* Lipids are made up of Carbon, Hydrogen, and Oxygen in different proportions than in carbohydrates

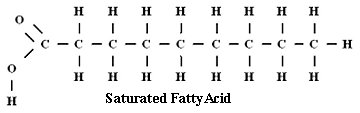
**There are three groups of Lipids:**

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| --- | --- |
| Groups | Structure |
| 1. **Triglycerides**  * Most common type of Lipid. * Made up of one ***glycerol*** molecule and three ***fatty acids*** linked together by a **dehydration synthesis** | http://www.biology.iupui.edu/biocourses/n100/images/3triglyceride.gif |

**Saturated Fats vs. Unsaturated Fats**

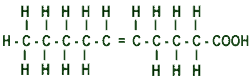
**Saturated fats**

* + Contain as many hydrogen atoms as possible with single bonds between the Carbon atoms
  + Common in animals.
  + Difficult to digest.
  + In general, the greater number of hydrogen atoms, the firmer the fat.



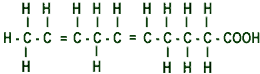
**Unsaturated fats**

* + - Some hydrogen atoms are missing due to the double bonds present in the molecule.
    - Commonly found in plants and are in the oil variety. (*canola oil, olive oil, sunflower oil, etc.)*
    - **Mono-unsaturated** fats:
      * Considered to be the healthiest type of fat. Believed to lower cholesterol and may assist in reducing heart disease.
      * Ex. Olive oils, nuts, seeds. Commonly found in plants.



*Monsatruated fatty acid*

* + - **Poly-unsaturated** fats:
      * Found in vegetable oils like soybean, corn, sunflower and safflower. They also occur in oily fish.
      * Look for Omega-3 fatty acids (EFA’s).



*Polyunsaturated fatty acid*

Double bonds react more easily, which means the double bonds of the unsaturated fats are more easily broken down for the cells of your body.

***But what are Trans fats?***

* + - Unsaturated fats in foods make it more likely to spoil, so scientists found a way to add hydrogen to these fats, creating hydrogenated fats, or **Trans fatty acids.**
    - Trans fats tend to raise total blood LDL cholesterol levels.
      * **Example**: Margarine made of olive oils (BECEL)

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| --- | --- |
| Groups | Structure |
| 1. **Phospholipids**  * One of the **fatty acid** chains is replaced by a **phosphate group**. * This forms a polar end that is water soluble. * This molecule has one end that is water soluble, and one end that is soluble in oils and grease. | http://www.uic.edu/classes/bios/bios100/lecturesf04am/phospholipid.jpg |
| 1. **Steroids(Cholesterol)**  * Structurally different from triglycerides and phospholipids * Material need to synthesis other steroids such as vitamin D, testosterone, and estrogen. | http://www.raw-milk-facts.com/images/Cholesterol2.gif |