



Vitamin B₇ (Biotin) in Serum

Specimen Type	Serum
Specimen Volume	2.0 mL
Collection	Red top tube with no additives or serum gel tube. Allow sample to clot for 30 minutes. Centrifuge at 3000 rpm for 10 minutes and pour serum into a transport tube. Wrap in foil to protect from light.
Minimum Volume	1.0 mL
Handling	Ship frozen on dry ice.
Rejection Criteria	Hemolyzed specimens. Lipemic specimens. Ambient temperature specimens. Not light protected. Specimens outside of listed stability.
Stability	Refrigerated for 7 days. Frozen for 14 days.
Methodology	Microbiological Assay
Reference Range	Adult Normal: 221.0 – 3,004.0 pg/mL Pediatric Normal: 100.0 – 2,460.2 pg/mL
Turnaround Time	Up to 4 business days.
CPT Code	84591



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<p>Clinical Significance</p>	<p>Biotin, vitamin B₇, or vitamin H, is a water soluble vitamin. The vitamin plays a role in the transferring of carbon dioxide in the metabolism of fat, carbohydrate and protein by functioning as an enzyme cofactor. It is involved in multiple biochemical reactions including niacin metabolism, amino acid degradation, and the formation of purine, which is an integral part of nucleic acids. It interacts with histone by the action of biotinyl-transferase. Sometimes the vitamin is used in weight reduction programs. It may be prescribed as a supplement for diabetic patients due to its role in carbohydrate metabolism. Biotin is commonly found in vitamin B complex and many food sources, such as milk, yeast, egg yolk, cereal, and mushrooms. The reference daily intake [RDI of 101.9(c) (8) (IV)] for vitamin B₇ is 300 micrograms. Deficiency in the vitamin may result in seborrheic dermatitis, alopecia, myalgia, hyperesthesia, and conjunctivitis. Disorders of biotin metabolism can be acquired or congenital. Biotinidase and holocarboxylase synthetase deficiency are the two better known forms of disorders. The lack of biotin-dependent pyruvate carboxylase, propionyl-CoA carboxylase, methylcrotonyl-CoA carboxylase, and acetyl-CoA carboxylase can lead to the life-threatening disorder of multiple carboxylase deficiency. Treatment involves a daily dose of approximately 10 mg biotin/day. Irreversible mental or neurological abnormalities may result from delayed clinical intervention.</p>
<p>Principle</p>	<p>The Biological Assay employed to quantify the level of biotin in sera uses <i>Lactobacillus plantarum</i> as a biotin-dependent microorganism that requires Biotin for growth. The assay consists of a sterile 96-well microplate. The assay is set by placing standard curve volumes, assay media, control serum and test samples in a sterile 96-well plate and adding a set volume of diluted bacterial culture. This culture is placed in last to allow for equal growth and distribution. The bioassay is placed in 37°C (+/- 3°C), humidified, 5% (+/- 1%) CO₂ incubator and allowed to incubate 24 to 36 hours. The plate is read for %Transmission. This method measures the ability of light to pass through the bacterial culture inversely measuring bacterial growth by biotin utilization.</p>