

## Resources

More information on Vitamin D, disease prevention, supplementation, and other related topics can be found online at:

NIH, Office of Dietary Supplement  
[www.ods.od.nih.gov](http://www.ods.od.nih.gov)

USDA MyPyramid  
[www.mypyramid.gov](http://www.mypyramid.gov)

American Dietetic Association  
[www.eatright.org](http://www.eatright.org)

Vitamin D Council  
[www.vitamindcouncil.org](http://www.vitamindcouncil.org)

For references cited, please visit:  
[www.simmons.edu/hygieneandhealth/Vitamin%20D%20references.pdf](http://www.simmons.edu/hygieneandhealth/Vitamin%20D%20references.pdf)

\* Recommended by the American Academy of Pediatrics.  
<http://cme.medscape.com/viewarticle/581999>



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## Vitamin D The Sunshine Vitamin



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## Background

Vitamin D is a fat-soluble vitamin that functions as a hormone in the human body. The role of vitamin D in the body is primarily to help build and maintain healthy bones. Vitamin D also helps regulate calcium and phosphorus levels in the blood. There are two main forms of vitamin D, D2 (ergocalciferol) and D3 (cholecalciferol). Vitamin D3 can be made in the body through skin exposure to sunlight's ultraviolet radiation (UVR) or taken in through diet or supplementation. Vitamin D3 is the active form of the vitamin in the body. Vitamin D2 is more common in vegetarian food sources but is 25-30% less potent than D3.

Vitamin D is known as the “sunshine vitamin” because sunlight exposure activates vitamin D synthesis in the body. Generally, 10-15 minutes of sun exposure to the face, hands, back or arms 2-3 times a week will provide adequate vitamin D production. Latitude, season, skin color, and age can alter the skin's production of vitamin D. Aging significantly decreases the capacity of skin to create vitamin D. Individuals > 50 years old have a higher risk of developing a deficiency. Northeastern sunlight from mid-October to mid-March does not provide significant vitamin D synthesis. Supplementation during this time is recommended.



Sunscreens, SPF of 8 or greater, block the UV rays that produce vitamin D. Make sure to use sunscreen, especially during the summer months, if you are going to be exposed to the sun longer than 10-15 minutes to protect skin from harmful effects of the sun.

## Benefits of Vitamin D

The potential benefits include:

- Improve and strengthen bone mass by increasing absorption of calcium

- Reduced risk of autoimmune diseases including type 2 Diabetes, Multiple Sclerosis, Rheumatoid Arthritis and Osteoarthritis
- Reduced risk of periodontal (gum) disease
- Reduced risk of prostate, colon, ovarian and breast cancer

## Recommended Intake

Adequate Intake levels (AI) for vitamin D represent daily intake levels that will maintain bone health and prevent deficiency in healthy people.

Adequate Intake (AI) of vitamin D for males and females:

- Infant - 50 years = 400 IU/day\*
- Adults 51-70 years= 400 IU/day
- Adults > 70 years = 600 IU/day

## Who is at risk for deficiency?

Up to 40% of Americans are deficient in vitamin D.

Risk factors for deficiency include:

- Living in the north during the winter months of November to February
- Dark skin pigmentation
- Overweight (BMI > 30)
- Adults > 50 years old
- Exclusively breastfed infants
- Chronic kidney or liver disease
- Lactose intolerance
- Fat malabsorption
- Vegetarian diet

## Deficiency:

Vitamin D deficiency causes abnormalities in calcium absorption and bone development and density. In children, deficiency causes rickets (failure of bone to mineralize). In adults deficiency leads to defects in the skeleton causing osteoporosis.

Ask your doctor to check your blood levels of vitamin D, 25(OH)D. The optimal blood level for vitamin D, 25(OH)D is 32-40ng/ml. This will let you know if you are deficient or at risk.

## Toxicity

Although vitamin D toxicity is rare, it is often associated with high supplemental intake. Vitamin D toxicity can lead to high blood levels of calcium, heart rhythm abnormalities, and kidney stones. Vitamin D toxicity is unlikely to occur through dietary intake or sun exposure.

The tolerable upper limit (UL) of vitamin D for adults >18 years is 2,000 IU/day (~50mcg/day)

## Sources:

Only a few foods are naturally rich in vitamin D including salmon, herring, catfish, tuna fish and eggs. Fortified foods provide Americans with their primary dietary sources of vitamin D. The average amount of vitamin D in popular fortified products:

- 1 cup of milk or OJ – 100 IU
- soy milk – 100 to 120 IU
- breakfast cereal – 40 to 80 IU
- yogurt – 40 IU
- Viactiv calcium soft chews – 200 IU
- Multivitamins – 400 IU



Dietary supplements may be used to ensure adequate daily intake. Research shows that a therapeutic intake of vitamin D is 1000 IU/day, this level has been shown to have the highest connection with disease prevention. It is important to read nutrition fact labels of supplements to determine the source of vitamin D because vitamin D3 is preferable as it is better utilized in the body.