



MJF COLLEGE OF VETERINARY & ANIMAL SCIENCES, CHOMU, JAIPUR (RAJ.)

DEPARTMENT OF ANIMAL NUTRITION

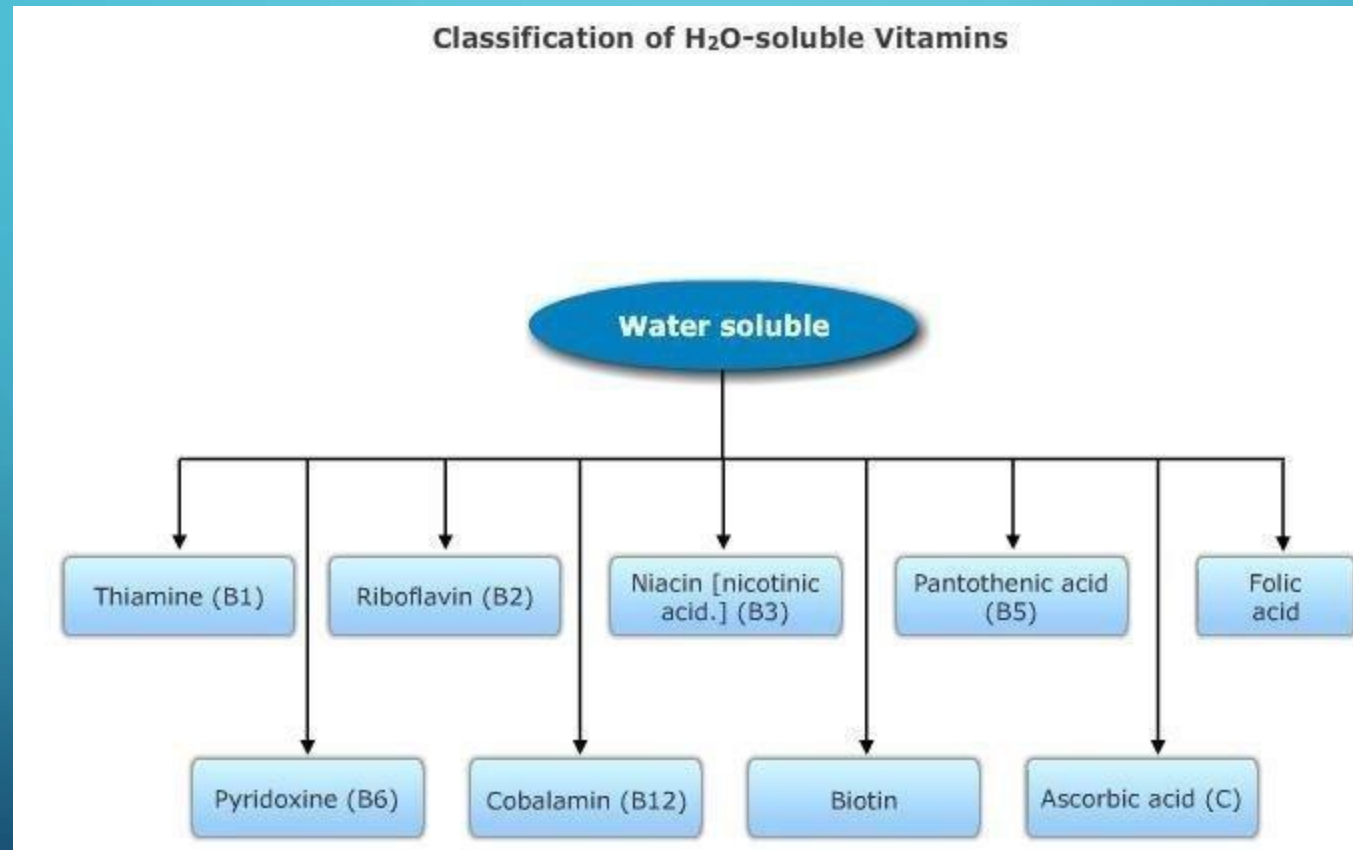
**WATER SOLUBLE VITAMINE
DATE- 28/12/23 -**

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VITAMINS: DIETARY ESSENTIAL AND METABOLIC ESSENTIAL

- Some vitamins are metabolic essential, but not dietary essential, for certain species because they can be synthesized readily from other food or metabolic constituents.
- For example B- vitamins are essential for normal ruminant metabolism but are not needed in the diet because of bacterial synthesis in the rumen.
- Vitamin B12 is not dietary essential for ruminants provided cobalt is present in the diet since bacteria can synthesize it in the rumen.
- Vitamin-C is not dietary essential for many animals except humans, Guinea pigs.

