

VITAMINS

Vitamins: are organic compounds occurring in small quantities in different natural foods and necessary for growth and maintenance of good health in human. Vitamin requirements vary from species to species and are influenced by age, gender, and physiological conditions such as pregnancy, breast-feeding, physical exercise, and nutrition.

The vitamins are mainly classified into:

Vitamins are classified according to their ability to be absorbed in fat or water.

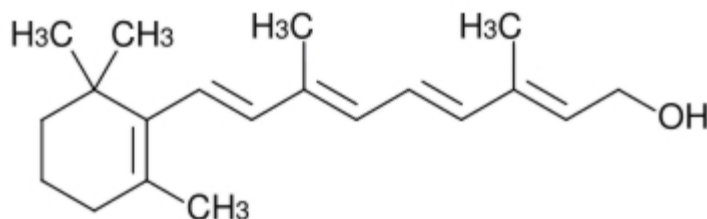
1. **Fat Soluble Vitamins (فيتامينات ذائبة في الدهون):** These are oily and hydrophobic (نافره من الماء) compounds. These are stored in the liver كبد and are not excreted out of the body. Vitamin A, D, E and K are fat soluble vitamins. Because these vitamins can be stored, their excessive intake may have toxic effect and can result in **Hypervitaminosis** فرط الفايتمين.

2. **Water Soluble Vitamins (فيتامينات ذائبة في الماء):** Vitamin B complex and vitamin C are water soluble. They are compounds of carbon, hydrogen, oxygen and nitrogen. They are not stored in the body therefore they required daily in small amount.

FAT SOLUBLE VITAMIN

1- VITAMIN A:

Vitamin A is a pale yellow primary alcohol derived from carotene. It includes Retinol (alcoholic form), Retinal (Aldehyde form) and Retinoic acid (acidic form).



Source: المصدر

- In animal form, vitamin A is found in milk, butter, cheese, egg yolk صفار البيض, liver, and fish-liver oil.
- In plant source it obtained from vegetables as carrots جزر, broccoli بروكلي, squash قرع, spinach سبانغ, and sweet potatoes.

Physiological Significance: الفائدة الفسيولوجية

- All three forms of vitamin A are necessary for proper growth, reproduction, vision, differentiation and maintenance of epithelial cells تمايز وصيانته الخلايا الطلئية.
- Vitamin A accelerates normal formation of bone and teeth.
- Retinoic acid is needed for glycoprotein synthesis صناعة البروتين السكري.

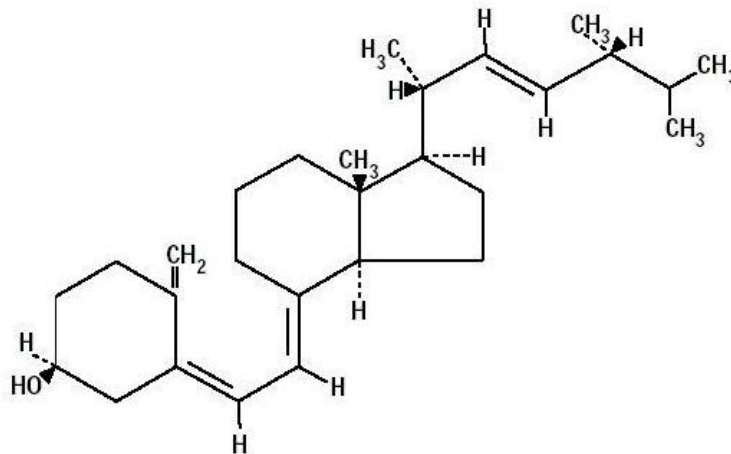
Deficiency نقص of Vitamin A:

- An early deficiency symptom is night blindness (difficulty in adapting to darkness) العشو الليلي.
- Other symptoms اعراض are excessive skin dryness جفاف الجلد.
- Lack of mucous membrane secretion افرازات الأغشية المخاطية.
- Dryness of the eyes جفاف العين.

Hypervitaminosis فرط of Vitamin A:

Excess vitamin A can interfere with growth damage red blood cells, and cause skin rashes طفح جلدي, headaches صداع, nausea غثيان, and jaundice يرقان.

2. VITAMIN D (Calciferol or Antirachitic Vitamin):



Source:

- Vitamin D is obtained from egg yolk, fish liver oil .
- It is also manufactured in the skin when it exposed to sun light.

Physiological Significance:

- This vitamin is necessary for normal bone and teeth formation تكوين العظام والاسنان
- It decreases pH in the lower intestine.

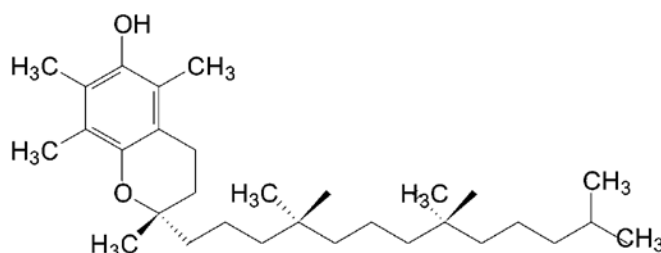
Deficiency:

- Vitamin D deficiency produces **rickets** كساح in children and **Osteomalacia** لين العظام in adult.

Hypervitaminosis of Vitamin D:

- Because vitamin D is fat-soluble and stored in the body, excessive consumption can cause vitamin poisoning تسمم, kidney damage تلف الكلية, lethargy كسل, and loss of appetite.

3. VITAMIN E (Tocopherol):



Source:

- It is found in vegetable oils, wheat grain حبوب القمح, liver, and green vegetables خضراوات .
- They are also present in little amount in meat, milk and eggs.

Physiological Significance:

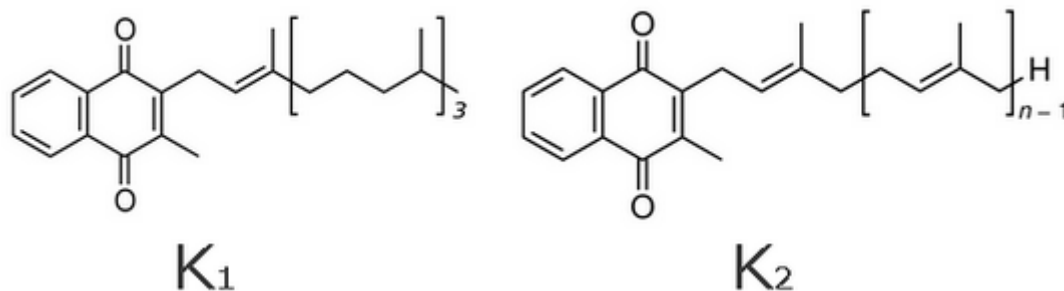
- Vitamin E acts as antioxidants مضاد للأكسدة. They play some role in forming red blood cells and muscle عظمات and other tissues أنسجة and in preventing the oxidation of vitamin A and fats.
- It is also associated with cell maturation and differentiation.

Deficiency:

- Deficiency of vitamin E causes sterility عقم in both male and females.
- It causes muscular dystrophy ضمور العضلات.

4. VITAMIN K (Phylloquinone or Antihemorrhagic Vitamin or Coagulation Vitamin):

Vitamin K is a complex unsaturated hydrocarbon found in two forms Vitamin K₁ (Phylloquinone) and Vitamin K₂ (Menaquinone).



Vitamin K1 - Phylloquinone Source:

- The richest sources of vitamin K are fish livers, leafy green vegetables, egg yolks, and liver.
- It is also produced by bacteria in human intestine البكتريا الموجوده في الامعاء

Physiological Significance:

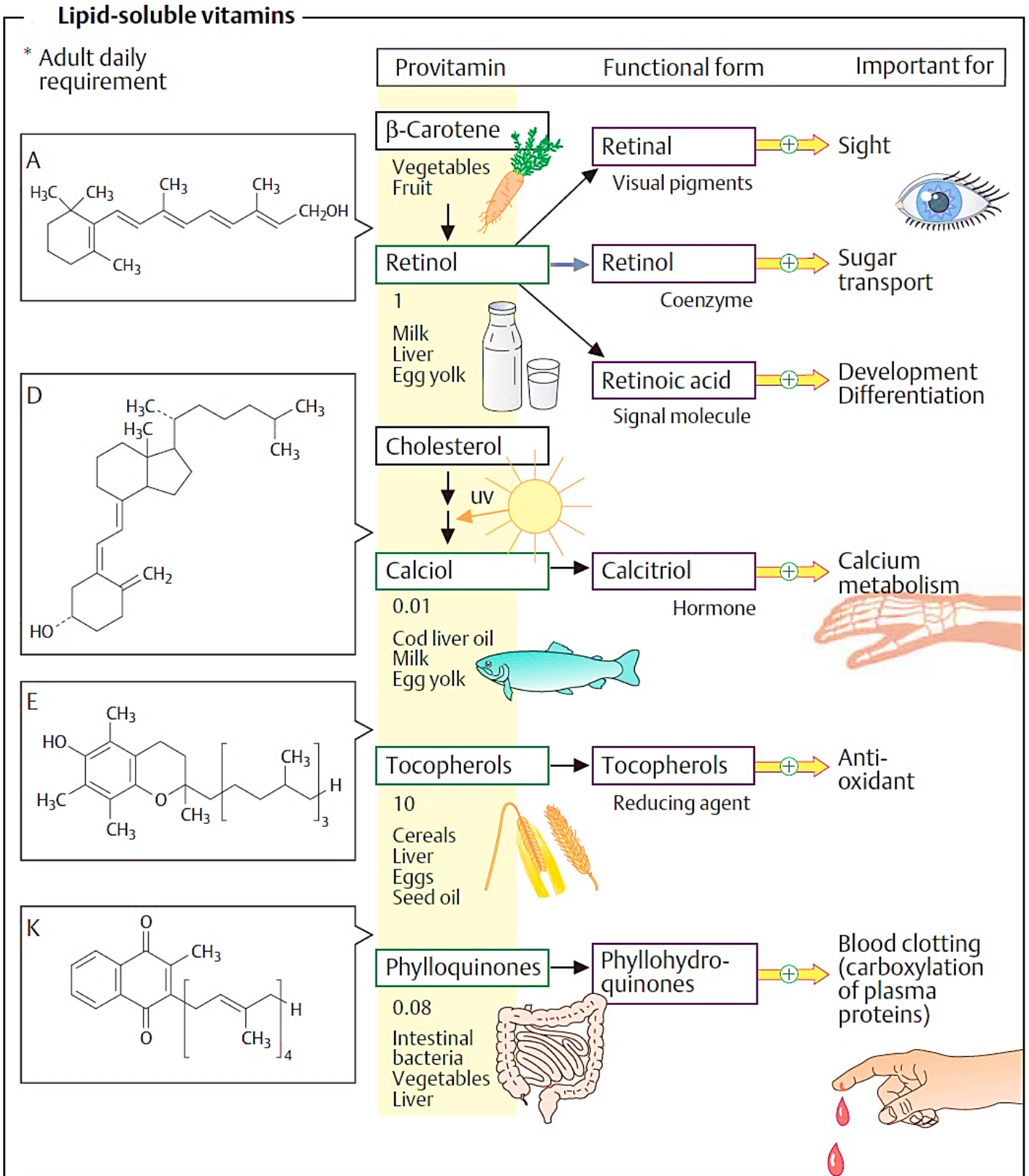
- This vitamin is necessary mainly for the coagulation of blood تخثر الدم.
- Acts as an inducer for the synthesis of RNA.
- It is also required for the absorption of fat.

Deficiency:

- Digestive disturbances may lead to defective absorption of vitamin K and hence to mild disorders in blood clotting.

Hypervitaminosis of Vitamin K:

- Administration of large doses of vitamin K produces haemolytic anemia and jaundice (يرقان) in infants because of breakdown of RBCs.



Summary of fat soluble vitamins