

Vitamin D and the Body

Vitamin D is a fat-soluble vitamin which helps support bone health, muscle function, cell growth and immunity.

Vitamin D is obtained in three ways:

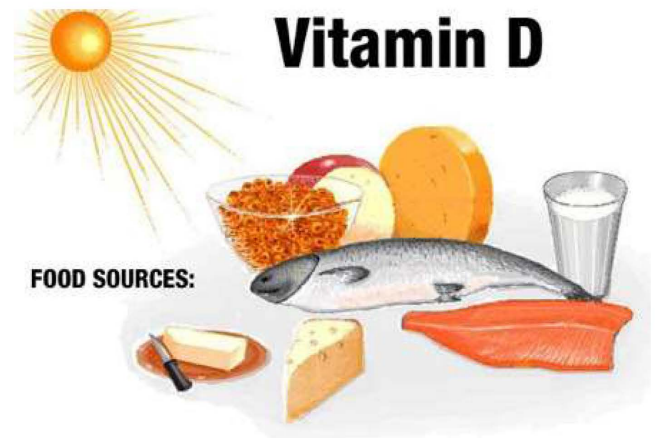
1. Exposure to ultraviolet (UV) light
2. Consuming vitamin D-containing foods
3. Ingestion of supplemental vitamin D

Risk Factors for Poor Vitamin D Status:

- ▶ Indoor sport or winter sport
- ▶ Dark or extremely fair skin
- ▶ Living and training at northern latitudes
- ▶ Sunscreen use
- ▶ Limited sun exposure
- ▶ Low dietary vitamin D intake
- ▶ Low or high body fat levels

Importance of Vitamin D on Performance

- ▶ Sufficient levels are needed to maintain bone health and aid in injury repair
- ▶ Vitamin D helps enhance the ability of muscle to make quick, explosive movements
- ▶ Adequate vitamin D allows the body to fight off common upper respiratory infections
- ▶ Vitamin D status may positively effect velocity and jump height



Assessment of Vitamin D Status

- Status varies seasonally
- In the blood, **25 hydroxy vitamin D3** or 25(OH)D should be assessed
- At the end of the summer (or early fall) and winter months are the best time to assess
- Baseline testing is justified at any time of the year, especially if low status is suspected

Symptoms of Vitamin D Deficiency in Athletes

- ▶ Low bone density
- ▶ Stress fractures
- ▶ Fatigue
- ▶ Unexplained muscle and joint pain
- ▶ Frequent illness

How Much Vitamin D is Enough?

Institute of Medicine Recommends:

Individuals 14-50 years old = 600 IU/day

Dietary sources of vitamin D are important to support vitamin D status; however, it is challenging to meet daily needs with dietary sources alone. Dietary needs are much higher to restore status if blood levels are low.

Keep in mind, dietary supplementation may be necessary in addition to food sources to improve status. Dietary supplementation should only be undertaken with the guidance of a health professional.

Vitamin D in Training Meals and Snacks

Food sources of vitamin D	IU
Wild salmon - 3.5 oz.....	981
Sun dried mushrooms - 1 oz.....	400-500
Cod liver oil - 1 tsp.....	400
Mackerel - 3.5 oz.....	388
Canned sardines - 3.5 oz.....	270
Farmed salmon - 3.5 oz.....	249
Ahi Tuna - 3.5 oz.....	164
Fortified milk - 8 oz.....	100
Soy milk, fortified - 8 oz.....	100
Orange juice, fortified - 8 oz.....	100
Cod - 3.5 oz.....	80
Cereals, fortified - amount varies.....	40-100
Egg yolk - 1.....	25-40

Sun exposure can be an important contributing source to build vitamin D stores. On average, the skin can synthesize about 10,000-20,000 IU of vitamin D in less than 30 minutes of exposure to the face and arms without using sunscreen.

The amount of vitamin D synthesized from sun exposure depends on the individual. Furthermore, these factors decrease an athlete's ability to synthesize vitamin D as effectively:

- Living in northern latitude
- Winter season
- Day light outside 10:00am-2:00pm
- Darker skin color
- Clothing that covers large body areas
- Sunscreen use
- Body fat

If you have a history of skin cancer and melanoma, unprotected sun exposure is not recommended.

Simple Ways to Improve Vitamin D Status

- ▶ Include vitamin D-rich fish in 2-3 meals per week
- ▶ Pair 1-2 hard-boiled eggs with fortified cereal and orange juice for a vitamin D-rich breakfast
- ▶ Add raw UV exposed mushrooms to salads
- ▶ Add fortified milk to fruit smoothies, overnight oats, coffee or just a drink on its own
- ▶ Aim for 5-30 minutes of sun exposure per day (without sunscreen) to help increase vitamin D stores; allow sunlight to reach arms, legs, and trunk for greatest benefit

Athlete Recommendations: