

Vitamin A

Why We Need It

Vitamin A, a fat-soluble vitamin, is essential to our health because it:

- helps our eyes adjust to a lower level of light at night in order to see normally in the dark.
- promotes normal growth and health of body cells and tissues.
- keeps skin and tissues healthy, protecting from infection.
- helps regulate the immune system.
- works as an antioxidant, slowing down or preventing cell damage, which may reduce the risk for certain cancers, heart disease and diseases of aging.

There are animal and vegetable sources of vitamin A in foods. In animal sources, vitamin A is in the form of **retinol**. Vegetable sources of vitamin A are in the form of **carotenoids**, which are found in red, yellow, orange, and many dark-green leafy vegetables. Dark or vividly colored vegetables and fruits contain the most vitamins, minerals and antioxidants, so eat them often.

Only a few of the carotenoids in foods are converted to vitamin A in the body and act as antioxidants. Beta carotene is the most familiar one.

Amounts Needed

On food labels and dietary supplements, vitamin A might be expressed as International Units (IU) or as Retinol Equivalents (RE).

Recommended intakes for vitamin A are given as "Retinol Activity Equivalents." This measurement helps to account for the differences between retinol and carotenoids. In the body it takes approximately 12 units of beta carotene or 24 units of other carotenoids to make one unit of retinol.

Recommended Daily Intakes of Vitamin A

| | Age | Vitamin A (µg/day as RAE) | |
|-----------------|-------------------|---------------------------|------|
| Infants | birth–6 months | 400 | |
| | 6 months–1 year | 500 | |
| Children | 1–3 years | 300 | |
| | 4–8 years | 400 | |
| Males | 9–13 years | 600 | |
| | 14 years and over | 900 | |
| Females | 9–13 years | 600 | |
| | 14 years and over | 700 | |
| | pregnant | ≤18 | 750 |
| | | 19-50 | 770 |
| | breastfeeding | ≤18 | 1200 |
| 19-50 | | 1300 | |

µg = micrograms
RAE = Retinol Activity Equivalents

Source: adapted from the Dietary Reference Intakes series, National Academies Press. Copyright 1997, 1998, 2000, 2001, 2002, 2004, by the National Academies of Sciences.

The Tolerable Upper Intake Level is 2,800 micrograms (µg) of Retinol Activity Equivalents (RAE) daily for ages 14-18 and 3,000 micrograms per day for adults.

Sources

To get enough vitamin A, eat a variety of fruits and vegetables that contain carotenoids, as well as dairy products fortified with vitamin A. Vegetarians, and people who eat few animal-based foods, should get plenty of carotene-rich plant foods every day.

Liver, egg yolks, and fish oil are good animal sources of vitamin A. Here are some foods and the amount of vitamin A they contain.

Sources of Vitamin A

| Food | Vitamin A (RAE*) |
|--|------------------|
| sweet potato, cooked, 1 medium | 1240 |
| carrot, raw, 1 medium | 1010 |
| pumpkin, cooked, ½ cup | 660 |
| kale, boiled, ½ cup | 445 |
| cantaloupe, cubed, 1 cup | 260 |
| apricots, 3 medium | 140 |
| egg yolk, cooked, 1 large | 100 |
| cheese, cheddar, 1 oz | 90 |
| milk, 1 cup | 80 |
| broccoli, pieces, 1 cup | 70 |
| *Retinol Activity Equivalents oz = ounces | |

If We Don't Get Enough

Symptoms of vitamin A deficiency include: night blindness, dry scaly skin, increased risk for infections, and poor growth.

If We Get Too Much

Beta carotene from fruits and vegetables is good for the body. High carotenoid intake can cause the skin to turn yellow, but this is not harmful. However, taking large amounts of vitamin A in supplements over time can be harmful, because the excess is stored in the body.

The following severe health problems can result from taking large doses of vitamin A in the form of **retinol**, most likely from dietary supplements: vomiting or appetite loss, dry scaly skin, bone and joint pain, abnormal bone growth, and liver damage.

Vitamin A toxicity can kill you! **Limit your total vitamin A intake from retinol to less than 3,000 µg per day.**

Supplements

Vitamin A is widely available in foods and is easily stored in the body. Therefore, we don't need to take vitamin A supplements. Pregnant women especially should avoid taking **retinol** supplements, because high doses can cause birth defects. Choose prenatal supplements that include **beta carotene** as the vitamin A source.

For More Information

The Family and Consumer Sciences (FCS) agent at your county Extension office may have more written information and nutrition classes for you to attend. Also, your doctor, health care provider, or a registered dietitian (RD) can provide reliable information.

Reliable nutrition information may be found on the Internet at the following sites:

<http://hgic.clemson.edu>

<http://virtual.clemson.edu/groups/NIRC/>

<http://www.eatright.org>

<http://www.nutrition.gov>

<http://www.nal.usda.gov/fnic>

Sources:

1. Jensen, Nan C. and Linda B. Bobroff. University of Florida Extension. *Facts About Vitamin A*. FCS8639. April 2006. <http://edis.ifas.ufl.edu/publications.html>
2. Duyff, Roberta Larson. American Dietetic Association *Complete Food and Nutrition Guide, 3rd Edition*. 2006.
3. National Academies of Sciences. National Academies Press. *Dietary Reference Intakes series*. 2004.
4. National Institutes of Health. NIH Clinical Center, Office of Dietary Supplements. *Dietary Supplement Fact Sheet: Vitamin A and Carotenoids*. April 2006. <http://ods.od.nih.gov/factsheets/vitamina.asp>
5. USDA Agricultural Research Service. *New Method Leads to New Findings Concerning Carotenoid Absorption*. October 2005. <http://www.ars.usda.gov/is/pr/2005/051018.htm?pf=1>

This information has been reviewed and adapted for use in South Carolina by Janis G. Hunter, HGIC Nutrition Specialist, and Katherine L. Cason, Professor, State Program Leader for Food Safety and Nutrition, Clemson University. (New 07/07.)

This information is supplied with the understanding that no discrimination is intended and no endorsement by the Clemson University Cooperative Extension Service is implied.