



# THE SCIENCE BEHIND VITALITY FOR MEN™

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More than Just Your Average  
Multivitamin

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## THE SCIENCE BEHIND VITALITY FOR MEN™

It is quite simple to keep track of macronutrients and modify the diet to adapt different macronutrient composition. However, the micronutrients are not as simple to control. With 13 essential vitamins and 16 essential minerals, all coming from different food sources, it becomes quite vexing to ensure they are all covered, even with the healthiest of diets. In order to obtain all the desired nutrients required by the body, the diet is required to contain a wide array of foods that highly varies from day to day. Not only does the average person not consume a highly variable diet from a wide array of natural healthy foods, the micronutrient content of those foods can vary as well. Therefore, it's nearly impossible to ensure that all the micronutrient needs are being met in your standard diet.

Athletes in particular, demand more from their micronutrients than their nonathletic counterparts. More enzymatic reactions, fuel catabolism, cellular signaling, anti-oxidation and tissue anabolism, creates the added turnover of molecular structures, enzymes and tissues that require various micronutrients for their replacements.

Vitamins and minerals are the 'behind the scenes' nutrients that optimize human function without your knowledge. Specific micronutrients dictate how you feel, how you sleep, how you function day to day, how your body heals, how your body repairs, how your body processes the food you eat and converts it to usable energy. Deficiencies in any of these micronutrients can develop over time and linger for years completely undetected, and you may not even recognize the performance detriments, poor sleep quality, or even a lack of daily energy as a micronutrient issue.

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### YOU SHOULD KNOW

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For those who are looking to achieve the pinnacle of their abilities day and night, topping up on all the essential nutrients with Vitality For Men™ will do just that. Made especially for men that lift, who like to stick to a strict diet, or may not have the variety necessary to get the full complement of each nutrient. 1 simple serving of Vitality For Men™ helps you get what you need without compromising your diet routines.

## B-VITAMINS

The B-vitamins are water soluble vitamins that are used in a variety of enzymes and coenzymes responsible for fuel metabolism. Deficiencies in B-vitamins can impair your energy availability and provide a fatiguing sensation.

**Vitamin B1**, also known as thiamin, is used in the creation of the coenzyme called thiamine pyrophosphate (TPP). TPP participates in carbohydrate metabolism performing several critical steps in liberating energy from carbohydrates including the conversion of pyruvate to acetyl-CoA.

**Vitamin B2**, also known as riboflavin, is used in flavoproteins such as FAD and FADH. They are energy transferring derivatives of carbohydrate, fat and protein metabolism produced in the mitochondria and produce cellular energy. Vitamin B2 is required to produce vitamin A and vitamins B3 and B6.

**Vitamin B3**, also known as niacin, is a component of nicotinamide adenine dinucleotide (NAD). NAD is the companion to FAD that performs similar energy transferring reactions in the liberation of energy from fuel. Healthy NAD levels are imperative for normal liberation of energy from fuels.

**Vitamin B5**, also known as pantothenic acid, is involved in more than a hundred different steps in the synthesis of lipids, neurotransmitters, steroid hormones, and hemoglobin. In regards to energy metabolism, it serves as part of the coenzyme-A (CoA), a central hub of fuel oxidation.

**Vitamin B6**, also known as pyridoxine, is required for the production of pyridoxal 5'-phosphate (PLP) and serves as a coenzyme for hundreds of enzyme reactions and energy metabolism. PLP is also a cofactor in the biosynthesis of neurotransmitters, serotonin dopamine epinephrine, norepinephrine and GABA. It's required for the liberation of glucose from muscle glycogen.

**Vitamin B7**, is also known as biotin. Deficiency in biotin is associated with brittle and thin fingernails, hair loss, conjunctivitis, dermatitis and some neurological symptoms. Therefore, supplementing with biotin will help preserve and maintain those areas. Biotin is also critical to maintain metabolism during low glycolytic flux. It is imperative the breakdown of certain fatty acids and amino acids along with their conversion of glucose via gluconeogenesis.

**Vitamin B9**, also known as folic acid, is used in the formation of tetrahydrofolate (TH4). This folate derivative participates in the biosynthesis of both purines and pyrimidines to form DNA. This is particularly important for muscle hypertrophy. It also is required in the formation of GMP and AMP, both energy-signaling molecules. TH4 is also required for the activation of vitamin B12.

**Vitamin B12**, also known as cobalamin, serves as a coenzyme in several enzymatic reactions in every cell in the human body. It participates in DNA synthesis, and in fatty acid and amino acid metabolism. It is particularly important in the normal functioning of the nervous system via its role in synthesizing myelin. It is also important in the maturation of blood cells. B12 does not exist in any vegetable sources so vegans particularly should consider getting their B12 from a supplement.

