

# VITAMIN A AND CAROTENOIDS

## Fact Sheet for Consumers



Vitamin A is found in a variety of foods, including green, orange, and yellow vegetables, such as broccoli, carrots, and squash.

### What are vitamin A and carotenoids and what do they do?

Vitamin A is a fat-soluble vitamin that is naturally present in many foods. Vitamin A is important for normal vision, the immune system, reproduction, and growth and development. Vitamin A also helps your heart, lungs, and other organs work properly. Carotenoids are pigments that give yellow, orange, and red fruits and vegetables their color. Your body is able to convert some carotenoids into vitamin A.

There are two different sources for vitamin A:

- **Preformed vitamin A** is found in fish, organ meats (such as liver), dairy products, and eggs.
- **Provitamin A carotenoids** are turned into vitamin A by your body. They are found in fruits, vegetables, and other plant-based products. The most common provitamin A carotenoid in foods and dietary supplements is beta-carotene.

### How much vitamin A do I need?

The amount of vitamin A you need depends on your age and sex. Average daily recommended amounts of preformed vitamin A and provitamin A carotenoids are listed below in micrograms (mcg) of retinol activity equivalents (RAE).

Life Stage	Recommended Amount
Birth to 6 months	400 mcg RAE
Infants 7–12 months	500 mcg RAE
Children 1–3 years	300 mcg RAE
Children 4–8 years	400 mcg RAE
Children 9–13 years	600 mcg RAE
Teen males 14–18 years	900 mcg RAE
Teen females 14–18 years	700 mcg RAE
Adult males	900 mcg RAE
Adult females	700 mcg RAE
Pregnant teens	750 mcg RAE
Pregnant adults	770 mcg RAE
Breastfeeding teens	1,200 mcg RAE
Breastfeeding adults	1,300 mcg RAE

### What foods provide vitamin A?

Vitamin A is found naturally in many foods and is added to some foods, such as milk and cereal. You can get recommended amounts of vitamin A by eating a variety of foods, including the following:

- Some types of fish, such as herring and salmon
- Beef liver and other organ meats (which are also high in cholesterol, so limit the amount you eat)
- Green leafy vegetables and other green, orange, and yellow vegetables, such as spinach, sweet potatoes, carrots, broccoli, and winter squash

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- Fruits, including cantaloupe, mangos, and apricots
- Dairy products, such as milk and cheese
- Fortified breakfast cereals
- Eggs

### What kinds of vitamin A dietary supplements are available?

Vitamin A is available in dietary supplements, usually in the form of retinyl acetate or retinyl palmitate (preformed vitamin A), beta-carotene (provitamin A), or a combination of preformed and provitamin A. Most multivitamin-mineral supplements contain vitamin A. Dietary supplements that contain only vitamin A are also available.

### Am I getting enough vitamin A?

Vitamin A deficiency is rare in the United States because most people get enough vitamin A from the foods they eat. However, vitamin A deficiency is common in many developing countries, especially in young children.

Certain groups of people are more likely than others to have trouble getting enough vitamin A:

- Premature infants
- Infants, young children, pregnant people, and breastfeeding people in developing countries
- People with cystic fibrosis
- People with Crohn's disease, ulcerative colitis, or celiac disease

### What happens if I don't get enough vitamin A?

The most common sign of vitamin A deficiency is an eye condition called xerophthalmia. Xerophthalmia is the inability to see in low light, and it can lead to blindness if it isn't treated.

A long-term deficiency of vitamin A can also lead to a higher risk of respiratory diseases (such as pneumonia) and infections (such as measles and diarrhea). It can also cause anemia (a condition in which the red blood cells do not supply enough oxygen to the body). In severe cases, not getting enough vitamin A can increase your chances of dying.

### What are some effects of vitamin A on health?

Scientists are studying vitamin A to understand how it affects health. Here are some examples of what this research has shown.

#### Cancer

People who eat a lot of foods containing vitamin A or beta-carotene might have a lower risk of certain kinds of cancer. But studies do not show that vitamin A or

beta-carotene supplements help prevent cancer or lower the chances of dying of cancer. In fact, some studies find that in people who smoke or used to smoke, high doses of beta-carotene supplements can increase the risk of lung cancer and death.

