

Biotin

Physiologic Functions

Biotin coenzyme participates in carboxylation reactions as a carrier of carbon dioxide and donor of carboxyl groups to substrates. The carboxylation step is rate-limiting in fatty acid synthesis. Carboxylation steps are also required in conversion of pyruvate to oxaloacetate which drives the Krebs's cycle, in metabolism of odd chain fatty acids by converting propionyl CoA to methylmalonyl CoA, and in catabolism of leucine.

Factor Affecting Availability

Chronic consumption of raw egg whites reduces biotin availability by binding with avidin to form a nonabsorbable complex.

Deficiency

Biotin deficiency is rarely observed since it is widely available in foods. Inherited defects in biotin metabolism develop biotin deficiency as might patients receiving incomplete parenteral nutrition and infants consuming human milk with low biotin content due to poor maternal intake. Signs of biotin deficiency include hair loss, dermatosis, anorexia, nausea, weight loss, muscle pains, and localized loss of sensation.

Toxicity

Toxicity to biotin has not been observed because excess amounts are excreted in the urine.

- ❖ *The upper limit of safety for biotin has not been determined due to lack of data substantiating adverse effects at high intakes. The Food and Nutrition Board of the Institute of Medicine recommends that biotin should be consumed only from food sources to prevent intake of potentially toxic levels.*

Requirements

Biotin is available in a wide variety of foods. See table for dietary sources of this nutrient.

Life Stage	Biotin (mcg)
Infants	
0-6 mo	5
7-12 mo	6
Children	
1-3 y	8

4-8 y	12
Males	
9-13 y	20
14-18 y	25
19-30 y	30
31-50 y	30
51-70 y	30
70 y	30
Females	
9-13 y	20
14-18 y	25
19-30 y	30
31-50 y	30
51-70 y	30
70	30
Pregnancy	
18 y	30
19-30 y	30
31-50 y	30
Lactation	
18 y	35
19-30 y	35
31-50 y	35

Dietary Sources

Nuts, liver, egg yolks, soybeans and fish are rich sources of biotin. See table for dietary sources of biotin.

FOOD	Biotin (mcg)
Peanuts, _ cup	73
Filberts, _ cup	51
Almonds, _ cup	34
Peanut butter, 2 Tbl	32
Soy protein isolate, 1 oz	8.5
Egg, 1 large cooked	8.1
Cashews, _ cup	8.9
Low fat yogurt, 1 cup	7.4
Haddock, 3.5 oz cooked	6.0
Sweet potatoes, canned, _ cup	5.5
Swiss chard, cooked, _ cup	5.3
Salmon, 3.5 oz cooked	5.0
Nonfat milk, 1 cup	4.9

Tomato sauce, _ cup	4.7
Carrots, _ cup, cooked	3.9
Avocado, half	3.6
Carrot, 7.5" raw	3.6
Papaya cubes, 1 cu	3.1
Banana, one	3.1
Pork, 3.5 oz cooked	3.0
Tuna, 3.5 oz canned	3.0