SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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Approved by AICTE , New Delhi and Affiliated to Anna University , Chennai.

DEPARTMENT OF FOOD TECHNOLOGY

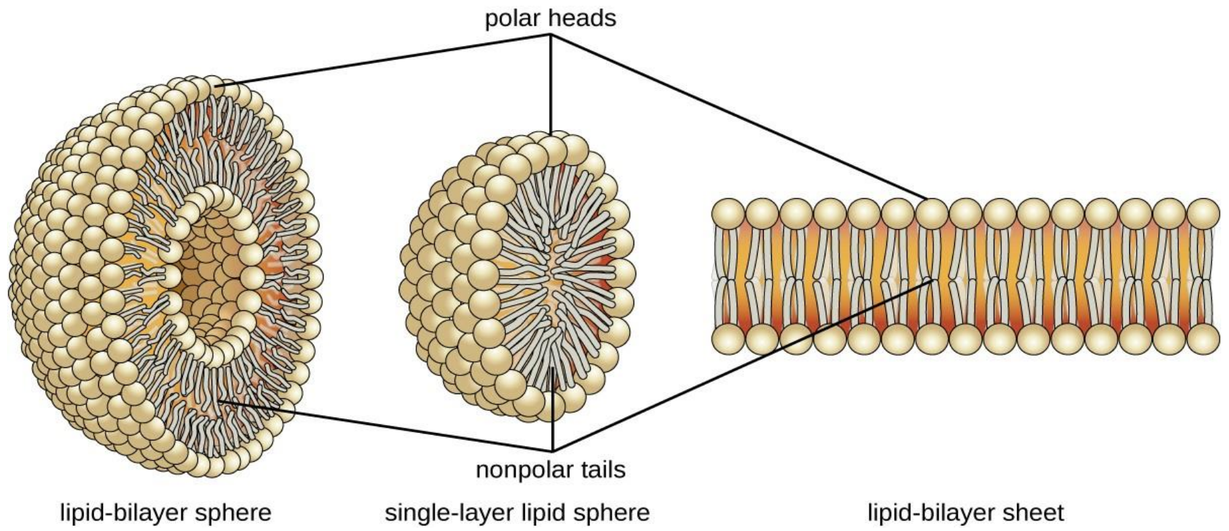
19FTO302 FOOD NUTRITION

III– YEAR VI SEMESTER

UNIT III –LIPID
TOPICS- CLASSIFICATION OF LIPID

DEFENITON

Lipids may be regarded as organic substances relatively insoluble in water, soluble in organic solvents, potentially related to fatty acids and utilized by the living cells.



FUNCTION OF LIPID

- They serve as a storage form of metabolic fuel. (fatty acid, Triacyglycerol).
- They serve as a transport form of metabolic fuel.(free fatty acid, triglyceride and cholesterol ester) .
- They provide the structural components of membranes(phospholipids, glycolipids, galactolipids, sphingolipids)

CLASSIFICATION OF LIPID:

Simple lipids or homo lipids:

These are esters of fatty acid with various alcohol group

Compound lipids or hetero lipids:

These are esters of fatty acid with various alcohol group and posses as additional group

Derived lipids:

These are the substance derived from simple and compound lipids by hydrolysis

SIMPLE LIPIDS:-

Esters of fatty acids with glycerol.

Mainly of two types:-

i. Fats and oils: -These are esters of fatty acids and glycerol. -difference b/w fats and oils is physical.

ii. Waxes : -Esters of fatty acids+alcohol other than glycerol. -Cetyl alcohol is most commonly used

COMPLEX OR COMPOUND LIPIDS:-

- Esters of fatty acids+Alcohol+other groups like phosphate,Nitrogenous base,carbohydrate ,Protein,etc.
- Based on the group present they are further classified into:-

i. PHOSPHOLIPIDS:- • F.A+Alcohol+phosphoric acid as nitrogenous base. • Based on the type of alcohol present they are again divided into

- Glycerphospholipids:Contain Glycerol as alcohol. Eg:lecithin &cephalin
- Sphingophospholipids : Contain sphingosine as alcohol. Eg: sphingomyelin

ii.GLYCOLIPIDS:-

• Fatty acids+alcohol+carbohydrate as nitrogenous base.

• They contain sphingosine as alcohol and hence also known as GLYCOSPHINGOLIPIDS. • Eg: Cerebrosides and Gangliosides.

iii.LIPOPROTEINS:-

• Macromolecular complexes of lipids with proteins.

• Eg:LDL,VLDL,Chylomicrons,HDL,etc

iv. Other complex lipids:-

• Sulfolipids,Aminolipids and other Lipopolysaccharides come under this.

