

**75% of Runners are Vitamin D Deficient.  
Are You Getting Enough and How Can it Affect Your Training?**  
*by Emily Brown*

Vitamin D is an important component of a runner's diet and recent research on the vitamin has concluded that it may be more significant for overall health than initially realized.

According to a March 2009 study in the Archives of Internal Medicine, more than three-quarters of adults are Vitamin D deficient. Furthermore, a 2008 study at the Cooper Clinic in Dallas found that 75 percent of runners averaging 20 miles a week have low vitamin D levels.

As a result, the recommended daily intake for vitamin D has increased in recent years, particularly for runners. Athletes should pay special attention to meeting these new requirements for vitamin D.



In this article, I am going to outline why Vitamin D is important for your overall health and your performance as a runner. More importantly, I will provide daily recommendations as well as healthy sources to supplement your diet should you be falling short of the daily recommendation.

**The Importance of Vitamin D for Runners**

Vitamin D is best known for its role in maintaining bone health. It helps the body absorb calcium from food and supplements and helps maintain calcium homeostasis. If you suffer from chronic stress fractures, Vitamin D can be one of the supplements that decrease your risk of future stress fractures.

From a training perspective, a number of new studies show Vitamin D's may provide significant performance benefits.

One study, published in February 2009 in The Journal of Clinical Endocrinology & Metabolism, concludes that adolescents with higher levels of vitamin D can jump higher, quicker, and with greater power than those with lower vitamin D levels.

A review in Molecular Aspects of Medicine in December 2008 shows that vitamin D increases the size of fast-twitch muscles and muscular strength.

Some research also shows low levels of vitamin D may increase risk for sports injuries, including stress fractures because the nutrient is so vital for bone health.

In addition, vitamin D plays a key role in a number of processes that are important for optimal athletic performance:

- **Muscle contraction**- vitamin D is required for the activation of certain enzymes involved in muscle stimulation
- **Nerve stimulation**- vitamin D is necessary for the nerves to carry messages between the brain and other parts of the body
- **Immune system**- vitamin D helps activate and mediate the body's immune function
- **Improved anti-inflammatory response**- vitamin D plays a role in inhibiting proteins that trigger and inflammatory response in individuals with chronic inflammatory diseases (such as asthma and arthritis)

There are two bone conditions that can result from chronic deficiency of vitamin D: rickets in children and osteomalacia in adults. Even if dietary intake of calcium and phosphorous is adequate for bone health, sufficient vitamin D is necessary to absorb these minerals and without it, bone density and growth can be severely impacted.

### **How Much Vitamin D Do I Need?**

The following are the newest recommendations for daily intake of vitamin D (issued by the Institute of Medicine in November 2010):

- Children and Adults <70 years old: 600 IU (15 micrograms) per day
- Adults 70 or older: 800 IU (20 micrograms per day)
- Upper Limit (maximum safe intake): 4,000 IU (100 micrograms) per day

If you are afraid you are low in vitamin D, you can have your vitamin D status tested by measuring blood levels of 25-hydroxyvitamin D through a regular blood test performed by your doctor. He or she should then be able to determine if you are deficient, or at risk of becoming deficient, and recommend the proper supplement or dietary protocol. Typically, these blood tests are inexpensive (ranging between \$30-\$50) and can be combined with your iron.

### **Where Can I Get Vitamin D?**

Vitamin D is unique in that it can be obtained from foods but can also be synthesized by our own bodies through exposure to sunlight.

Vitamin D is one of four fat-soluble vitamins (A, D, E, and K) meaning that it needs adequate dietary fat to be absorbed. Therefore, fat-containing foods are often good sources of vitamin D.

The following are some examples:

- Fatty fish like salmon, tuna, catfish, sardines and mackerel; also fish liver oil
- Mushrooms that have been exposed to ultraviolet light
- Smaller amounts in foods like egg yolks and cheese
- Fortified foods like milk, yogurt, breakfast cereals, orange juice and margarine (be sure to check the nutrition labels)

As mentioned previously, we can also synthesize vitamin D from exposure to sunlight. Normally 15 minutes of exposure for light-skinned individuals and 30 minutes for dark-skinned individuals is sufficient to meet daily needs for vitamin D. However, there are some limitations:

- Indoor sun exposure (i.e. through the window) will not produce vitamin D. Furthermore, exposure is limited on cloudy days and when in the shade.
- Overexposure of the skin to UV rays increases the risk for skin cancer. It is widely recommended to wear sunscreen to protect from skin cancer, but sunscreen also reduces the body's ability to synthesize vitamin D from sunlight.
- In the late fall and into the winter, the days become shorter and exposure to sunlight is further limited by cold weather and more clothing being worn when outside. Individuals living in the northern states are particularly at risk for insufficient vitamin D.

A final way to get vitamin D is through supplements. Vitamin D supplements can be found either on their own or combined with another product, usually calcium. Supplements are usually found in one of two forms: D<sub>2</sub> (ergocalciferol) or D<sub>3</sub> (cholecalciferol). D<sub>3</sub> is the natural form of vitamin D that the body makes from sunlight and therefore is the more recommended form of vitamin D supplements, however both forms are sufficient at increasing vitamin D in the blood.

### **Final Notes on Vitamin D**

It should be noted that it is possible to have too much vitamin D. It is highly unlikely to get too much vitamin D from food or sunlight; therefore vitamin D overdose is almost always associated with supplementation. Although vitamin D supplementation may be recommended, it is important to adhere to the recommendations and not exceed 4,000 IU (100 micrograms) per day for healthy adults.

Signs of vitamin D toxicity are often associated with increased blood levels of calcium and include: Nausea, vomiting, poor appetite, weight loss, constipation, weakness, confusion, disorientation, and problems with heart rhythm.

Too much of any good thing is a bad thing. Therefore it is important to maintain a healthy overall diet and only take supplements as recommended. Remember that many foods are already fortified with vitamins and minerals and many supplements contain more than one product. Be sure to check all of your supplement labels for vitamin and mineral overlaps to prevent overdosing.

### **Resources:**

NIH Office of Dietary Supplements, Vitamin D: <http://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional>

Aranow, C. Vitamin D and the immune system. *J Investig Med*. 2011;59(6):881-886.

National Jewish Health. "How vitamin D inhibits inflammation." *ScienceDaily*, 23 Feb. 2012. Web. 1 Nov. 2012.