

INNATE

RESPONSE FORMULAS®

Folate, B6 & B12

V i s m e d i c a t r i x n a t u r a e

Product Rationale
Written by Stacey Gillespie, B.Sc.

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FOLATE, B6 & B12 RATIONALE

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When crafting all Innate Response Formulas[®], our mission is to harness the innate healing response that is within every patient in the time honored traditions of "*vis medicatrix naturae*". Following this time honored tradition we will only use the finest nutrient-rich whole foods and botanicals that are aligned with these principals.

For every Innate Response Formula[™] it is our primary goal that each will provide:

1. 100% Whole food vitamins and minerals delivered in our proprietary FoodState[®] food concentrates. Whole food vitamins and minerals are not in an isolated state, but rather, exist within a biodynamic FoodState[®] whole food concentrate. FoodState[®] concentrates not only deliver essential nutrients, but numerous other vital constituents including bioactive peptides, enzymes, food compounds and macronutrients that inherently comprise whole food. Each nutrient is present in a balanced ratio and in a potency equivalent to the amount found in foods.

2. All of the macronutrients and vital food constituents including bioactive peptides, enzymes, lipids and synergistic compounds that are inherently present in whole foods are also delivered with each vitamin and mineral. These constituents have irreplaceable roles as co-factors in key metabolic bodily functions, and as bio-carriers that govern nutrient delivery to the cells.

Folate, vitamin B6 and vitamin B12 have critical roles in:

- The prevention of neural tube defects during pregnancy and maintenance of myelin sheath of the central nervous system.
- The formation of red blood cells and hemoglobin.
- Making of new cells and cell replication.
- The production of ATP.
- Managing homocysteine metabolism and concentration regulation.
- Acting as cofactors in several biological reactions in the body.

As research continues to validate the importance of these three vitamins and how inter-related their function is in the body, supplementation of all three is increasingly more important to sustain optimal health and metabolic function in the body. Supplementation is particularly important during pre-conception and pregnancy; in treatment of megaloblastic anemia and in managing cardiovascular health.

Contraindications/Interactions: It is suggested, individuals taking anticonvulsant drugs should not take folic acid supplements as they may increase the risk of seizures. Folic acid and anticonvulsant drugs compete for absorption across the epithelial cells and the brain cell wall [8]. Medications including methotrexate, trimethoprim, phenytoin and sulfasalazine interfere with folate metabolism and may cause functional folate deficiencies.

Recommended Usage: The recommended dosage is 1-2 servings per day, unless directed otherwise. Dietary modifications in addition to supplementation are recommended for long-term results. Additional factors such as a family history of heart disease, smoking, alcoholism and a sedentary lifestyle may also influence the risk of elevated homocysteine levels. Suggested to be taken in conjunction with Cardio Response[™] and/or Cholesterol Response[™] as well as Innate's Prenatal formulas.

Formula Rationale

Although this formula has many clinical applications it was crafted specifically to help facilitate the body's innate ability to maintain healthy homocysteine levels. Several studies have shown that the supplementation of vitamins folate, B6 and B12 to be very effective in lowering homocysteine to healthy levels in the bloodstream. Homocysteine is produced as a normal byproduct of the breakdown of the amino acid methionine, which is acquired primarily from eating meat and other proteins.

Elevated homocysteine levels are typically caused from a dietary imbalance often caused by a diet with excessive animal protein sources and inadequate levels of B vitamins or by a genetic disorder which results in an accumulation of homocysteine in the body.

Moderate levels of homocysteine are helpful for the growth and maintenance of healthy tissue. With a proper nutritional balance, homocysteine is either converted back into methionine or into other simple amino acids (cysteine and cystathionine) both of which are easily flushed from the body via the urine. However, when homocysteine levels are in excess due to either genetic or dietary factors, it invades the bloodstream and can cause damage to epithelial cells that line blood vessels. This damage can cause the build up of fibrous plaques and excess smooth muscle cells in the vessel walls, creating an undesirable narrowing of the arteries. These fibrous plaques can also attract fat and cholesterol found in the bloodstream, causing fatty deposits and further blockage [1]. Studies have demonstrated that supplementation of the vitamins folate, B12 and B6 to be effective in normalizing blood homocysteine levels [6,7] and thus decrease a risk factor for heart disease [2]. At least ten percent of coronary heart disease cases in the US may be caused by hyperhomocysteinaemia [1].

