

# Vitamin B-6 Liquid

Vitamin B6, Zinc, and Magnesium  
Cofactor Blend



By David M. Brady, ND, DACBN, IFMCP, FACN and Amy Berger, MS, CNS

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Designs for Health's Vitamin B-6 Liquid provides concentrated vitamin B6 in a delicious raspberry flavored liquid. Vitamin B6 occurs naturally in several forms, but specific ones are needed by the body for particular functions. This product is formulated with vitamin B6 as pyridoxine HCl, a precursor to pyridoxal-5-phosphate (P5P), which is the most bioactive form of this essential water-soluble nutrient. This product also includes magnesium and zinc, both of which serve as ubiquitous cofactors in the body and are needed, along with vitamin B6 for multiple metabolic conversions to occur. Each serving (1 teaspoon) is formulated to provide 50 mg of vitamin B6, 30 mg of magnesium bisglycinate chelate, and 5 mg of zinc bisglycinate chelate in a convenient liquid delivery that is ideal for situations in which higher doses are warranted and/or for individuals who prefer a liquid form rather than softgels or capsules. The liquid delivery is also suitable for patients who have difficulty swallowing pills, such as children and the elderly.

## Highlights

- 50 mg of stabilized vitamin B6 liquid
- Chelated forms of magnesium and zinc for enhanced absorption and bioavailability
- Convenient liquid delivery allowing for easy titration and for individuals who have difficulty swallowing capsules and softgels
- Delicious raspberry flavor for increased patient compliance
- No artificial sweeteners or flavors

Overt vitamin B6 deficiency is rare, but as many as 16% of the U.S. adult population may be living with some degree of insufficiency.<sup>1</sup> Considering the numerous roles for this nutrient, suboptimal vitamin B6 status may manifest with any number of conditions that affect physical, mental, and emotional health.

## Required Cofactor for a Wide Range of Enzymes

Vitamin B6 is needed for more than 160 enzymatic reactions that catalyze a wide range of biochemical processes throughout the body.<sup>2</sup> It is needed for aromatic L-amino acid decarboxylase, which converts levodopa (L-DOPA) to dopamine and 5-hydroxytryptophan (5-HTP) to serotonin. Vitamin B6 is also a required cofactor in the synthesis of other neurotransmitters, including glycine, glutamate, gamma-aminobutyric acid (GABA), and histamine.<sup>3</sup> This vitamin also contributes to the synthesis of body tissues made from collagen. Vitamin B6 supports the integrity of skin, blood vessels, and other collagenous tissues, as it is a cofactor for lysyl oxidase, which promotes the cross-linking of collagen and elastin.<sup>4</sup>

In addition, vitamin B6 is required for enzymes involved in one-carbon metabolism, including the conversion of tetrahydrofolate (THF) to 5,10-methylene-THF, which serves as a methyl donor in the synthesis of nucleic acids.<sup>3</sup> Vitamin B6 is a cofactor for delta-6-desaturase, an enzyme needed for converting the "parent" omega-6 (n-6) and omega-3 (n-3) fatty acids (linoleic acid and alpha-linolenic acid, respectively) into longer-chain n-6 and n-3 fats, such as gamma-linolenic acid (GLA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA), which serve as precursors or building blocks for mediators involved in a healthy inflammatory response.<sup>5</sup> This crucial vitamin also plays a role in the maintenance of healthy glucose metabolism. It is a cofactor in glycogen phosphorylase enzymes, which cleave glycogen into glucose, along with enzymes involved in gluconeogenesis.<sup>3,6</sup> Adequate vitamin B6 status or supplementation may help contribute to cardiovascular health by facilitating the well-functioning homocysteine pathway and by supporting healthy blood pressure.<sup>7</sup>

## Benefits\*

- Helps support neurotransmitter synthesis
- May help promote balanced mood and positive mental outlook
- Promotes the maintenance of healthy blood sugar metabolism
- Helps support myelin formation
- May help support healthy homocysteine metabolism
- May promote blood vessel, skin, and collagenous tissue integrity
- Supports cellular energy metabolism
- May help attenuate premenstrual symptoms
- Helps support hemoglobin synthesis, healthy red blood cell function, and oxygen transport
- May help support a healthy inflammatory response
- May support cardiovascular health

## Supplement Facts

Serving Size 5 mL (approx. 1 teaspoon)  
Servings Per Container about 24

Amount Per Serving		% Daily Value
Calories	15	
Total Carbohydrate	3 g	1%*
Vitamin B-6 (as Pyridoxine HCl)	50 mg	2941%
Magnesium (as TRAACS® Magnesium Bisglycinate Chelate Taste Free)	30 mg	7%
Zinc (as Zinc Bisglycinate Chelate)	5 mg	45%

\*Percent Daily Values are based on a 2,000 calorie diet.

