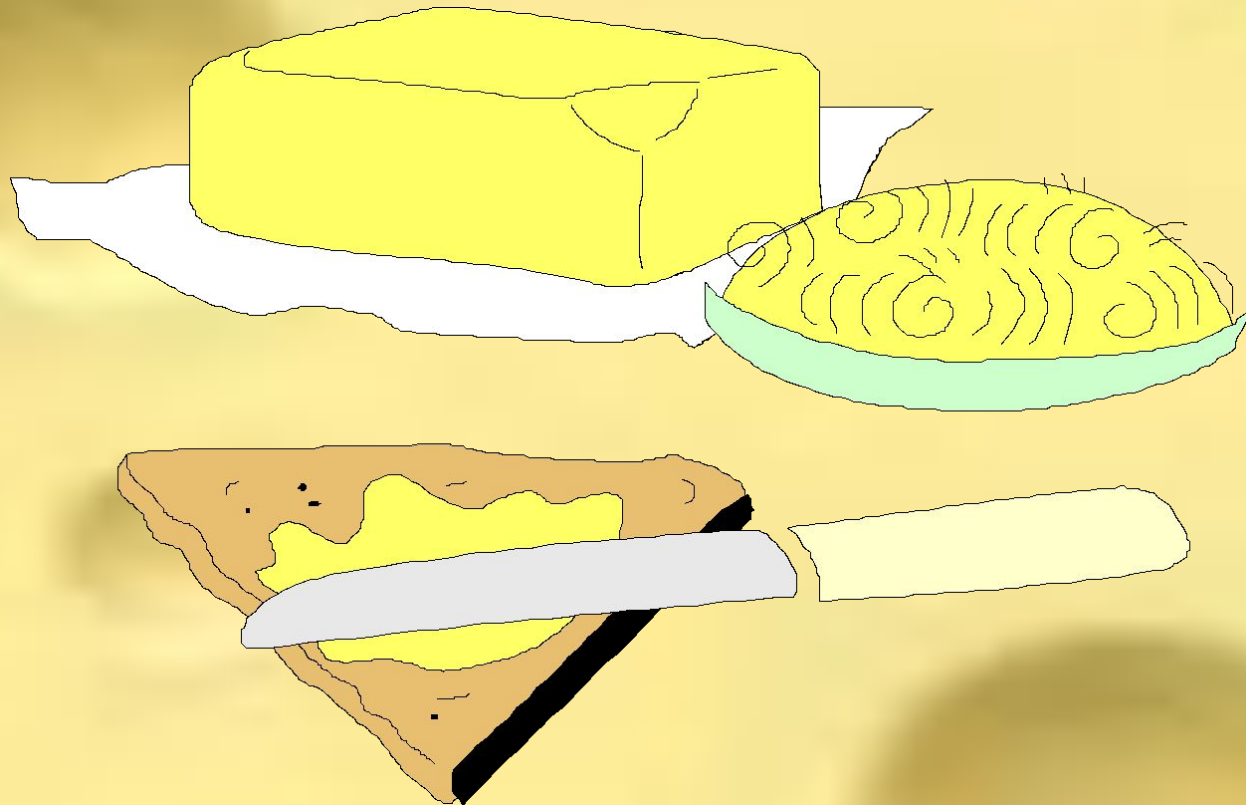
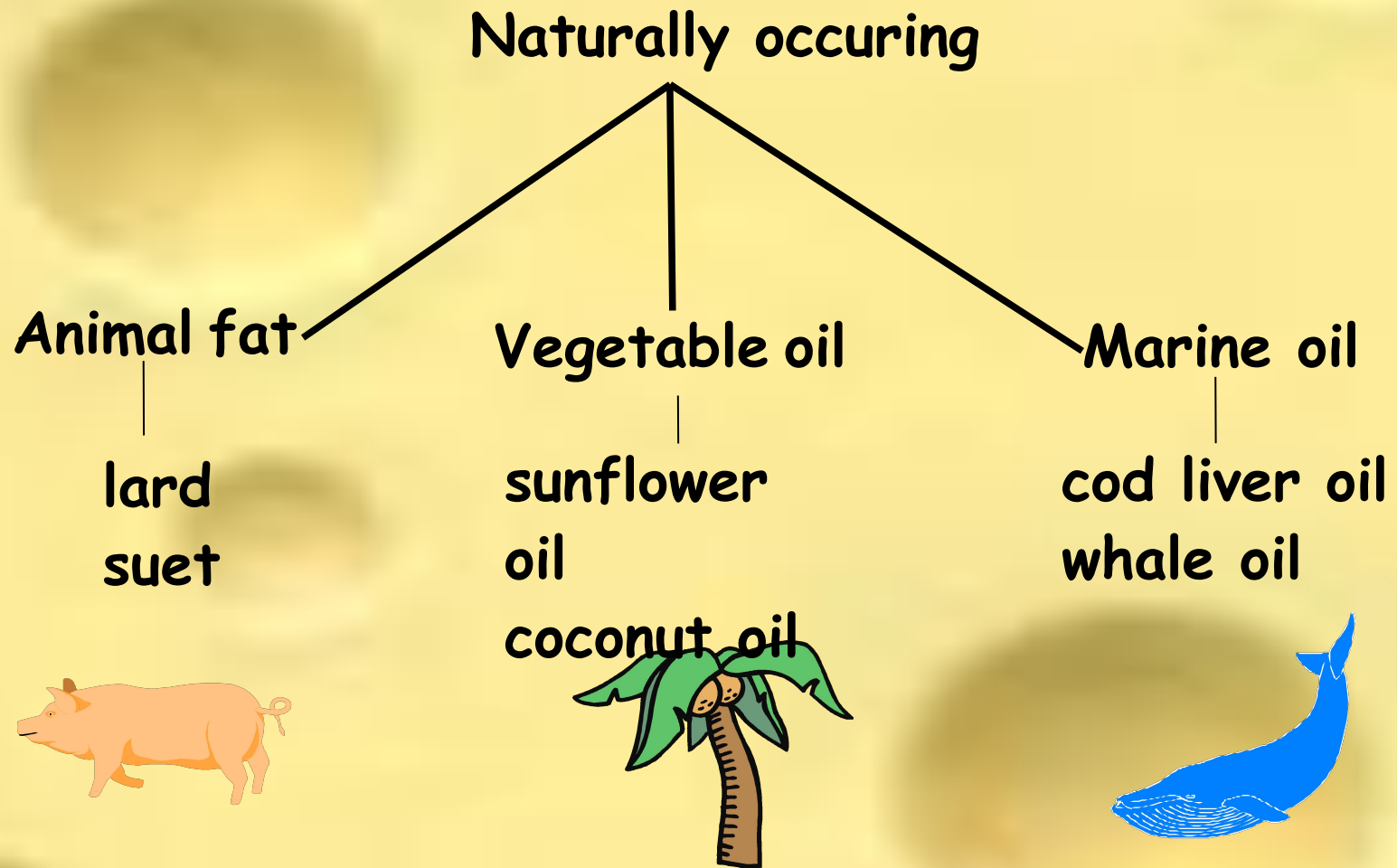


