



LIPIDS



CHEMICAL COMPOSITION

- Lipids are composed of the elements C, H , & O
- Examples: fats, oils, waxes, steroids (estrogen, progesterone, testosterone), cholesterol, aldosterone, glycolipids, and phospholipids



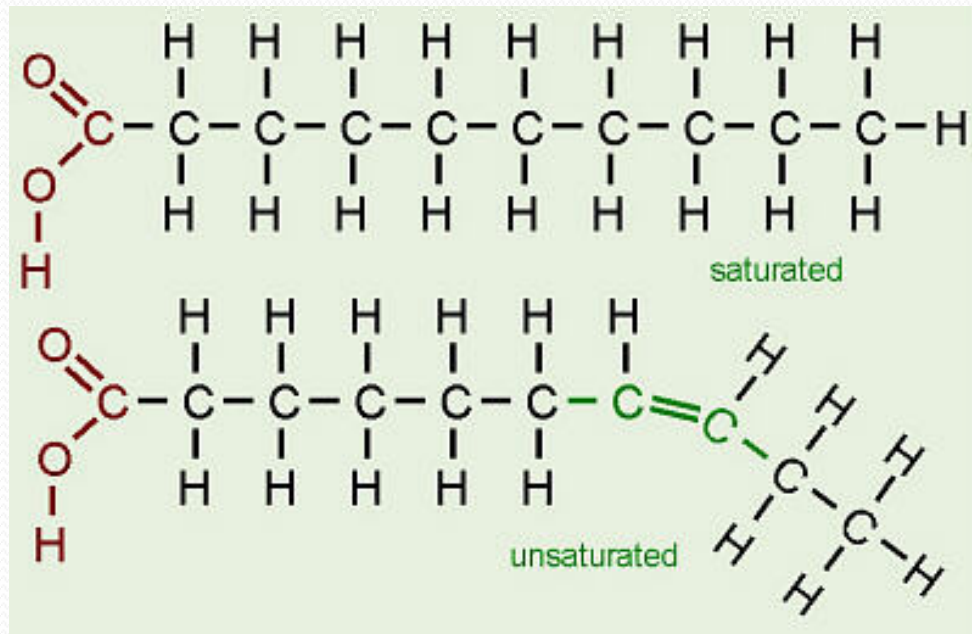
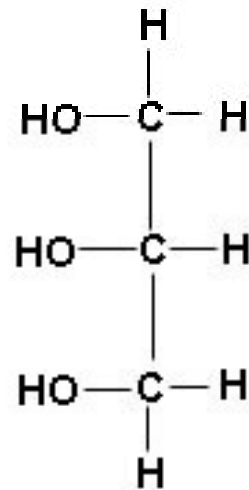
FUNCTIONS of neutral fats

- Neutral fats (fats & oils) are long term storage compounds stored in adipose tissue. They provide insulation (prevent heat loss) and protect internal organs.
- Composed of C, H, O
- Fats and oils are called neutral fats because they are non-polar molecules & do not dissolve in water

Neutral Fats

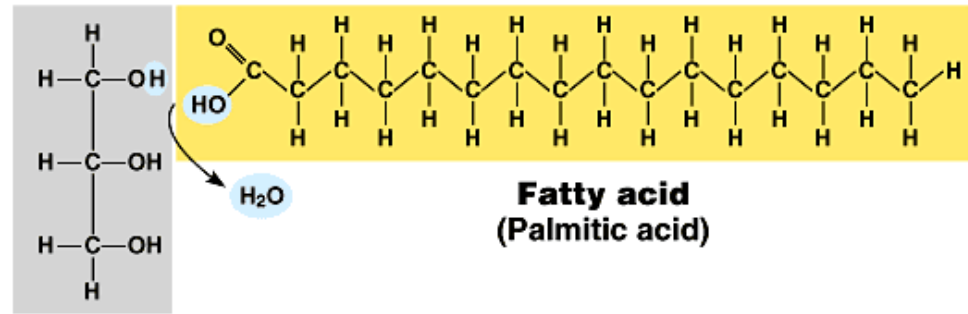
- Monomers = 1 glycerol plus 3 fatty acids