DERIVED LIPIDS:-

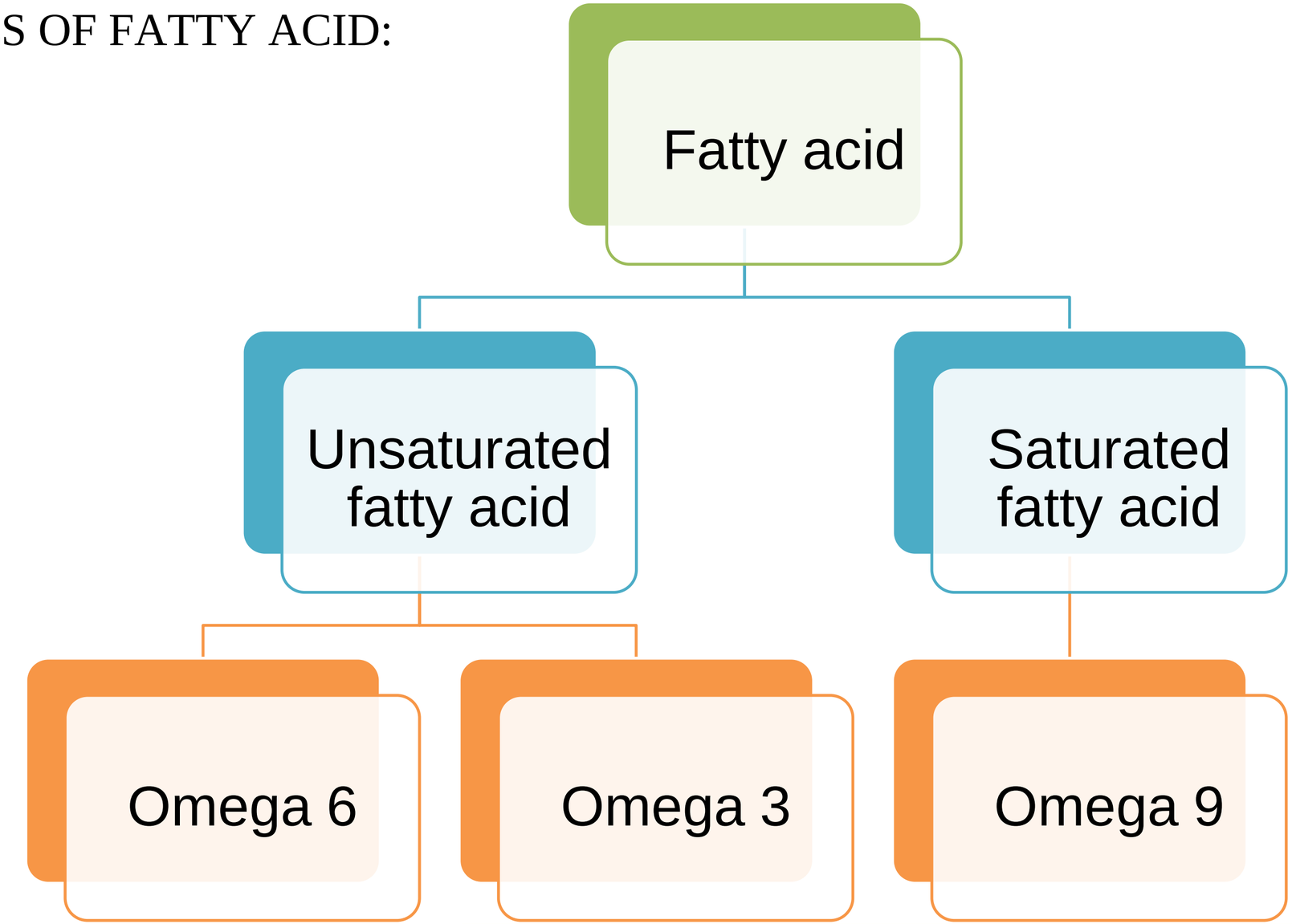
 These are the derivatives of hydrolysis of simple and complex lipids which possess the characteristics of lipids.

 These include: • Lipid soluble vitamins • Steroid hormones • Hydrocarbons • Ketone bodies • Mono and diacylglycerol ,etc

FATTY ACIDS

- Carboxylic aicds with hydrocarbon side chains.
- Occur in esterified form
- They occur in even and odd carbon forms
- Saturated and unsaturated.
- Essential and non essential fatty acids.

TYPES OF FATTY ACID:



SATURATED FATTY ACIDS:

 Saturated fatty acids have no double bonds in the chain or contain single chain.

 Their general formula is CH3-(CH2)n-COOH, where n specifies the number of methylene groups between the methyl and carboxyl carbons. They have higher melting points

 They are solid at room temperature.

 Examples- lauric, myristic, palmitic acid etc.

UNSATURATED FATTY ACIDS

- These fatty acid contain one or more double bonds along the length of the hydrocarbon chain.
- They are liquid at room temperature.
- Have low melting point.
- The commonly used system for designating the position of double bond in unsaturated fatty acid is the delta(Δ) numbering system.

- Example- linoleic acid, oleic acid, palmitoleic acid.
- In the naturally occurring unsaturated fatty acid the double bond are in cis configuration and trans fatty acid are produced by fermentation in the rumen of dairy animals and are obtained from dairy products and meat.

• Monounsaturated fatty acid :-

 They contain only one double bond per fatty acid.

 The double bond is between C-9 and C-10(Δ9)

•Polyunsaturated fatty acid or PUFAs:-

 They contain two or more double bonds along the length of the hydrocarbon chains.

 PUFAs are also known as essential fatty acid.

 Examples- linoleic and linolenic acid

THANK YOU