Fats and oils

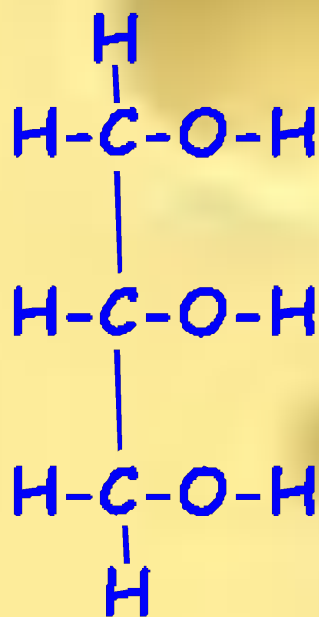


Fats and oils

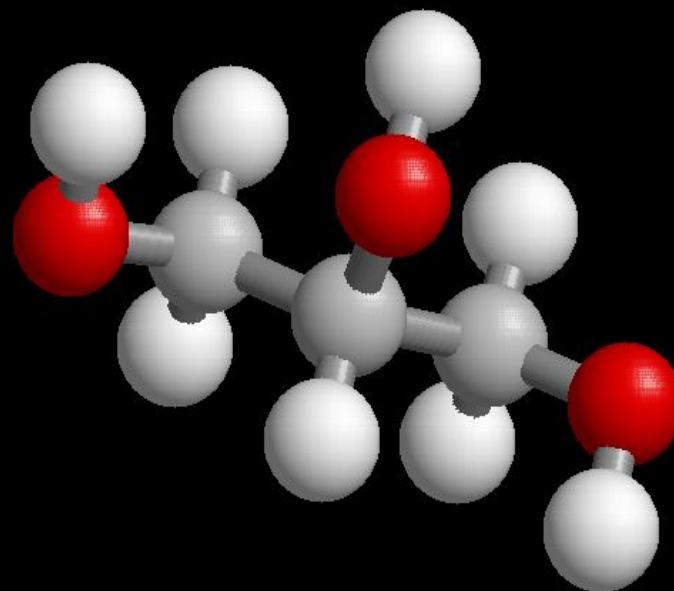


Fats and oils

Fats and oils are built from an alcohol with three -O-H groups.



