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**Bs HND 2nd semester**

**.Question no 1**

**.DEFINE THE FOLLOWING**

**.BILE ACIDS**

Bile acid are cholic acid cheno deoxycholic acid

They are synthesized from cholesterol in liver

The bile acid are activated by ATP+ co- enzyme –A ,and conjugated with aminoacid ,glycine or taturine

Glycine forms an amide linkage with the bile acids and becomes glycocholic acid or glycol chen odeoxycholic acid

Tarurine also forms an amide linkage with bile acids and become taurocholic acid or taurochenodeoxycholic acid

.**IODINE NUMBER**

The number of grams of iodine ,which is required to saturate the double bonds present in 100g of fat

It is often used to determine the amount of unsaturated in fatty acids

This unsaturated is in the form of double bond which react with iodine compounds

**.HYDROGENATION OF OIL**

A chemical process by which hydrogen are added to monounsaturated or polyunsaturated fat to reduce the number of double bonds making the fat more saturated and more resistant to oxidation (protecting against rancidity)

Once hydrogenated the unsaturated fatty acids (in oils) become saturated fatty acids

Hydrogenation produce trans fatty acid

By this process the liquid fats that is oils are converted to solid fats i-e ghee …

**.LECITHINS**

The best known phospholid is lecithin , a compound of glycerol to which are attached two fatty acids , a phosphate group and a choline molecule

These GPLs are derivatives of alpha phosphatidic acid in which ,choline is joined with H3PO4

Choline is strongly basic like NaOH

There are many types of lecithins depending upon the type of fatty acid

These are most abundant of the phospho-lipids in serum and bile

They are good emulsifying agents for fats

They are important constituents of lungs surfactant

**.TRIGLYCERIDE**

Triglyceride are compose of carbon ,hydrogen and oxygen .they have many more carbons and hydrogen in portion to their oxygen so it can provide more energy per gram

Every triglyceride contain one molecule of glycerol and three fatty acids . fatty acids may be 2 to 24 carbon long ,the 18 carbon ones being the most common

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**QUESTION NO 2**

**What are lipids ? what is the different between fats and waxes / what is the importance of lipids in our body**

**.LIPIDS**

Lipids are organic compounds made up of fatty acids alcohols and may contain other compounds

They are not soluble in polar solvent (water) but not soluble in non polar solvents (fat solvent ) like ether , chloroform ,benzene ,acetone etc

They are lighter than water i-e they have lower density than water

They leave greasy marks on paper

They include triglyceride , cholesterol ,bile salts , steroids hormones (derived from cholesterol ) , fat –soluble vitamin

DIFFERENCE BETWEEN FATS AND WAXES

Fats are esters of fatty acids with glycerol, and are solid at, room temperature. On the other hand, waxes are esters of fatty acids other than glycerol. They contain one mole of long chain fatty acid esterified with one mole of high molecular weight monohydroxy alcohol.

IMPORTANCE OF LIPID

They are good emulsifying agents

Ketone bodies act as a reserve fuel

Lipids under the skin prevent excessive loss of water and electrolytes

They help in transportation of fat -soluble vitamins and other fat- soluble compound across cell membrane

Energy Storage.

One of the main functions lipids do is storing energy. If a person eats excessive amount of food, lipids help store the energy in the form of fat molecules in the body to use later.

Cell structures

Lipids are present in every cell of the human body and are the main part of the cellular membrane. It prevents the cells from being leaky by surrounding them the perfect way.

Hormones

Lipids are also essential for the human body as they are a part of many hormones. They play a major role in regulating your growth and how your body works on a daily basis. The hormones of wDigestion

Lipids also play an important part in the digestion of food. It is used to make bile acids n the stomach which is essential for dissolving fat from the food you eat. This is essential for the process of normal digestion of food and the absorption of fat soluble vitamins. They are also essential for the transportation of fatty acids in the body

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Insulation and Protection

Lipids are needed to protect and insulate your body. To keep your internal body temperature regular, there is a layer of fats just beneath the skin that is made from lipids. Similarly, there is a layer of fats also around your vital organs that keeps them protected from injuries.

Lipids are the building blocks of cells in your body. Therefore, it is important to ensure your body has the right amount of them to keep it functioning perfectly.

