

LIPIDS

- Lipids are Heterogenous group of substances of biological origin related to fatty acids include fats, oils, waxes and other related substances.

Lipids are a class of biological molecules defined by low solubility in water and high solubility in nonpolar solvents.

As molecules that are largely hydrocarbon in nature, lipids represent highly reduced forms of carbon and, upon oxidation in metabolism, yield large amounts of energy. Lipids are thus the molecules of choice for metabolic energy storage.

Biological functions

- The most important role of lipids is as a fuel. Thus fat is the most concentrated form in which potential energy can be stored.
- Since fat is a bad conductor of heat, it provides excellent insulation.
- Fat may also provide padding to protect the internal organs.
- Some compounds derived from lipids are important building blocks of biologically active materials.
- Lipoproteins are constituents of cell walls.
- One more important function of dietary lipids is that of supplying the so-called essential fatty acids

Functions of lipids

- Lipids are concentrated source of energy. One gram fat gives 9 K calories.
- It serves as a cushion for the vital organs and protects them from external shocks or injuries.
- Lipids are the structural materials of cells and membranes
- Lipids serves as insulator for our body
- Lipids are the carrier / reservoir of fat soluble vitamins
- In food preparations lipids serves as a binding agent. It also enhances the palatability of foods

Classification

Simple Lipids:

They are esters of fatty acids with various alcohols eg. fats, oils, waxes, steroids.

Complex/Compound Lipids:

Lipids which remain linked with non lipid molecules such as proteins, oligosaccharides and phosphates eg. phospholipids, lipoproteins, glycolipids.

Derived lipids:

Formed from simple and compound lipids
Eg. hormones, fat-solubility vitamins

Fatty acids

– are saponifiable lipid building blocks.

Fatty acids are naturally occurring carboxylic acids with an unbranched carbon chain and an even number of carbon atoms.

The pathway by which fatty acids are biosynthesized they almost always contain an even number of carbon atoms.

Long-chain fatty acids (12 to 26 carbon atoms) are found in meats and fish; medium-chain fatty acids (6 to 10 carbon atoms) and short-chain fatty acids (fewer than 6 carbon atoms) occur primarily in dairy products.

There are saturated and unsaturated Fatty acids.

Fatty Acids

- Linear Molecules 10-20 carbons in length
- Even number of carbons
- No other functional groups but carboxyl
- Sometimes alkene groups $C=C$
 - Saturated vs. unsaturated