CLASSIFICATION OF VITAMINS



- **DEFICIENCY SYMPTOMS :**

1. **Night blindness (Nictalopia):** Deficiency of vitamin A first manifests as a slow, dark adaptation and progresses to total blindness.
2. **Xerophthalmia :** It is characterized by a dry condition of the cornea and conjunctiva, cloudiness and ulceration.
 - **Copious lacrimation** is a more prominent eye symptom in cows and horses.



Xerophthalmia



Copious lacrimation

Source: <https://www.cram.com/flashcards/ocular-diseases-of-cattle-and-sheep-7741052>

3. **Keratinization of epithelium:** Normal epithelium (columnar epithelium) in various locations of body like Respiratory, alimentary, reproductive and genitourinary tracts become replaced by a stratified squamous, keratinising epithelium (cornified cells).
4. **Reproductive performance is impaired in male and female.**

VITAMIN- B COMPLEX

• SOURCE :

1. Brans and rice polish are rich sources of **Thiamin**.
2. Milk is a rich source of **Riboflavin**.
3. About **40%** of niacin in **oil seeds** and **85-90%** of niacin in **cereals** is present as bound niacin.
4. Liver and kidney are excellent sources of **vitamin B12**.
5. Groundnut meal, rice bran, wheat bran, cane molasses are rich sources of **pyridoxine**.

• TYPES OF B- COMPLEX:

1. VITAMIN B1 (THIAMINE)
2. VITAMIN B2 (RIBOFLAVIN)
3. VITAMIN B3 (NICOTINIC ACID)
4. VITAMIN B5 (PANTOTHENIC ACID)
5. VITAMIN B6 (PYRIDOXINE)
6. VITAMIN B7 (BIOTIN)
7. VITAMIN B10, B11(FOLIC ACID)
8. VITAMIN B12

VITAMIN

DEFICIENCY SYMPTOMS

THIAMINE (B1)

RUMINANTS : polioencephalomalacia , star gazing.
POULTRY : polyneuritis .
HUMAN : Beriberi.

RIBOFLAVIN (B2)

SWINE: Nerve degeneration, crooked and stiff legs.
POULTRY: Curled toe paralysis, clubbed down condition.

NIACIN (B3)

HUMAN & PIGS : pellagra / Blue tongue.
DOGS: Black tongue.
CHICKS: Enlargement of hock joint.

PANTOTHENIC ACID (B5)

POULTRY: Retarded growth.
PIGS : Goose stepping gait.

BIOTIN / VITAMIN H

POULTRY: perosis, slipped tendon in chick.

FOLIC ACID (B10, B11)

CHICKS: Retarded growth, macrocytic hypochromic anaemia and perosis.

CYANOCOBALAMIN (B12)

HUMANS: pernicious anaemia
CHICKS : poor hatchability, low growth rate.
RUMINANTS : Impairs the utilisation of propionate.
CALVES: Cessation of growth, poor appetite.

VITAMIN -C

- **SOURCE:** Citrus fruits, Tomatoes, green vegetables and potatoes are principal sources.
 - Raw milk is good source, but most of its lost during pasteurization.

- **FUNCTION:**

1. It is a strong antioxidant and used in industry for the preservation of fruits and vegetables.
2. Not required in rations of farm animals*.

- **DEFICIENCY SYMPTOMS:**

3. None demonstrated in livestock
4. Human deficiency : **SCURVY** – swollen and painful joints and bleeding gums and brittleness of bones.

REFERENCE: PRINCIPLES OF ANIMAL NUTRITION AND FEED TECHNOLOGY 3rd edition DV REDDY

<https://agriking.com/the-importance-of-fat-soluble-vitamins-in-ruminant-diets/>

<https://www.sweetlix.com/research-articles/immunity/the-role-of-vitamin-a-in-ruminant-nutrition/>

THANK YOU

SEE YOU AGAIN! 😊