**Community medicine …**

**Nutrition 2**

* **Slide 26 …**

Alcohol is a high-energy molecule **(7Cal/mol )**. but it’s a **toxic** material , consuming high amounts of alcohol causes **liver cirrhosis** “ "تشمع الكبد

* **Slides 27 🡪 30**

We have **20** amino acids , **8** of them are essential amino acids that cannot be synthesized in adults . In infants and newborns , they are **9** .

You have to memorize all these amino acids :p I know it’s so hard 😜

* **Slide 31**

**Dietary protein quality**

-**limiting amino acids** : some dietary proteins don’t have some amino acids , these proteins have low quality .

-**digestibility** of certain protein also determines it’s quality .

- **Protein digestibility-corrected amino acid score (PDCAAS)** : is a method of evaluating the protein quality based on both the amino acid requirements of humans and their ability to digest it .

- **Animal proteins** are generally complete and contain the essential amino acids in appropriate proportions for a healthy diet. **Plant proteins** are often incomplete and have insufficient quantities of one or more amino acids. A vegetarian diet requires careful selection of foods to ensure all essential amino acids are present in sufficient amounts.

* **Slide 32 , 33**

**Vitamins** : are **organic** materials that regulate **growth** and metabolism .

 Classified according to their **solubility** in water , into **lipid soluble (D , E , K , A )** and **water soluble (other vitamins –refer to slides , you have to memorize them )**

Note : for each vitamin , you have to know its **source** , **functions** and **related disease** . The slides are enough , some points will be explained here .

* **Slide 34** 🡪 **38 Vitamin A**

(DRI : Daily recommended intake )

Major sources 🡪 **Turkey** and **sweet potato**

Vitamin A deficiency 🡪 affect **eyes**

In developing world it may cause blindness

* **Slide 39** 🡪 **43 Vitamin D**

Synthesis of **steroid hormones** , and **Calcium – phosphorus homeostasis**

Vitamin D deficiency 🡪 **rickets** in children , **ostemalacia** in adults , **osteoporosis** in menopause women .

Major 3 signs of Vitamin A toxicity 🡪 excess **calcification** if bones , **kidney stones** ,and hardening **(calcification) of soft tissues** , respectively .

* **Slide 44 , 45 vitamin E**

-antioxidant ,

Note : (**vitamins A , E ,C + selenium** ) are antioxidants

Vitamin E deficiency 🡪 **hemolysis** + **anemia**

* **Slide 46 , 47 Vitamin k**

-important in blood clotting .

Vitamin K deficiency 🡪 tendency to bleed .

**Slide 48 🡪 51 Thiamine (B1)**

-heart , nerves and muscles normal function .

-**cereal grains** provide most in human diet .

Thiamine deficiency 🡪 **beriberi**

**Beriberi :** refers to a cluster of symptoms caused primarily by a nutritional deficit in vitamin B1 (thiamine). Beriberi has conventionally been divided into three separate entities :

1. **Dry beriberi** causes wasting and partial paralysis resulting from damaged peripheral [nerves](https://en.m.wikipedia.org/wiki/Nerve). It is also referred to as endemic neuritis.
2. **Wet beriberi** affects the heart and circulatory system. It is sometimes fatal, as it causes a combination of heart failure and weakening of the capillary walls, which causes the peripheral tissues to become edematous.
3. **Infantile beriberi** usually occurs between two and five months of age in children whose mothers have inadequate thiamine intake.
* **Riboflavin (slides are enough )**
* **Slides 54** 🡪 **56 (Niacin)**

-Very important in **energy production** .

-comes from TRP Amino acid .

-major source 🡪 **yeast**

 Niacin deficiency 🡪 **pellagra** (الحصاف)

 **Nutrition 3**

**This is the last lecture that is included in the midterm exam …**

**Lets Continue talking about vitamins ..**

 **Pantothenic acid , B6 🡪 slides are enough**

* **Slides 60 , 61 (Folate)**

Folate deficiency :

**-** **Megaloblastic anemia** : large RBCs , with lower hemoglobin .. we know that the life span of RBCs is 120 ,but here , RBCs undergo hemolysis **.**

**- Neural tube defects** (**NTDs**) are a group of conditions in which an opening in the spinal cord or brain remains from early in human development … so we advance pregnant women to take 400mg/D of folic acid to prevent NTD in their growing infant ..

* **Slides 62 + 63 (vitamin B12 )**

-Vitamin B12 contains **Cobalt .**

-Found only in **animal tissues** .

-Vitamin B12 deficiency :

- **Pernicious anemia** 🡪 loss of gastric parietal cells, which are responsible, in part, for the secretion of intrinsic factor, a protein essential for subsequent absorption of vitamin B12 in the ileum .

* **Slides 64** 🡪 **69**

 **Biotin, vitamin C , Choline and carnitine 🡪 the slides are enough .**

**Slides 70 🡪 104**

**Minerals** : inorganic compounds , classified into :

1-Macrominerals : we need high amounts of these minerals .

2-Microminerals : low amounts are enough

3-Ultratrace elements : trace amounts are more than enough ( 1mG per Kg or less)

Macrominerals :

* **Calcium :**

-parathyroid hormone **PTH** 🡪 regulation of calcium absorption .

-calcium deficiency 🡪 osteoporosis in menopause women .

* **Phosphorus :** don’t worry about P , because usually P and Ca are conjugated .. in **2:1** ratio .
* **Magnesium** : cofactor in many enzymes
* **Sulfur** : cysteine , cysteine and methionine contains S 🡪 disulfide bridges in proteins **.**

**Microminerals :**

* **Iron :**

**-ferric** 🡪 Fe+++ 🡪 reduced iron  **-ferrous** 🡪 Fe++ 🡪 oxidized iron

-high **ascorbic** acid 🡪 **enhance** iron absorption

-**fibers** (cellulose) 🡪**excretes** iron by feces 🡪 reduces iron absorption

-Iron deficiency 🡪 **microcytic anemia** (small RBCs , with low hemoglobin )

-Iron overload 🡪 **Hemochromatosis** (accumulation of iron in the body , specially in the lungs , causing symptoms similar to emphysema)

* **Zinc :**

 **Zinc deficiency 🡪** may cause cretinism ( growth retardation “dwarfism” , mental retardation , incomplete growth in reproductive organs )

* **Fluoride:**

-important fir dental health

**Fluoride deficiency** 🡪 dental caries

**Fluoride toxicity** 🡪 0.1 mg/Kg in water daily 🡪 **fluorosis** (dark yellow spots in teeth)

* **Cupper :**

Cupper and zinc are conjugated in *Cu-Zn superoxidase dismutase enzyme* 🡪 beneficial for hurt .

* **Iodine :**

-**Iodine** **deficiency 🡪**

**1- goiter 🡪endemic in Jordan .**

**2- cretinism ( major cause) ..**

**3-Hypothyroidism (dwarfism)**

**4- Hyperthyroidism** (symptoms : Tremor/shakiness , Heart palpitations and Protruded eyes )

* **Selenium 🡪 antioxidant**
* **Cobalt🡪 B12**

**Other minerals 🡪 from the slides :p**