**Other Ingredients:** Glycerine, purified water, citric acid, natural flavor, β-carotene (color).

## Rationale for Supplementation

Vitamin B6 occurs in food as pyridoxine (primarily in plant foods), and also as pyridoxamine and pyridoxal, which are the two most abundant forms in animals and humans.<sup>8</sup> Pyridoxine and pyridoxamine are converted to active pyridoxal phosphate (PLP), which is the major form of circulating vitamin B6 in the body. Vitamin B6 is abundant in both plant and animal foods, but as with many nutrients, various circumstances may increase the body's need for it that is greater than what could reasonably be obtained from diet alone. For example, the use of certain medications may interfere with the absorption of vitamin B6 from foods, potentially leading to an increased need for supplementation. Among these are oral contraceptives and non-steroidal anti-inflammatory drugs (NSAIDs). Smoking or alcohol dependence may also increase the need for vitamin B6, as these populations tend to have lower PLP levels.<sup>8</sup> Individuals with low intake of animal foods (i.e., vegans and vegetarians) may wish to supplement with vitamin B6, as the naturally occurring pyridoxine in grains, vegetables, and fruits has reduced bioavailability.<sup>8</sup> In addition, individuals who may be at increased risk for vitamin B6 deficiency are those who have malabsorption syndromes, such as celiac disease, Crohn's disease, or ulcerative colitis, along with individuals who have undergone bariatric surgery.<sup>6,8</sup>

## Potential Clinical Roles for Vitamin B6 Supplementation

Animal models and cell culture studies suggest that vitamin B6 deficiency may increase the risk for type 2 diabetes and certain cancers.<sup>2,9</sup> Individuals with type 2 diabetes often show reduced blood levels of vitamin B6.<sup>10</sup> In addition, vitamin B6 is necessary for the conversion of the amino acid tryptophan into niacin and nicotinamide adenine dinucleotide. Inadequate vitamin B6 may result in tryptophan being shunted toward synthesis of kynurenine, which may inhibit insulin secretion and negatively impact glucose tolerance.<sup>11</sup> Researchers have speculated that interference with tryptophan metabolism resulting in buildup of kynurenine and its metabolites may explain the link between depression and the subsequent development of type 2 diabetes, as well as contribute to the etiology of type 2 diabetes that is not associated with depression.<sup>12,13</sup> Increased kynurenine and its metabolites have also been observed in cardiovascular disease.<sup>14</sup> Ischemic heart disease and coronary artery disease may respond favorably to vitamin B6 supplementation.<sup>15-17</sup>

In vitro and animal research demonstrates that administration of vitamin B6 inhibits the formation of advanced glycation end products, which are believed to be major contributors to the microvascular and macrovascular blood vessel damage responsible for many diabetic complications, such as nephropathy, retinopathy, and cardiovascular disease.<sup>10,18,19</sup> Rodent models of diabetes showed that administration of high doses of vitamin B6 reduced progression of nephropathy and inhibited development of retinopathy and neuropathy.<sup>18-20</sup>

Plasma levels of PLP are reduced with inflammatory conditions, such as rheumatoid arthritis and irritable bowel syndrome.<sup>21,22</sup> Both the estimated vitamin B6 intake and the plasma levels of PLP are inversely associated with a risk for colorectal cancer, and those with irritable bowel diseases are at increased risk for colorectal cancer.<sup>23,24</sup>

Vitamin B6 supplementation may be effective for helping to reduce symptoms of premenstrual syndrome (PMS), particularly when combined with magnesium.<sup>25</sup> By itself, magnesium supplementation has been shown to improve PMS symptoms; adding vitamin B6 has been shown to result in further improvements.<sup>26</sup> Vitamin B6 may be especially beneficial for addressing the occasional depression and low mood associated with PMS.<sup>27</sup> In a small study of university students, supplementation with vitamin B6, as pyridoxine, was shown to significantly reduce moodiness, depression, irritability, fatigue, sugar cravings, increased appetite, breast tenderness, bloating, and other PMS symptoms.<sup>27</sup> Hyperemesis gravidarum (nausea and vomiting during pregnancy) is another women's health concern that may respond favorably to vitamin B6 supplementation.<sup>28,29</sup>

**Recommended Use:** Take 5 mL (approximately 1 teaspoon) per day or as directed by your health-care practitioner.

Does not contain gluten, dairy, soy, or GMOs.

*For a list of references cited in this document, please visit:*

<https://www.designsforhealth.com/techsheet-references/vitamin-b-6-liquid-references.pdf>

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