

# Beta-carotene

**β-carotene** is a retinoid, a precursor of vitamin A (2 molecules of vitamin A are formed from one molecule of β-carotene). Its sources are mainly fruits and vegetables. Vitamin A and β-carotene are lipid-soluble, so their serum levels depend on the digestion and absorption of lipids. In the circulation, β-carotene is 80% bound to LDL, 8% to HDL and 12% to VLDL. Of the serum carotenoids, β-carotene makes up about 25%. From a clinical point of view, β-carotene's very short half-life, leads to its quick conversion to vitamin A.

## Measuring β-carotene

Determination of β-carotene is done by HPLC or by an extraction method (shaking in petroleum ether/chloroform or other organic solvents) with spectrophotometric measurement. The reference values depend on the determination procedure. The range for the extraction method, i.e. the determination of total serum carotenoids, is usually 0,90–4,60 μmol/L. The narrower values are 1,12–3,72 μmol/L. When screening for malabsorption syndrome in adults, only the lower limit of 0,93 μmol/L is given. Although the extraction methodology determines the total carotenoids, the values are reported as β-carotene. For the HPLC technique, specifically determining only β-carotene, the reference values are 0,37–74 μmol/L. β-carotene levels are not significantly different depending on gender, but in men the values are lower than in women.

## Stress test with β-carotene

**The determination of β-carotene** is of clinical importance primarily as a screening test in case of suspected malabsorption syndrome. **The β-carotene exercise test** compares fasting levels and rise after exercise. The patient is given a dose of 15 000 IU with food for three days. The normal value is increased compared to the fasting value of 65 μmol/L. This stress test is very rarely used clinically, more commonly the stress test with vitamin A is used.

## Clinical significance

The determination of β-carotene is of clinical importance mainly as a screening test in case of suspected malabsorption syndrome. Elevated β-carotene levels have been reported in hypothyroidism, diabetes mellitus, myxedema, nephrotic syndrome, hyperlipoproteinemia and in pregnant women.

## Links

### Source

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### Reference literature

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