Units of Measurement for Water-Soluble Vitamins

NOTES BY

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1. **Vitamin C:**
    - **Unit of Measurement:** Milligrams (mg)
    - **Purpose:** Acts as an antioxidant, supports collagen formation, enhances iron absorption, and boosts immune function.
    - **Examples:**
        - **Daily Requirement:** 75-90 mg for adults.
        - **Sources:** Citrus fruits (oranges, lemons), strawberries, bell peppers, and broccoli.
2. **Vitamin B1 (Thiamine):**
    - **Unit of Measurement:** Milligrams (mg)
    - **Purpose:** Supports energy production by converting carbohydrates into energy and plays a role in nerve function.
    - **Examples:**
        - **Daily Requirement:** 1.1-1.2 mg for adults.
        - **Sources:** Whole grains, pork, legumes, and nuts.
3. **Vitamin B2 (Riboflavin):**
    - **Unit of Measurement:** Milligrams (mg)
    - **Purpose:** Involved in energy metabolism, skin health, and maintaining normal vision.
    - **Examples:**
        - **Daily Requirement:** 1.1-1.3 mg for adults.
        - **Sources:** Dairy products, eggs, green leafy vegetables, and fortified cereals.
4. **Vitamin B3 (Niacin):**
    - **Unit of Measurement:** Milligrams (mg) of Niacin Equivalents (NE)
    - **1 NE = 1 mg of niacin or 60 mg of tryptophan (which is converted to niacin in the body)**
    - **Purpose:** Supports metabolism and helps lower cholesterol levels.
    - **Examples:**
        - **Daily Requirement:** 14-16 mg NE for adults.
        - **Sources:** Meat, fish, poultry, peanuts, and fortified grains.
5. **Vitamin B6 (Pyridoxine):**

- **Unit of Measurement:** Milligrams (mg)
- **Purpose:** Involved in amino acid metabolism, neurotransmitter synthesis, and hemoglobin production.
- **Examples:**
  - **Daily Requirement:** 1.3-2 mg for adults.
  - **Sources:** Poultry, fish, bananas, and potatoes.

6. **Vitamin B12 (Cobalamin):**
   - **Unit of Measurement:** Micrograms (µg)
   - **Purpose:** Essential for red blood cell formation, DNA synthesis, and neurological function.
   - **Examples:**
     - **Daily Requirement:** 2.4 µg for adults.
     - **Sources:** Meat, fish, dairy, eggs, and fortified cereals (especially important for vegetarians and vegans).
7. **Folate (Vitamin B9):**
   - **Unit of Measurement:** Micrograms (µg) of Dietary Folate Equivalents (DFE)
   - **1 DFE = 1 µg of food folate = 0.6 µg of folic acid from fortified foods or supplements**
   - **Purpose:** Supports DNA synthesis, cell division, and fetal development.
   - **Examples:**
     - **Daily Requirement:** 400 µg DFE for adults, 600 µg DFE for pregnant women.
     - **Sources:** Leafy greens, legumes, fortified grains, and citrus fruits.
8. **Biotin (Vitamin B7):**
   - **Unit of Measurement:** Micrograms (µg)
   - **Purpose:** Supports metabolism of fats, carbohydrates, and proteins; essential for healthy hair, skin, and nails.
   - **Examples:**
     - **Daily Requirement:** 30 µg for adults.
     - **Sources:** Eggs, nuts, seeds, and whole grains.

Comparison of Units for Fat-Soluble vs. Water-Soluble Vitamins

Vitamin	Type	Unit of Measurement
Vitamin A	Fat-soluble	IU, µg (RAE)
Vitamin D	Fat-soluble	IU, µg
Vitamin E	Fat-soluble	IU, mg (Alpha-tocopherol)
Vitamin K	Fat-soluble	µg
Vitamin C	Water-soluble	mg
Vitamin B1 (Thiamine)	Water-soluble	mg
Vitamin B2 (Riboflavin)	Water-soluble	mg
Vitamin B3 (Niacin)	Water-soluble	mg (NE)
Vitamin B6 (Pyridoxine)	Water-soluble	mg
Vitamin B12 (Cobalamin)	Water-soluble	µg
Folate (Vitamin B9)	Water-soluble	µg (DFE)
Biotin (Vitamin B7)	Water-soluble	µg

Conclusion:

Understanding the different units of measurement for vitamins is important in ensuring proper intake for optimal health. Fat-soluble vitamins are measured in IU or micrograms/milligrams based on their biological activity, while water-soluble vitamins are primarily measured in milligrams or micrograms, with specific units like Niacin Equivalents (NE) or Dietary Folate Equivalents (DFE) used for certain vitamins. Proper intake of both fat- and water-soluble vitamins is crucial for maintaining health and preventing deficiencies.