glycero
1

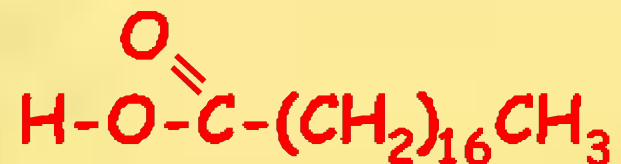


Systematic name is propane-1,2,3-triol

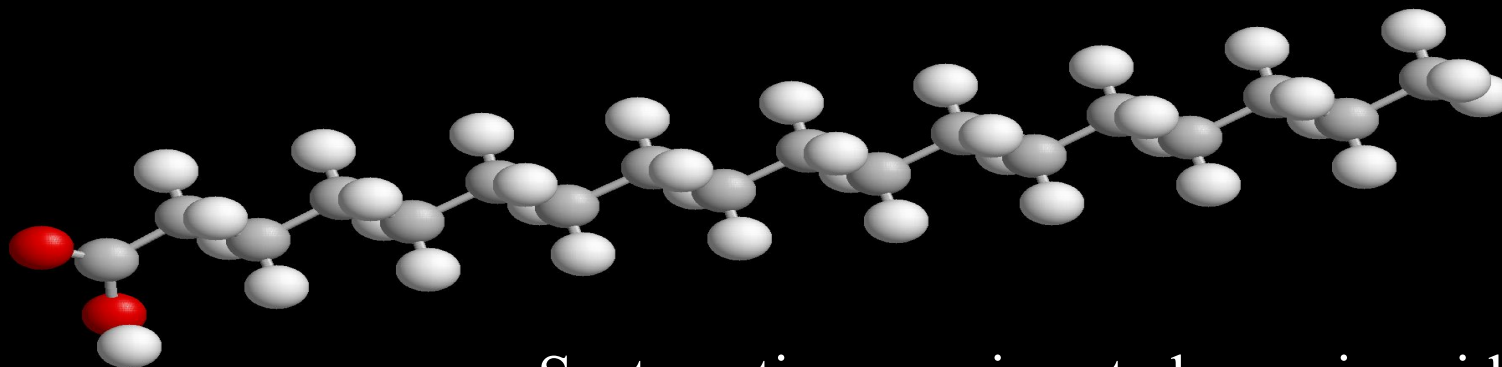
Fats and oils

The other components of fat molecules are carboxylic acids

such as



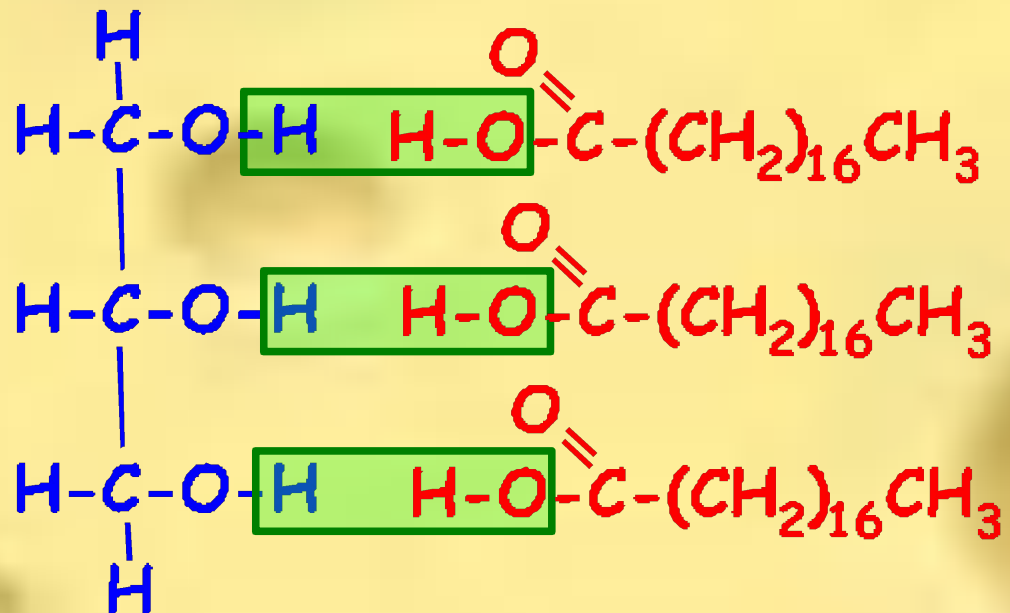
Stearic acid



Systematic name is octadecanoic acid

Fats and oils

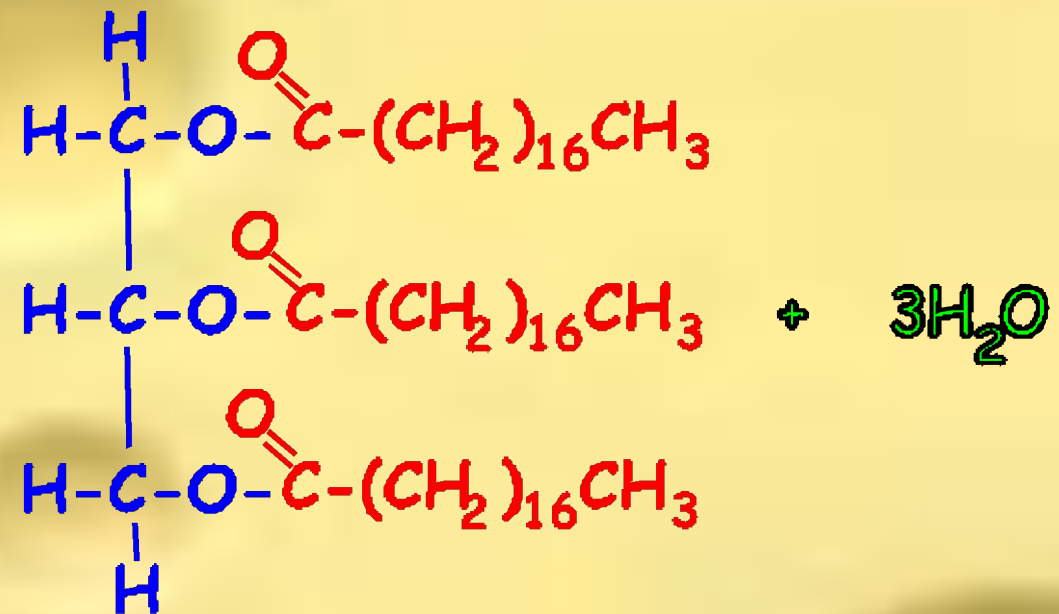