The inclusion of beet root extract was chosen because of the beneficial compound betaine it provides. Betaine from dietary sources or from choline metabolism (dependent on folate, B12 and B6) in the body has also been shown to be effective in converting homocysteine to methionine. This conversion can occur without the presence of methylcobalamin (B12) [3] and therefore is helpful in individuals on a strict vegetarian diet, excessively consume alcoholic beverages, or have parasitic infections. Betaine is known to be particularly effective in managing the genetic disorder homocystinuria that causes homocysteine levels to accumulate in the body.

Additional Nutritional Applications

In addition, to an increased risk of cardiovascular disease, recent research has indicated that high homocysteine levels in the body to be directly associated with neurotoxic effects [4] and an increased risk of early onset of generalized osteoporosis [5].

The brain has a high demand for SAMe and choline, both are produced by methylation reactions involving folate, B6 and B12. These nutrients as methylation factors and donors are involved in the production of neurotransmitters and in the maintenance of the myelin sheath. Therefore, when the body stores of these nutrients and of betaine are depleted, brain health may also be affected.

A recent study published in the NEMJ found increased circulating levels of homocysteine levels may be a considerable, independent risk factor for osteoporotic fractures in older men and women. The researchers concluded an elevated homocysteine level appears to be a significant, isolated risk factor for osteoporotic fractures in elderly men and women [5].

Supplementation of folate, B6 & B12 is suggested to help manage a decline in mental health in addition to help maintain long-term bone health.

Why Folate, B6 & B12

As research continues to determine the effects of increased homocysteine levels, the importance of supplementing with Folate, B6 & B12 has been researched. Several peer-reviewed studies have suggested folate supplementation to be effective in lowering homocysteine levels [6,7]. Since folate's biological actions are directly linked to the availability of vitamins B6 and B12, it is recommended that a supplement that delivers all three of these nutrients be selected for helping to maintain homocysteine levels without disrupting methylation reactions in the body.

Folate, B6 and B12 work synergistically together, as methylation factors in a variety of biological reactions in the human body. Methylation is the biochemical process in which certain molecules transfer or donate a methyl group (-CH₃) to other molecules. This donation on the one carbon molecule comes from other larger molecules, called methyl donors. Methylation occurs in every cell of the body and insufficient levels of any one of these three essential vitamins will affect many bodily functions including S-adenosylmethionine (SAMe) production, cell division and blood metabolism.

Whole Food Folate, B6 & B12 Forms

The folate, B6 & B12 vitamins delivered in this formula are 100% whole food vitamins. As whole food vitamins they are the biological active form found in the human body and in food. Supplementing with a whole food form of folate (pteroylmonoglutamate derivatives), is increasingly important as research continues to challenge the safety of taking the common synthetic form of folic acid, pteroylmonoglutamic acid (PGA). This oxidized compound is the pharmaceutical form of folic acid and is not normally found as such in foods or in the human body in significant concentrations [8], yet is the form primarily used in supplementation and food fortification.

The consumption of synthetic PGA, is known to interfere with folate metabolism over a period of years [8,9]. This is caused by the body's inability to fully metabolize the oxidized form, PGA into the active form, methylfolate which results in an abundance of oxidized PGA circulating in the body. Unmetabolized levels of PGA have been linked to interfering with folate dependent enzymes [8,9] and inhibiting nucleotide biosynthesis [10] which in turn counteracts the intended benefit of folate supplementation.

In a recent clinical review of the safety of long term supplementation and fortification of synthetic PGA, the author strongly suggested that the long term consequences of supplementing and fortifying food of synthetic PGA continued to be assessed due to observed biological consequences in folate metabolism [9] and other enzymatic reactions. Based on his review of published studies and literature concerning folic acid, the author stated, "we should also be assessing supplementation with isomer specific native folates that represent the natural food forms of the vitamins." [9].

Folate, B6 & B12 is FREE of synthetically "pure" vitamins and minerals, GMOs, preservatives, binders, pesticides and herbicides.

References:

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