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**QUESTION NO # 3**

**What are prostaglandins PGs and what are their function ?**

PGs and the related compounds i-e thromboxanes (TX) and leukotrienes (LTs) are hormone like substances and are collectively termed as eicosanoids

They are formed from a 20 carbon unsaturated FA known as prostanoic acid which is derivative of arachidone acid

PGs differ from the hormones in that they are formed in almost all tissues rather than in specialized glands and they generally act locally rather than after transport in the blood to distant sites of action

PGs have been detected in all every mammalian tissue and body fluid

They are produce in minutes amount and they have broad spectrum of activity and diverse biological effects

PGs are converted to inactive from at the site of their production

They are not stored to any appreciable amount

**Functions of prostaglandins**

Regulate menstruation and fertility

Control inflammation

Vasodilatation / vasoconstriction

Lower blood pressure

Induce blood clotting

prevent blood clotting

platelet aggregation

CLINICAL IMPORTANCE

Prostaglandins can be used in the following condition

Induction of labor

Infertility nasal congestion

Peptic ulcers

gastric hyperacidity

edema

anaphylactic shock

bronchial asthma

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**QUESTION NO 4**

**What is fatty acid and its classification ?**

**FATTY ACIDS**

A fatty acids is an organic acid a chain of carbon atom with hydrogen attached that hasan acid group (COOH) at one and a methyl group at the other end . Fatty acid, important component of lipids (fat-soluble components of living cells) in plants, animals, and microorganisms. Generally, a fatty acid consists of a straight chain of an even number of carbon atoms, with hydrogen atoms along the length of the chain and at one end of the chain and a carboxyl group (―COOH) at the other end. It is that carboxyl group that makes it an acid (carboxylic acid). If the carbon-to-carbon bonds are all single, the acid is saturated; if any of the bonds is double or triple, the acid is unsaturated and is more reactive. A few fatty acids have branched chains; others contain ring structures (e.g., prostaglandins). Fatty acids are not found in a free state in nature; commonly they exist in combination with glycerol (an alcohol) in the form of triglyceride.

CLASSIFICATION OF FATTY ACIDS

Saturated fatty acids

Unsaturated fatty acid

**Saturated fatty acid**

These fatty acids do not contain double bonds eg butyric acid , caproic acid ,palmitic acid , stearic acid ,arachidic acid

The saturated fatty acids having less than eight carbon atoms are liquid at room temperature are volatile

**Unsaturated fatty acid**

these fatty acids contain double bonds

unsaturated fatty acids are further classified according to the degree of their of their unsaturated i-e monounsaturated and polyunsaturated fatty acids

**MONOUNSATURATED FATTY ACIDS**

Contain only one double bond eg oleic acid found in nearly all fats

**POLYUNSATURATED FATTY ACIDS**

These contain more than one double bond

Three polyunsaturated fatty acid have biological importance ie linoleic acid ,linolenic acid and arachidonic acid

Polyunsaturated fatty acid which are not synthesized in the body are essential fatty acids and there fore should be taken in the diet

Oils contain significant quantity of poly unsaturated fatty acids eg oils from corn ,wheat germ , peanut ,soya bean etc

**QUESTION No 5**

Write short note on following

**LIPOPROTEIN**

These are compound lipids lipoprotein are made up of neutral lipid core (containing TAG or cholesteryl esters or both ) surrounded by a shell of apolipopriteins , phospholipid and non esterified cholesterol . all are polar – oriented so that polar protein are exposed on surface of lipoprotein thus making the particle water- soluble . lipoprotein transport lipid in blood . the major composition of it is cholesterol phospholipid , purified protein and TAG.lipoprotein are of five types i-e chylomicrons very low density lipoprotein VLDL, intermediate density lipoprotein IDL , low density lipoprotein LDL , high density lipoprotein

**CHOLESTEROL**

Cholesterol is the most famous sterol ,It is the most abundant animal sterol , rich sources are adrenal cortex , brain , nerve tissue and egg yolk human body can synthesis about 3 gm of cholesterol per day . liver plays a central role in the regulation of the body cholesterol balance normal blood cholesterol level is 200mg per dl variation in cholesterol level is very indicator of cardiac and vascular diseases it is an important structure component of cell membranes it is not flexible hence contributes to the rigidity of cell membranes

THE END ……………………………………………………………………..