Fats and oils are ESTERS of
glycerol and
long chain carboxylic acids



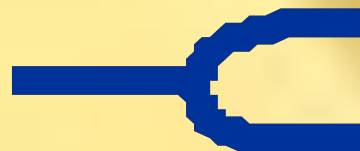
Fats and oils

Removal of water in the condensation reaction gives

-

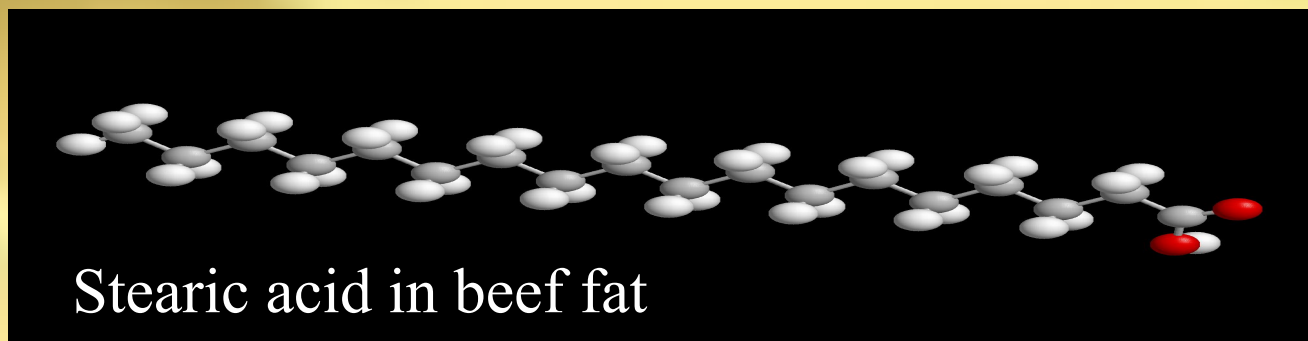


The molecular formula shown above suggests that the fat molecule is shaped like an E, but the molecule is actually shaped more like this:

