

## Vitamin B5 (Pantothenic Acid) Bioassay in Serum

<b>Specimen Type</b>	Human Serum
<b>Specimen Volume</b>	1 mL
<b>Collection</b>	SST (serum separator tube or tiger top tube). Allow sample to clot for 30 minutes at room temperature. Centrifuge the specimen for 15 minutes at 1000 x g. Freeze at or below -20 °C. Specimens should not be exposed to heat or bright light.
<b>Minimum Volume</b>	0.5 mL
<b>Handling</b>	Ship frozen on dry ice.
<b>Rejection Criteria</b>	Grossly hemolyzed specimens Hyperlipemic specimens Specimens containing particulate matter or microbial contamination Specimens outside of listed stability
<b>Stability</b>	Frozen for 21 days Room Temperature for 24 hours Refrigerated for 7 days Up to 3 freeze-thaw cycles
<b>Methodology</b>	Microbiological Assay
<b>Reference Range</b>	Adults: 37 - 147 µg/L 1-10 years old: 3.45 – 229.2 µg/L Below 1 year old: 3.45 - 825 µg/L
<b>Turnaround Time</b>	Up to 7 business days.
<b>CPT Code</b>	84591
<b>Clinical Significance</b>	Pantothenic acid, commonly known as vitamin B5, is a water-soluble vitamin. As part of acetyl CoA or an acyl carrier protein, pantothenic acid plays an essential role in metabolic pathways. It functions in the oxidation of both fatty acids and carbohydrates for energy production in the form of A TP. Vitamin B5 also participates in the synthesis of amino acids, fatty acids, ketones, cholesterol, phospholipids, and steroids. Additionally, vitamin B5 contributes to porphyrin and hemoglobin biochemistry and in adrenal function. Pantothenic acid deficiency is exceedingly rare, mostly affecting individuals who are severely malnourished. Those who lack an adequate amount of vitamin B5 may demonstrate symptoms such as parasthesias, muscle weakness, fatigue, nausea, abdominal pains and susceptibility to infection.
<b>Principle</b>	<i>Lactobacillus plantarum</i> is a bacterium known to metabolize pantothenic acid (vitamin B5). The microtiter plate wells used during this assay are pre-coated with <i>Lactobacillus plantarum</i> , and then provided with a media containing all essential nutrients except pantothenic acid. The presence of pantothenic acid, both in standards and samples, gives a pantothenic acid-dependent growth response of <i>Lactobacillus plantarum</i> during incubation at 37°C. After incubation, the growth of <i>Lactobacillus plantarum</i> is measured turbidmetrically with a spectrophotometer. A dose response curve of absorbance versus concentration [µg/L] is generated using the known concentrations of the standard solutions. The concentration of pantothenic acid present in each sample is determined directly from this curve.