



## Methyl Factors

Serving Size 1 mL  
Servings Per Container 59

Amount Per Serving

Vitamin B6 (as pyridoxal-5-phosphate)	2 mg
Folate (as [6S]-5-methyl-tetrahydrofolic acid [glucosamine salt] and 5-formyltetrahydrofolate [calcium folinate])	400 mcg
Vitamin B12 (as methylcobalamin)	1000 mcg

**OTHER INGREDIENTS:** Water, glycerin, xylitol, natural flavors, xanthan gum, citric acid, grape skin extract, sodium hexametaphosphate, potassium sorbate (to ensure freshness), sodium benzoate and stevia leaf extract.

**SUGGESTED USE:** As a dietary supplement, take one serving (1 mL) one time per day or as directed by your healthcare professional. Shake before use.

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# METHYL FACTORS

A UNIQUE LIQUID FORMULA OF DIETARY METHYLATION COFACTORS

- Supports optimal homocysteine levels for cardiovascular health\*
- Helps maintain proper neurological function\*
- Nutritional support for normal erythropoiesis\*

**METHYL FACTORS** provides therapeutic doses of vitamins B6, B12, and folate in a highly absorbable liquid formula. These essential B vitamins support proper endogenous methylation activity as well as healthy production of red blood cells, neurotransmitters, hormones, and nucleic acids. The compound homocysteine occurs as a byproduct of the series of B12/B6/folate-dependent methylation reactions involved in methionine/cysteine metabolism. Elevated levels of homocysteine have been associated with cardiovascular risk through believed promotion of atherosclerotic plaque development and enhanced blood clotting activity. In clinical trials, supplementation with the involved B vitamins has been shown to reduce circulating homocysteine levels and therefore support cardiovascular health.\*

**FOLATE (FOLIC ACID)** is provided as a combination of 5-methyltetrahydrofolate (5-MeTHF) and 5-formyltetrahydrofolate (calcium folinate). Although, folic acid is the most oxidized and stable form of folate and is commonly used as a dietary supplement, it is not the metabolically active form. Folic acid must be reduced and methylated to 5-MeTHF to become the metabolically active form found in blood and utilized by tissues. Research has shown a subset of individuals with MTHFR polymorphism do not efficiently convert folic acid to the active 5-MeTHF due to genetic enzyme deficiencies. It is important to remember that 5-MeTHF is a form of the methyl group donor required for the conversion of homocysteine to methionine, which is catalyzed by vitamin B12-dependent methionine synthase. Without sufficient 5-MeTHF, regeneration of methionine cannot occur, resulting in possible homocystenemia.\*

# METHYL FACTORS

## REFERENCES:

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3. Guo H, Chi J, Xing Y, Wang P. Influence of folic acid on plasma homocysteine levels & arterial endothelial function in patients with unstable angina. *Indian J Med.* 2009 Mar;129(3):279-84.
4. Hodis HN, Mack WJ, Dustin L, Mahrer PR, Azen SP, Detrano R, Selhub J, Alaupovic P, Liu CR, Liu CH, Hwang J, Wilcox AG, Selzer RH; BVAIT Research Group. High-dose B vitamin supplementation and progression of subclinical atherosclerosis: a randomized controlled trial. *Stroke.* 2009 Mar;40(3):730-6. Epub 2008 Dec 31.
5. Kim JM, Stewart R, Kim SW, Yang SJ, Shin IS, Yoon JS. Predictive value of folate, vitamin B12 and homocysteine levels in late-life depression. *Br J Psychiatry.* 2008 Apr;192(4):268-74.
6. Setola E, et al. Insulin resistance and endothelial function are improved after folate and vitamin B12 therapy in patients with metabolic syndrome: relationship between homocysteine levels and hyperinsulinemia. *Eur J Endocrinol.* 2004 Oct;151(4):483-9.
7. Tiemeier H. Vitamin B12, folate, and homocysteine in depression: the Rotterdam Study. *Am J Psychiatry.* 2002 Dec;159(12):2099-101.

**VITAMIN B6 (PYRIDOXAL 5'-PHOSPHATE)** is a water-soluble vitamin that participates in over 100 body reactions. The phosphate ester derivative pyridoxal 5'-phosphate (PLP) is the principle coenzyme form and is a cofactor for endogenous transaminase activity. PLP-dependent reactions include the synthesis of both serotonin and the catecholamines and the production of hemoglobin, steroid hormones, and nucleic acids. Vitamin B6 deficiency has been linked to emotional abnormalities, carpal tunnel, low immunity, and premenstrual syndrome. Conversion of homocysteine to the amino acid cysteine requires two PLP-dependent reactions. This pathway facilitates the *de novo* synthesis of cysteine from methionine and also provides an alternative pathway for the breakdown of homocysteine.\*

**VITAMIN B12 (METHYLCOBALAMIN)** is a coenzyme involved in nucleic acid metabolism, red blood cell synthesis, methyl transfer, and myelin synthesis and repair. Absorption of vitamin B12 is dependent upon gastric secretion of the glycoprotein intrinsic factor. Among aging adults, secretion of intrinsic factor is often reduced, leading to an increased risk of vitamin B12 deficiency and the related pernicious anemia. The liquid form of B12 in Methyl Factors allows patients to bypass the intrinsic factor-dependent pathway for enhanced absorption. Vitamin B12 deficiency is also common among strict vegans and those who have undergone long-term treatment with certain antibiotics. Long-term insufficient intake of vitamin B12 can lead to megaloblastic anemia, impaired folate metabolism, and many neurological disorders including depression, paresthesias, and memory loss. Remethylation of homocysteine to methionine also requires the methylcobalamin form of B12.\*

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