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. Consuming vitamin D-containing foods
2. Exposure to ultraviolet (UV) light
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

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 may be suspected

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 often caused by a high volume of training at high intensities
- Vitamin D status may positively effect velocity and jump height

Symptoms of Vitamin D Deficiency in Athletes:
- Low bone mass
- 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, recommended by a health professional, may be necessary in addition to food sources to improve status.

### Vitamin D in Training Meals and Snacks

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

**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
- Top pasta, rice or quinoa with mushrooms
- Grill up salmon burgers for dinner and add leftovers to salads and tacos throughout the week
- Add fortified milk to fruit smoothies for a snack
- Aim for 5-30 minutes of sun exposure per day (without sunscreen) to help build up vitamin D stores; allow sunlight to reach arms, legs and trunk for greatest benefit
- If you have a history of skin cancer and melanoma, unprotected sun exposure is contraindicated