VITAMIN A

• Three forms vitamin A active in the body i.e. retinol, retinal and retinoic acid.
  • Beta carotene = precursor of vitamin A
  • Food from animal = retinol
  • Food from plant = carotenoid

• Main roles
  ▫ Promoting vision
  ▫ Participating in synthesis, maintaining the health of epithelial tissues and grow
  ▫ Supporting reproduction and growth
  ▫ Formation of bones and teeth
  ▫ Antioxidant – beta-carotene
DEFICIENCY VITAMIN A

© Increased susceptibility to infection, increased incidence and severity of infection.
© Impaired vision, blindness.
© Inability to see in dim light.

Sources - A color of vitamin A Foods
Corn flakes, spinach, broccoli, carrots, tomato, beef liver, pumpkin, mango
VITAMIN D (CALCIFEROL)

• Body can synthesis with the help of sunlight, using precursor that makes from cholesterol.

• Two forms
  ▫ D2 - Ergocalciferol - plant version
  ▫ D3- Cholecalciferol - animal version

• Main Roles
  ▫ Vitamin D in Bone Growth
  ▫ Vitamin D in other roles such as in tissues in brain, nervous system, skin and muscles, reproductive organ.
VITAMIN D DEFICIENCY

- **Rickets**
  - Weak, deformed bones (children)

- **Osteomalacia**
  - The adult form of rickets
  - Low intake of calcium and little exposure to sun and women go through repeated pregnancies and periods of lactation.

- **Osteoporosis**
  - Failure to synthesize adequate vitamin D or obtain enough from foods.
  - Loss of calcium from the bones.
**VITAMIN E**

- **Two forms**
  - **Tocopherol** – vegetables oils
  - **Alpha-tocopherol** – Human body

- **Main Role**
  - **Antioxidant**
    - Body primary defenders against the effects of free radicals
    - May reduce the risk of hearts disease by protecting low-density lipoproteins against oxidation.
VITAMIN E DEFICIENCY

• Rare cases

• It cause fat mal-absorption
  ▫ Sign of vitamin E deficiency known as erythrocyte hemolysis
    • Premature infants, born before the transfer of vitamin E from mother to the infant that takes places in the last weeks pregnancy.

• Sources
  ▫ Vegetables oils, seed and nuts
VITAMIN K

- Three forms of vitamin K:
  - K1 - plant - Phylloquinone
  - K2 - animal - Menaquinone
  - K3 - synthesis - Menadione

- Vitamin K can be obtained from non-food sources, i.e., bacteria from the GI tract.

- Main roles:
  - Essential component of mechanisms that cause blood to clot when bleeding occurs.
BLOOD CLOTTING PROCESS

When blood is exposed to air, foreign substances, or secretions from injured tissues, platelets (small, cell-like structures in the blood) release a phospholipid known as thromboplastin. Thromboplastin catalyzes the conversion of the inactive protein prothrombin to the active enzyme thrombin. Thrombin then catalyzes the conversion of the precursor protein fibrinogen to the active protein fibrin that forms the clot.
VITAMIN K DEFICIENCY

• Rare cases
• It can occur in two circumstances
  ▫ Fat absorption falters when bile production fails.
  ▫ Some drugs disrupt vitamin K synthesis and action in the body.
• Cause hemorrhagic disease
  ▫ A disease characterized by excessive bleeding
• Sources
  ▫ Milk, eggs, sprouts, liver, cabbage, spinach and broccoli.
THANK YOU