

# MICRONUTRIENTS *for* ATHLETES



Because micronutrient status directly impacts performance and energy production, athletes benefit from regular monitoring of micronutrient status to optimize **competitive advantage** during training and events.

Athletes should consider that micronutrients also play an important role in:

- energy production
- hemoglobin synthesis (for optimal oxygen levels)
- maintenance of bone health
- adequate immune function
- protection of body against oxidative damage
- recovery and muscle growth after strenuous training and injuries

Exercise stresses many of the metabolic pathways where micronutrients are required, and intense physical training may result in muscle biochemical adaptations that increase micronutrient needs. Routine exercise may also increase the turnover and loss of these micronutrients from the body. As a result, greater intakes of micronutrients may be required to cover increased needs for building, repair, and maintenance of **lean body mass** in athletes.

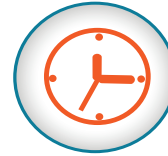




Athletes at **higher risk** for poor micronutrient status include those who:

- restrict energy intake (calories) long-term
- have severe weight-loss practices
- eliminate one or more food groups from their diet
- consume unbalanced and low micronutrient-dense diets

These athletes may benefit from a Vibrant Micronutrient test to assess micronutrient balance and deficiencies.



### Muscle Recovery

The B-complex vitamins have two major functions directly related to exercise. Thiamin, riboflavin, niacin, pyridoxine (B6), pantothenic acid, and biotin are involved in energy production during exercise, whereas folate and vitamin B12 are required for the production of red blood cells, for protein synthesis, and in tissue repair and maintenance including the central nervous system.

Deficiency of vitamin B12, folate, or both may result in anemia and reduced endurance performance. Decreases in cardiorespiratory function, muscle strength, and endurance have been noted with poor zinc status.

### Antioxidants

The antioxidant nutrients, vitamins C and E,  $\beta$ -carotene, and selenium, play important roles in protecting cell membranes from oxidative damage. Because exercise can increase oxygen consumption by 10- to 15-fold, long-term exercise produces a constant "oxidative stress" on muscles and other cells leading to lipid peroxidation of cell membranes.

It is important to have a balanced antioxidant intake from diet to optimize antioxidant capacity in the body.

### Omega Fatty Acids

Studies show omega-3 fats can improve lung capacity, reaction time and mood in athletes. In addition, muscle soreness is decreased in those with higher omega-3 Index values.

Omega-3 fats also have powerful pain reducing effects in other tissues besides muscle. DHA, an omega-3 fatty acid, assists in concussion protection by stimulating growth of healthy neuronal tissue in response to injury.

## VIBRANT TEST

#### • Vitamins

Vitamin A	Vitamin C
Vitamin B1	Vitamin D,25-OH
Vitamin B2	Vitamin D3
Vitamin B3	Vitamin E
Vitamin B5	Vitamin K1
Vitamin B6	Vitamin K2
Vitamin B12	Folate

#### • Minerals

Calcium  
Chromium  
Copper  
Iron  
Manganese  
Magnesium  
Zinc

#### • Metabolites

Choline  
Inositol  
Carnitine  
MMA  
(Methylmalonic acid)

#### • Antioxidants

Coenzyme Q10  
Cysteine  
Selenium  
Glutathione

#### • Amino Acids

Asparagine  
Glutamine  
Serine

#### • Electrolytes

Sodium  
Potassium

#### • Intracellular (RBC)

RBC Folate    RBC Magnesium    RBC Iron    RBC Omega fatty acids

#### • Intracellular (WBC)

### References:

- [1] Med Sci Sports Exerc. *Joint Position Statement: nutrition and athletic performance.* American College of Sports Medicine, American Dietetic Association, and Dietitians of Canada. 2000 Dec;32(12):2130-45. <https://www.ncbi.nlm.nih.gov/pubmed/111288622>.  
 [2] Rodriguez, N.R., PhD, RD, CSSD, FACSM; DiMarco, N.M., PhD, RD, CSSD, FACSM; Langley, S., MS, RD, CSSD. *Nutrition and Athletic Performance*. [https://www.medscape.com/viewarticle/717046\\_8](https://www.medscape.com/viewarticle/717046_8)  
 [3] Volpe, SL. *Clin Sports Med. Micronutrient requirements for athletes.* 2007 Jan;26(1):119-30. <https://www.ncbi.nlm.nih.gov/pubmed/17241918>

### Regulatory Statement:

These tests have been laboratory developed and their performance characteristics determined by Vibrant America, a CLIA-certified laboratory performing the test. This test has not been cleared or approved by the U.S. Food and Drug Administration (FDA). Although FDA does not currently clear or approve laboratory-developed tests in the U.S., certification of the laboratory is required under CLIA to ensure the quality and validity of the tests. All information in this material is to be used solely for informational and educational purposes only and are not intended to constitute or to be a substitute for professional medical advice, diagnosis, or treatment. Patients should always seek the advice of a physician or other healthcare professional before making any changes to their lifestyle or medications.

🏠 1021 Howard Ave, Ste.B, San Carlos, CA 94070

📞 1-866-364-0963

@ support@vibrant-america.com

🌐 www.vibrant-america.com



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