**Vitamin C**, also known as ascorbic acid is an essential nutrient involved in several functions. It is indispensable in tissue repair, the production of neurotransmitters, immune system support, and also acts as an antioxidant. Specifically, it performs numerous physiological functions in the human body by serving as an enzyme substrate, cofactor, or electron donor. It's most notable for its role in the synthesis of collagen. Failure to produce collagen is the pathophysiology of scurvy. Collagen is essential to wound healing, tissue repair, development and maintenance of blood vessels and cartilage. In regards to neurotransmitters, vitamin C functions as a cofactor in the production of norepinephrine from dopamine. As an antioxidant, it plays a significant role in the reduction of free radicals and preserves cellular integrity with the inhibition of oxidative stress.



**Rob Riches**

Blue Star Nutraceuticals® Athlete

## FAT SOLUBLE VITAMINS

**Vitamin A**, comes from the pro-vitamin called beta-carotene and participates in protein synthesis and cell differentiation, thereby maintaining the health of epithelial tissues such as your linings of your mouth, stomach, intestines, lungs, urinary bladder, urethra, and skin. It's most notable for its requirement for good vision. Vitamin A is needed in the form of retinol to form a protein called rhodopsin which is imperative for low-light and color vision. It also participates in sperm development and bone remodeling.

**Vitamin D**, assists in bone growth and maintenance through a cooperative network including Vitamins A, C, K, calcium, phosphorus, magnesium and fluoride. Vitamin D specifically has a role in maintaining blood concentrations of calcium and phosphorus. Bones grow denser and stronger as they absorb and deposit these minerals. This is essential for men who lift heavy and want to avoid injury. Vitamin D also plays a role in the brain, nervous system, pancreas, skin, muscles, cartilage, reproductive organs, and cancer cells. These discoveries suggest that vitamin D has numerous functions and may be valuable injury prevention, immune health, and sleep quality.

**Vitamin E**, also known as tocopherol, is an antioxidant and one of the body's primary defenders against the adverse effects of free radicals. Very high intensity exercise produces large amounts of free radicals that need to be quickly resolved. Chronic exposure to free radicals can cause oxidative cellular damage. Vitamin E protects the vulnerable components of the cells and their membranes from destruction, most notably the oxidation of polyunsaturated fatty acids and other lipids and related compounds. Accumulating evidence suggests that vitamin E may reduce the risk of heart disease by protecting LDLs against oxidation. Oxidation of LDL has been implicated as a key factor in the development of heart disease. This is very important for athletes who put a lot of stress on their hearts.

## MINERALS

**Chromium** participates in carbohydrate and lipid metabolism, by improving insulin sensitivity. This is important for athletes who eat with high frequency. Frequent meals cause insulin levels to rise several times a day. Chronic exposure to insulin can decrease your insulin sensitivity. Chromium supplementation can help keep metabolic health in check.

**Copper** serves as a constituent of several enzymes. The copper-containing enzymes have diverse metabolic roles. It aids in hemoglobin and myoglobin synthesis, defends against free radicals and helps to manufacture collagen and heal wounds. It is also needed in many of the metabolic reactions related to the release of energy.

**Iodine** is converted to iodide in the GI tract. Iodide is an integral part of the thyroid hormone that regulates body temperatures, metabolic rate, reproduction, growth, blood cell production, nerve and muscle function and more. Of importance, iodide influences your basal metabolism. Iodine is indispensable to life.



**Iron** is essential and vital to many of the cells' activities. However, those who choose chicken over red meat, or are not eating red meat in large quantities are probably not getting all your dietary iron like millions of Americans. Iron serves as a cofactor to enzymes involved in oxidation-reduction reactions and is involved in oxidative phosphorylation via the electron transport chain. However, the major role that iron plays is in carrying oxygen to muscles through the bloodstream as well as holding onto oxygen while in the muscle. This has huge implications for energy metabolism and exercise performance. Those who lack iron will simply not perform up to their potential. Additionally, those who train particularly hard have increased red blood cell production, which requires an increase in hemoglobin production, which requires iron. This is the same for muscle hypertrophy training. Increased muscle size requires an increase in myoglobin production, which also requires iron. Finally, iron is a great companion to Vitamin C in regards to its role in collagen production. It is important to note that calcium interferes with Iron absorption, which is why you won't find calcium in Vitality for Men.™

**Magnesium** acts in all the cells of the soft tissues, where it forms part of the protein-making machinery and is necessary for energy metabolism. It participates in hundreds of enzyme systems. A major role is as a catalyst in the reaction that produces ATP. As a required component for ATP metabolism, magnesium is essential to the body's use of glucose, the synthesis of protein, fat, and nucleic acids, and the cells' membrane transport system. Magnesium is also involved in muscle contraction and blood clotting. This helps regulate blood pressure and the functioning of the lungs. Magnesium also helps prevent dental caries by holding calcium in tooth enamel. Lastly, it supports the normal functioning of the immune

system. With so many functions, this is something you don't want to be without. The majority of your body's magnesium exists in your bones. Therefore, when your body needs magnesium for any of its many functions it breaks down bone tissue to get it. Having adequate magnesium added to your diet can help preserve your bone mass while still maintaining the full spectrum of its effects.

