

Asparagus

1. **Asparagus is a source of many vitamins, including both water-soluble and fat-soluble vitamins. Make a list of water-soluble and fat-soluble vitamins. Identify the Recommended Daily Intakes (RDI) of these vitamins. How does each vitamin function in your body? What happens when your body is deficient in a certain vitamin?**

- Water-soluble vitamins dissolve in water and are easily excreted in the urine.
- Fat-soluble vitamins are not easily excreted and may be stored in the body for long periods of time.

Vitamin	Scientific name	Water or fat-soluble?	Food sources	What does it do?	Deficiency symptoms
Vitamin A	Retinol	Fat	Yellow, orange and green fruits and vegetables; milk, egg yolk	Helps eyes see in low light; helps cells grow	Night blindness; dry skin
Vitamin B ₁	Thiamin	Water	Whole and enriched grains; pork; legumes	Helps body make energy	Beriberi (muscle-wasting disease; rare in US)
Vitamin B ₂	Riboflavin	Water	Milk, eggs, whole and enriched grains, cereal	Helps body make energy	Glossitis (inflammation of or swelling tongue)
Vitamin B ₃	Niacin	Water	Whole and enriched grains; peanuts; meats	Helps body make energy	General weakness, dermatitis (dry skin), pellagra (break down of nerves)

Vitamin	Scientific name	Water or fat-soluble?	Food sources	What does it do?	Deficiency symptoms
Vitamin B ₆	Pyridoxine	Water	Meat, poultry, fish; wheat, corn	Helps body make energy; helps to make red blood cells	Anemia (low red blood cell count, low energy), dry skin, nerve wasting
Vitamin B ₁₂	Cobalamin	Water	Animal foods only; meat, milk, etc.	Helps body make energy; helps make red blood cells	Anemia
Panthenoic acid	Same	Water	Almost all plant and animal foods; organ meats	General energy production and growth	Unknown, very rare
Biotin	Same	Water	Eggs, milk, meat, intestinal bacteria	General energy production and growth	Low appetite, nausea, dry skin
Folate	Folic acid or folacin	Water	Dark green vegetables, oranges, whole wheat	Helps make red blood cells	Anemia, birth defects
Vitamin C	Citric acid	Water	Citrus fruits, tomatoes, strawberries	Keeps gums healthy; heals wounds	Scurvy (connective tissue wears out)
Vitamin D	Chole-calciferol	Fat	Milk, egg yolks, exposure to sunlight	Helps keep bones healthy	Weak bones in children (rickets) and adults (osteomalacia)
Vitamin E	Tocopherol	Fat	Vegetable oil, Beans, eggs	Helps keep cells healthy	Anemia
Vitamin K	Phylloquinone	Fate	Green leafy vegetables, egg yolks, intestinal bacteria	Helps blood clot	Defective blood clotting

	Vit A (mcg/ d)	Vit C (mg/d)	Vit D (mcg/d)	Vit E (mg/d)	Vit K (mcg/d)	Thiamin (mg/d)	Niacin (mg/d)	Riboflavin (mg/d)
All kids, ages 4-8	400	25	5	7	55	0.6	8	0.6
Boys, ages 9- 13	600	45	5	11	60	0.9	12	0.9
Boys, ages 14- 18	900	75	5	15	75	1.2	16	1.3
Girls, ages 9- 13	600	45	5	11	60	0.9	12	0.9
Girls, ages 14- 18	700	65	5	15	75	1.0	14	1.0

	Vit B6 (mcg/d)	Folate (mcg/d)	Vit B12 (mcg/d)	Pantothenic acid (mg/d)	Biotin (mcg/d)	Calcium (mg/d)
All kids, ages 4-8	0.6	200	1.2	3	12	800
Boys, ages 9- 13	1	300	1.8	4	20	1300
Boys, ages 14- 18	1.3	400	2.4	5	25	1300
Girls, ages 9- 13	1.0	300	1.8	4	20	1300
Girls, ages 14- 18	1.2	400	2.4	5	25	1300

- 2. Make a list of foods that are main sources for each vitamin. Record your food intake for one day. Determine if you are eating enough fat-soluble and water-soluble vitamins.**

Answers can be found in previous question.

- 3. White asparagus is grown from the same grown as green asparagus. Research how farmers grow the white variety. Hypothesize what process occurs (or does not occur) to make the white variety. Identify on a map the regions that produce white asparagus. Compare and contrast nutrient values for white and green asparagus.**

- Farmers grow white asparagus by burying the crowns with about one foot of soil (or shielding the crowns from sunlight) so that the spears are completely covered as they grow.
- This prevents photosynthesis from occurring – a process in which the plant develops chlorophyll causing the stems to turn green.
- White asparagus is mostly grown in colder and/or coastal climate regions like that of northern Europe and along the coastline of Northern California (Monterey County).
- Refer to Nutrition Fact labels (available on www.nal.usda.gov/fnic/foodcomp/search/; use ½ cup serving size) for nutrient similarities and differences:
 - Similarities: Calories, fat, carbohydrates, protein, sodium, cholesterol, fiber and sugar.
 - Differences: White asparagus has more potassium and Vitamin C; green asparagus has more Vitamin A, calcium and iron.

Sources:

Dietary Reference Intakes (DRIs): Recommended Intakes for Individuals, Vitamins, Food and Nutrition Board, Institute of Medicine, National Academies, 2006..

www.iom.edu/Object.File/Master/21/372/0.pdf

Dr. Richter's Fresh Produce Guide, Try-Foods International, Inc., 2005, p. 67.

www.cfaitc.org

www.calasparagus.com

www.nal.usda.gov/fnic/foodcomp/search/

Updated: November 2009