#### Age-related macular degeneration (AMD)

AMD is the loss of central vision as people age. It's the most common cause of vision loss in older people. Studies show that a supplement containing vitamins C and E, zinc, and copper with or without beta-carotene helps slow down the rate of vision loss in people with AMD who are at high risk of developing advanced AMD. The same supplement, containing lutein and zeaxanthin instead of beta-carotene, reduces the risk of AMD even more and eliminates the increased risk of lung cancer from high doses of beta-carotene.

#### Measles

In developing countries where vitamin A deficiency is common, children with measles are more likely to have severe [symptoms](#) and may die from the disease. In these children, taking supplements with high doses of vitamin A might help prevent new cases of measles and might lower their risk of dying of measles.

### Can vitamin A be harmful?

Yes, high intakes of some forms of vitamin A can be harmful.

Getting too much preformed vitamin A (usually from supplements or certain medicines) can cause severe headache, blurred vision, nausea, dizziness, muscle aches, and problems with coordination. In severe cases, getting too much preformed vitamin A can even lead to coma and death.

If you take too much preformed vitamin A while pregnant, it can cause birth defects in your baby, including abnormal eyes, skull, lungs, and heart. If you are or might be pregnant or breastfeeding, you should not take high-dose supplements of preformed vitamin A.

High intakes of beta-carotene do not cause the same problems as preformed vitamin A. Consuming high amounts of beta-carotene can turn the skin yellow-orange, but this condition is harmless and goes away when you eat less of it. However, several studies have shown that smokers, former smokers, and people exposed to asbestos who take high-dose beta-carotene supplements have a higher risk of lung cancer and death.

The daily upper limits for *preformed* vitamin A include intakes from all sources—food, beverages, and supplements—and are listed below. These levels do not apply to people who are taking vitamin A for medical reasons under the care of a

doctor. There are no upper limits for beta-carotene and other forms of provitamin A.

Ages	Upper Limit
Birth to 12 months	600 mcg
Children 1–3 years	600 mcg
Children 4–8 years	900 mcg
Children 9–13 years	1,700 mcg
Teens 14–18 years	2,800 mcg
Adults 19 years and older	3,000 mcg

### Does vitamin A interact with medications or other dietary supplements?

Yes, vitamin A supplements can interact or interfere with medicines you take. Here are several examples:

- Orlistat (Alli®, Xenical®), a weight-loss drug, can decrease the absorption of vitamin A. This can cause low blood levels of vitamin A in some people.
- Acitretin (Soriatane®), used to treat psoriasis, and bexarotene (Targretin®), used to treat the skin effects of T-cell lymphoma, are made from vitamin A. Taking these medicines together with a vitamin A supplement could cause dangerously high levels of vitamin A in the blood.

Tell your doctor, pharmacist, and other healthcare providers about any dietary supplements and medicines you take. They can tell you if those dietary supplements might interact or interfere with your prescription or over-the-counter medicines or if the medicines might interfere with how your body absorbs, uses, or breaks down nutrients.

### Vitamin A and healthful eating

People should get most of their nutrients from food and beverages, according to the federal government’s *Dietary Guidelines for Americans*. Foods contain vitamins, minerals, dietary fiber, and other components that benefit health. In some cases, fortified foods and dietary supplements are useful when it is not possible to meet needs for one or more nutrients

(e.g., during specific life stages such as pregnancy). For more information about building a healthy dietary pattern, see the [Dietary Guidelines for Americans](#) and the U.S. Department of Agriculture’s [MyPlate](#).

### Where can I find out more about vitamin A?

#### For more information on vitamin A:

- Office of Dietary Supplements [Health Professional Fact Sheet on Vitamin A](#)
- [Vitamin A](#), MedlinePlus®

#### For more information on food sources of vitamin A:

- U.S. Department of Agriculture’s (USDA’s) [FoodData Central](#)
- Nutrient list for vitamin A (listed by [food](#) or [vitamin A content](#)), USDA
- Nutrient list for beta-carotene (listed by [food](#) or [beta-carotene content](#)), USDA

#### For more advice on choosing dietary supplements:

- Office of Dietary Supplements [Frequently Asked Questions: Where can I purchase dietary supplements?](#)

#### For information about building a healthy diet pattern:

- [MyPlate](#)
- [Dietary Guidelines for Americans](#)

#### Disclaimer

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Updated: June 15, 2022