VITAMINS

INTRODUCTION:——> Vitamins are Complex organic substances present in different types of foods and are essential for specific metabolic reaction within the cells. It is present in animals bacteria and micro organisms for maintance and normal growth of life. They play an important role in several energy generating mechanism of a body.

The vitamins was discovered by a Funk in 1912 and considered it as an accessory food factors responsible to present Beri - Beri and ~~Sco~~ scurvy etc.

CLASSIFICATION:——> The vitamins are generally divided in two groups.

(1) Fat saluble vitamins
(2) Water saluble vitamins.

The Fat saluble vitamins:——> The includes vitamins A, D, E and K.

(a) **Vitamin A ——>** It was discovered by Mc Callum and Davis in 1915.

Chemistry:——> It is a Complex primary alcohol Called Retinol which is stored in the animal body along with fatty acid the ~~pal~~ palmitic acid. It is formed by oxidation of β— Carotene molecule at also Central C. double bond terminating in an alcohal group. Vit A is divided into A_1 and A_2. In Vit A_2 there is an additional double bonds in the β ionic ring when it is present in aldehyde form Called retinals which are important in vision.

Source:——> Vit A is present in fish, liver oil, Butter, whole milk and egg yaulk. It is also faund in all pigmented or yellow vegetables and fruits such as tamatoes, papaya, Carrot.

Function :—→

(I) Maintance and growth of epithelial tissues.
(II) Essential for growth of skeletone and other Connective tissues.
(III) It Constitute visual perplex rhodopsin a photosensitive pigment of the rod cell and iodopsin present in Cone Cells.
(IV) It prevents infection
(V) It also helpful to maintain normal fertility.

Deficiency :—→ (I) Night Blindness.
(II) Keratinization of occular tissues.
(Xeropthalmia)

(B) Vitamin D :—→ It was discovered by MELLAN by in 1921

Chemistry :—→ Vit D is also known as Califerols which is a group of steroid Compounds. Vit D is divided into two groups :—

(I) ErgoCaliferal (Vit D_2)
(II) CholeCalCiferal (Vit D_3)

Vitamin D_2 does not occur in nature form. It is produced artificially by ultraviolet light. In plants this vit as is present in ergal & yest. Recently it is discovered that vit D is produced in the skin and Carried to different parts of the body. Vit D_2 and D_3 are quite stable and are not destroyed by heat or oxidation.

Sources and absorption :—→ yeast is the most partical Sources of Vit D. It is also faund in Snail Earthworms, Hen's egg milk The rich Sources of Vit D_3 are the liver & viscera of fish milk and Butter also Contain D_3. when it is absorbed from ultraviolet rays CholeCalCiferal tightly bound to an α-2-globulin and then transported to plasma liver is the chief and site of storage of vit D Although very small amount is stored in

brain lungs, spleen and bones.

Function :→

(I) It increases the absorption of Calcium and phosphorus form the intestine.
(II) It also helps in the process of Calcification of bones.
(III) It stimulates the secretion of parathyroid hormones.
(IV) It increases the Citrate Content of bone blood and tissues.

Deficiency :→

(I) osteomalacia → in adults particularly in bones become soft during pregency.
(II) Rickets :→ in Childreen, slow growth, degenerate and deformed bones.

(C) Vitamin E :→ It was discovered by Evans & Emercian in 1936. The vit is also called tocopherol and antisterility factor which is essential in both male and female.

Chemistry :→ It is an unsaturated alcohal divided into α, β, γ and E - tocopheral. The α tocopherol are weidely distributed stable to heat, acids and alkalies. It is insaluble in water and it antioxidant activity due to presence of phenolic hydroxyl group.

Source :→

The main source of tocopheral are plant oil. such as wheat, gram, rice, Cotton seed and lipids of green leaves. It is also faund in eggs, muscles, fish liver and chickens.

Function :→ (I) It is an important antioxidant due to which polyunsaturated fatty acid are established. It prevents damage of lung tissues from ozone and nitrogen dioxide.
(II) It has very important role in reproduction.
(III) Vit E is involved in biological oxidation b/w

cytochrome b and c.

Deficiency: ⟶

It's deficiency effects on reproduction.

(D) Vitamin K (Antihaemorrhagic factor): ⟶

It was discovered by DAM in 1930.

Chemistry: ⟶ Nephthoquinone derivatives which occurs in nature. It has a phytyl chain attached at position 3 and which strongly placed the presence at methyl group at position 2 the vit K is present in two forms: —

1. phylloquinone — K
2. phytomadione — K$_1$

It is a fat soluble, heat stable but can be destroyed by light, alkali and alcohol.

Sources: ⟶ It is richly available in cabbage, spinach, tomato, soyabean and alphalfa.

Function: ⟶

(I) It helps to maintain the formation of normal prothrombin and factor VII th of blood clotting.

(II) It acts as a prosthetic group to an apoenzymes to produce a holoenzyme.

(III) It shortens the synthesis time of prothrombin in liver.

(IV) Vit K is an essential factor of phosphorelation

(V) Bile salts are essential for the absorption of vit K therefore in liver disease vit K is not absorbed.

Deficiency: ⟶

Absence of vit K results defective blood coagulation and haemorrhages.