GLYCEROL

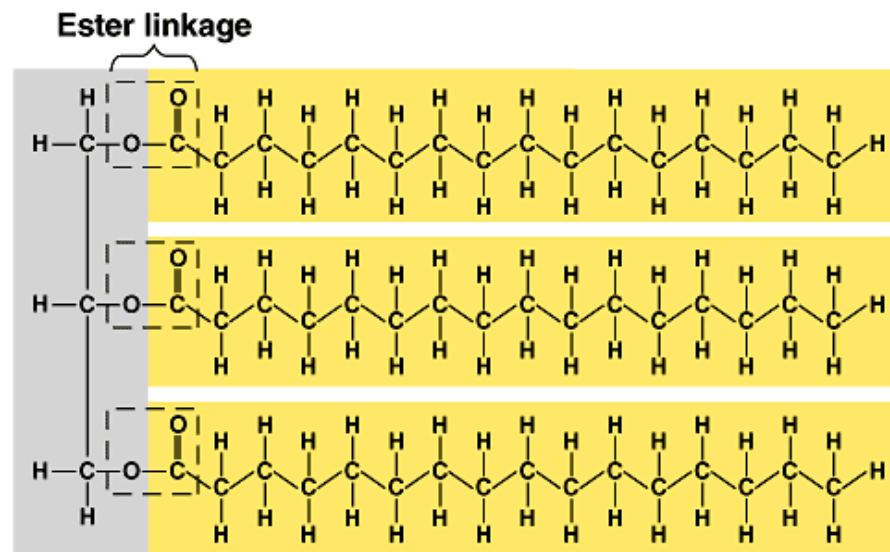


Formation of lipid polymers

- Lipid polymers form by dehydration synthesis (lose water)
- Lipid polymers are broken down by hydrolysis (add water)



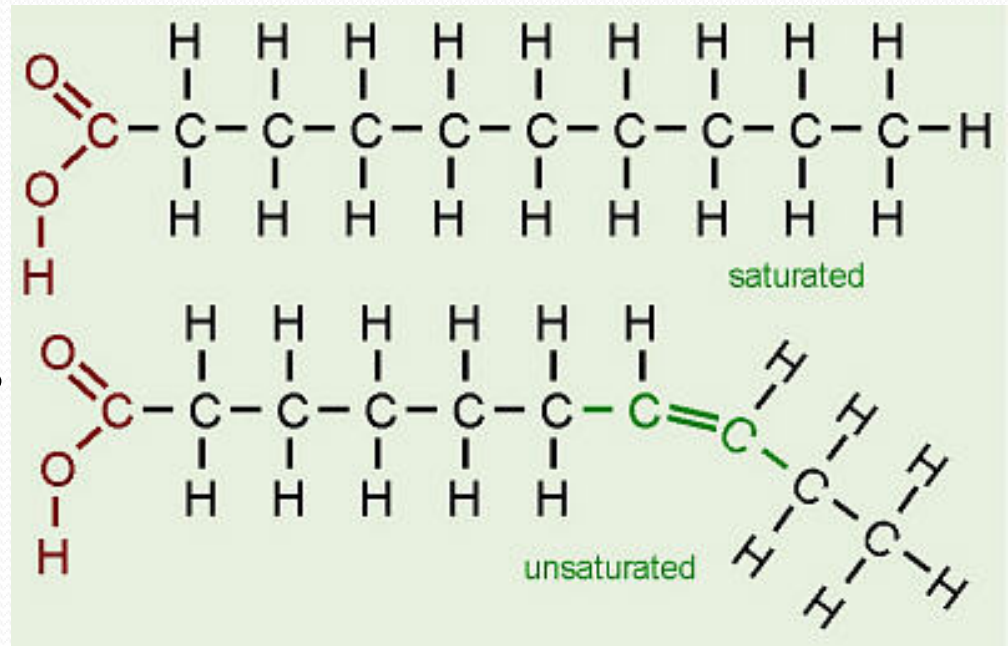
(a) Dehydration synthesis



(b) Fat molecule (triacylglycerol)

Saturated vs. Unsaturated

- Saturated fatty acids contain single bonds between the carbons – they are saturated with hydrogen (eg butter)
- Unsaturated fatty acids contain one or more double bond between the carbons (eg vegetable oils)





Phospholipids

- Structural component of the cell membrane
- Help to regulate movement of molecules in and out of the cell
- Provides fluidity to the cell membrane
- Composed of C, H, O, phosphate group, N



Steroids

- Many steroids are hormones
- Estrogen and progesterone (produced in the ovaries) and testosterone (produced in the testes) maintain sex characteristics
- Aldosterone produced in the adrenal glands regulate Na^+/K^+ in the kidneys
- Cholesterol provides stability to cell membranes
- Bile (a modified cholesterol) breaks down neutral fats into fat droplets

Steroids

- Contain a backbone of 4 fused C-H rings with different atoms attached to the rings

