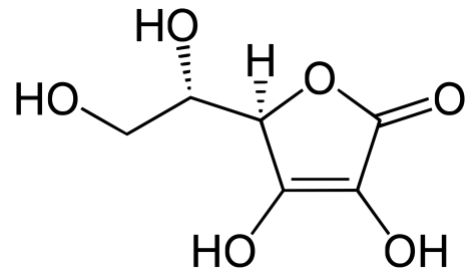


## Factsheet vitamin C (ascorbic acid)

### Functions

Regarding the effect in the metabolism, components of vitamin C interact with B-vitamins. As an essential nutrient, vitamin C acts as an antioxidant or cofactor, supporting a specific enzyme to perform its function. High levels of vitamin C are present in pituitary and adrenals as well as in eyes, the brain and white blood cells. Vitamin C fulfills functions in the synthesis of collagen and absorption of iron, free radical scavenging and in defence against infections and inflammation.



Structure of L-ascorbic acid

### Sources of vitamin C

Fruits (especially citrus fruits), cabbage, green leafy vegetables, lettuce, tomatoes, potatoes and liver (especially of ox and calf).

### Intake recommendations (D-A-CH)

	Unit	mg/day	
	Sex	m	f
Infants	0 to under 4 months		20
	4 to under 12 months		20
Children and adolescents	1 to under 4 years		20
	4 to under 7 years		30
	7 to under 10 years		45
	10 to under 13 years		65
	13 to under 15 years		85
	15 to under 19 years	105	90
Adults	19 to under 25 years	110	95
	25 to under 51 years	110	95
	51 to under 65 years	110	95
	65 years and older	110	95
Pregnant women	from the 4th month		105
Lactating women			125

### **Bioavailability**

Levels of vitamin C in foods depend on growing conditions, the season and stage of maturity as well as the storage time prior to consumption and preparation. Vitamin C is easily destroyed by heat and oxygen. The absorption level depends on the amounts consumed, usually about 70 to 90 % of vitamin C is absorbed. However, if intake exceeds 1000 mg vitamin C/day, the absorption level drops to 50 %.

### **Risk groups**

Individuals who do not consume sufficient quantities of fruits and vegetables are at risk for inadequate intake of vitamin C. Because smoking generates free radicals, individuals who smoke have increased requirements for vitamin C. Vitamin C deficiency can cause scurvy. Symptoms of scurvy are bleeding gums, small hemorrhages below the skin, fatigue, loss of appetite and weight as well as lowered resistance to infections.

### **Tolerable Upper Intake Level (UL)**

Regarding the Tolerable Upper Intake Level (UL) competent authorities provide different information due to insufficient data.

The European Food Safety Authority (EFSA) assumes that harmful side effects are unlikely to occur with a supplementation up to 1 g vitamin C/day in addition to intake by natural sources.

The Institute of Medicine (IOM) defines an UL of 2000 mg vitamin C/day for adults. For children applies an age-dependent UL, which ranges from 400 mg vitamin C/day for children aged 1 to 3 years up to 1800 mg vitamin C/day for adolescents aged 14 to 18 years.

### References and further information

German Nutrition Society (DGE) (2015): Reference Values for Nutrient Intake. 1st edition, Neuer-Umschau-Buchverlag, Neustadt an der Weinstraße.

German Nutrition Society (DGE): Reference Values vitamin C. [Online](#) [23.04.2018].

European Food Safety Authority (EFSA) (2006): Tolerable Upper Intake Levels for vitamins and minerals. [Online](#) [23.04.2018].

Linus Pauling Institute (LPI), Oregon State University: Vitamin C. [Online](#) [23.04.2018].

National Institutes of Health (NIH): Vitamin C. Dietary Supplement Fact Sheet. [Online](#) [23.04.2018].

Wikimedia Commons: Structure of L-ascorbic acid. [Online](#) [23.04.2018].

### Disclaimer

This factsheet is developed for scientific information purposes only and is not intended for marketing and/or sales claims purposes.

Fulda, April 2018