

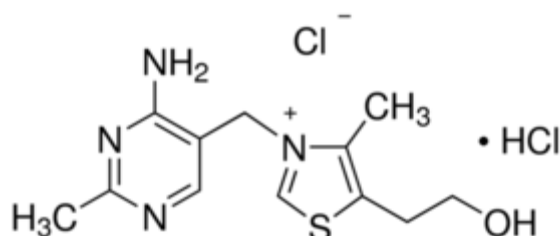
WATER SOLUBLE VITAMIN

Known also as vitamin B complex, these are fragile, water-soluble substances, several of which are particularly important to carbohydrate metabolism. They include **Vitamin B₁ (Thiamine)**, **Vitamin B₂ (Riboflavin)**, **Vitamin B₃ (Niacin or Nicotinic Acid)**, **Vitamin B₆ (Pyridoxine)**, **Vitamin B₁₂ (Cobalamin)** etc.

5. VITAMIN B₁ (Thiamine):

Vitamin B1 (Thiamine Chloride)

Thiamine, or vitamin B₁, a colorless, crystalline substance. It is readily soluble in water and slightly in ethyl alcohol.



Source:

- Vitamin B₁ is abundantly found in germinating seeds البذور, un-milled cereals الحبوب غير المطحونه, beans فاصولياء, orange juice, tomato, egg, meat, fish, organ meats (liver, heart, and kidney), leafy green vegetables, nuts المكسرات, and legumes البقوليات.

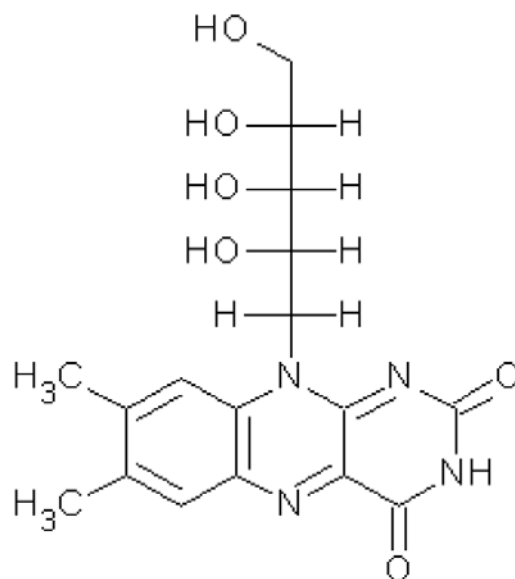
Physiological Significance:

- Acts as a catalyst مساعد in carbohydrate metabolism, enabling pyruvic acid to be absorbed and carbohydrates to release their energy.
- Thiamine also plays a role in the synthesis of nerve-regulating substances. صناعه مواد ضروريه في السيطرة على النشاط العصبي.

Deficiency:

- Deficiency in thiamine causes beriberi البريبري, which is characterized by muscular weakness ضعف العضلات, swelling of the heart تضخم القلب, and leg cramps تشنجات في الساق.

6. VITAMIN B₂ (Riboflavin):



Source:

- The best sources of riboflavin are liver, milk, egg, meat, dark green vegetables, whole grain and enriched cereals, pasta, bread, and mushrooms فطر.

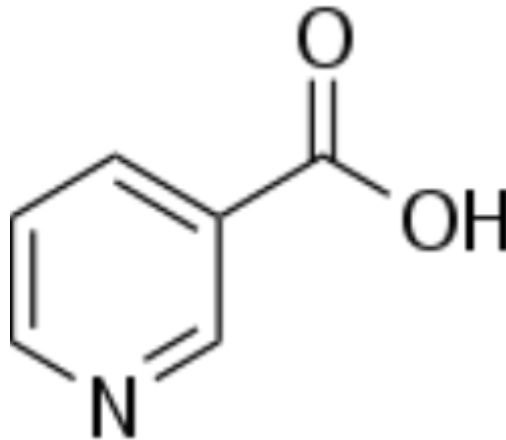
Physiological Significance:

- It is essential for carbohydrate metabolism. Enzyme containing riboflavin is called **Flavoproteins**.
- It acts as coenzyme for enzyme catalyzing oxidation-reduction reaction.

Deficiency:

- Its deficiency causes **Glossitis** التهاب اللسان (inflammation of tongue).
- Lack of thiamine causes skin lesions, especially around the nose and lips, and sensitivity to light.

7. VITAMIN B₃ (Niacin or Nicotinic Acid):



Vitamin B3 (Niacinamide) Source:

- The best sources of niacin are liver, poultry الدواجن, meat, fish, whole grain and enriched cereals, dried beans فاصوليا and peas بازلاء, and nuts مكسرات.
- The body also makes niacin from the amino acid tryptophan.

Physiological Significance:

- Nicotinic acid is essential for the normal functioning of skin, intestinal tract الامعاء and the nervous system الجهاز العصبي.
- Vitamin B₃ works as a coenzyme in the release of energy from nutrients.

Deficiency:

- A deficiency of niacin causes **pellagra** البلغرا, the first symptom of which is a sunburn like eruption that breaks out where the skin is exposed to sunlight.

الاعراض الأولى للبلغرا هي حدوث احمرار في الجلد عند تعرضه لاشعه الشمس

Later symptoms are a red and swollen tongue, diarrhea, mental confusion, irritability, and, when the central nervous system is affected, depression and mental disturbances.

الاعراض اللاحقه للبلغرا هي احمرار وانتفاخ اللسان، الاسهال، التشوش الذهني، التهيج وعند تأثر الجهاز العصبي المركزي يصاب المريض بالآكتئاب والأضطرابات النفسية.