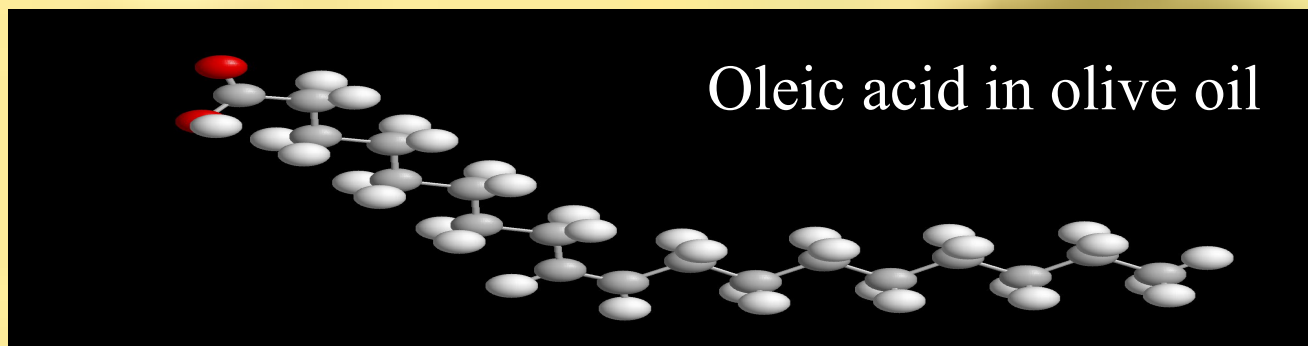


Fats and oils

Fats are mainly built from carboxylic acids with $C-C$ single bonds.

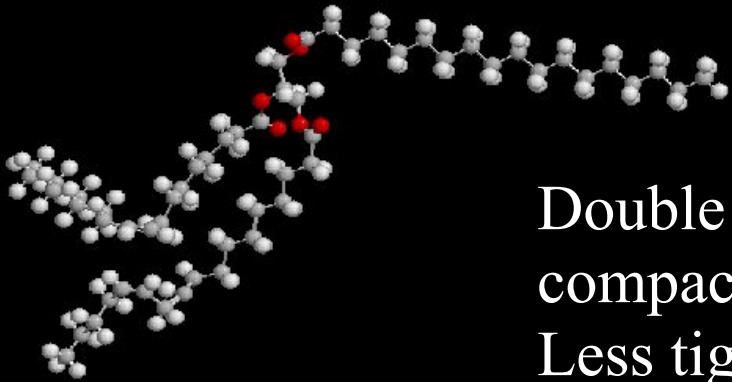


Oils have some $C=C$ bonds in the carboxylic acids from which they are made.



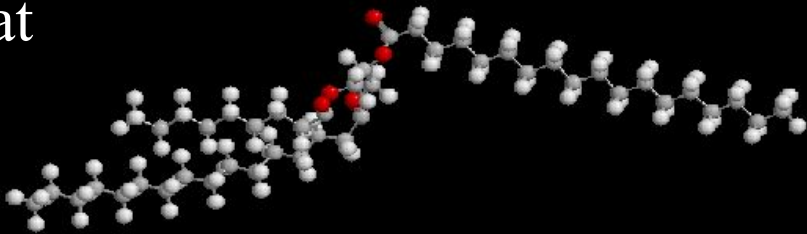
Fats and oils

Oil



Double bonds in oil make the molecule less compact.
Less tightly packed molecules make oils liquid.

Fat



Fat molecules pack together more tightly,
making fats solid at room temperature.

References

Prepared by Malcolm Stephen
of Mackie Academy, Stonehaven, Kincardineshire

He used free software called 'RasTop' to draw the ball and stick molecular images.

This software can also be used to produce pdb files, interactive visualisations of the molecules.

Web sites (checked 17/07/03):

RasTop www.geneinfinity.org/rastop/

RasMol home page <http://openrasmol.org/>

An internet search for 'rasmol' or 'chime' will identify many potential sources of interactive molecular images.