Vitamin B12 Absorption

Vitamin B12 also known as cyanocobalamin is a complex vitamin containing the mineral cobalt. The primary functions of this member of the B vitamin family, which is closely related to another B vitamin, folate, are the synthesis of DNA preventing microcytic anemia and maintaining healthy nervous tissue.

To absorb vitamin B12 the vitamin must first be released from the protein to which it is attached in foods. This first step occurs in the stomach with the help of hydrochloric acid and the enzyme pepsin. Once released, vitamin B12 binds with a molecule called R protein that is produced in the salivary glands and present in the mass of chewed food mixed with the saliva.

The R protein B12 complex moves into the small intestine where pancreatic enzymes release the vitamin B12 from its complex. The freed vitamin B12 quickly binds with another protein called intrinsic factor synthesized in the stomach. Once the complex is formed it travels to the lower portion of the small intestine called the ileum where the intrinsic factor binds to a receptor site on the brush border.

The vitamin B12 is gradually absorbed across the intestinal cell membrane where it is transported attached to a specific protein called transcobalamin II. This complex of protein and vitamin B12 travels through the portal vein to the liver where it later enters the bloodstream to be utilized by the bone marrow and the red blood cells. Thus, the absorbed B12 is not ready to participate in DNA synthesis and maintaining healthy red blood cells and nervous tissue.

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