**Manganese** is another element that is required as a cofactor for several enzymes in the body including macronutrient metabolism, bone formation, and free radical defense.

**Molybdenum** is a cofactor for several enzymes. Molybdenum affects protein synthesis metabolism, and growth. Those who are deficient in molybdenum have poorly functioning sulfite oxidase enzymes and are prone to toxic reactions to sulfites in foods.

**Selenium** is essential to the body's antioxidant defense as part of glutathione peroxidase, selenium works in concert with vitamin E to prevent free radical formation. Selenium is also involved in the conversion of thyroid hormones to its active form.

**Zinc** is a versatile trace element required as a cofactor by more than 100 enzymes. Virtually all cells contain zinc, but the highest concentrations are in muscle and bone. Tissues do not readily give up their zinc when blood levels fall, so a person, particularly athletes with great muscle and/or bone mass, must consume zinc-rich foods. Zinc stabilizes cell membranes, helping to strengthen their defense against free radical attacks. Zinc also assists in immune function and in growth and development. Zinc participates in the synthesis, storage, and release of insulin in the pancreas. Zinc interacts with platelets in blood clotting, affects thyroid hormone function and influences behavior and learning performance. Its pairing with vitamin A is ideal since it is needed to produce the active form of vitamin A into retinol. It is essential to wound healing and the making of sperm.

### **Sensoril®**

The final ingredient in Vitality For Men™ is a proprietary, multi-patented, standardized extract of Ashwagandha called Sensoril®. Sensoril® helps provide a healthy, long lasting energy alternative to stimulant-based quick fixes. Ashwagandha is a plant grown in India that is revered for its ability to balance, rejuvenate, and revitalize. Due to the persistent side effects associated with caffeine and stimulant-based energy such as short term energy spikes that may result in jitteriness, heart palpitations, and sleeplessness, as well as a post spike crash, there is an increasing demand for sustained energy and relief from fatigue derived from non-stimulant sources. Ashwagandha also possesses stress reducing properties that help promote emotional uplift as well as an enhanced mood, and is particularly effective when taken as a tonic on a daily basis. The body rarely becomes habituated to Ashwagandha's effects so increased dosage is not necessary over the long term to produce a sustained effect.

Sensoril's energy-boosting, mood-enhancing benefits were demonstrated in a double blind, placebo-controlled human clinical trial. Subjects taking 125 mg of Sensoril® experienced a 53% reduction in fatigue coupled with increased energy. The Sensoril® group also saw improvements in mood coupled with reductions in stress, anxiety, irritability, inability to concentrate, and forgetfulness. In contrast, these factors were unchanged in the placebo group throughout the study.

Other health benefits include its ability to lower cortisol levels (14.5%); a hormone associated with the body's response to stress. Research has shown that reductions in cortisol are not only associated with reduced stress and an enhanced mood, but also sleep. Stress may result in difficulty falling and staying asleep. Stress often leads to sleep issues. Sensoril® is clinically tested to help enhance sleep by reducing serum cortisol levels. By lowering serum cortisol levels, Sensoril® may establish a healthy circadian rhythm and more restful sleep for those who encounter daily stressors. 125 mg of Sensoril® a day is associated with a 71% reduction in sleeplessness.

## CONCLUSION

Amidst the hype of macronutrients, the micronutrients tend to get left in the dust. Despite their magnitude, they are omnipresent and each one plays a vastly important role in your overall well-being. With the lack of awareness of each of the micronutrients, it's unlikely to be aware of what level each of them is in your body. If these micronutrients are not accounted for properly, you can expect detriments in sleep quality, energy levels, tissue repair, and immunity to name a few. Taking a multivitamin is a first line of defense against vitamin deficiency. Vitality For Men™ is formulated specifically for men that lift, who have an extra demand for certain vitamins along with a patented ashwagandha extract to tie everything together with a scientifically-backed, mood-enhancing energy booster.



**Rob Riches**

Blue Star Nutraceuticals® Athlete



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Dr. David Gundermann is an award winning nutritional product development scientist, clinical researcher, and known expert in muscle health and metabolism. He developed his passion for health & fitness at a very early age growing up in a family of accomplished competitive athletes.

As Director of Research and Development at Blue Star Nutraceuticals®, he leads all efforts concerning product formulation, key ingredient research, flavor science, long-term scientific assessment, and proprietary development.

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