

VITAMIN D FACTS

Low vitamin D levels can lead to a number of inflammatory conditions, such as heart disease, cancer, diabetes, neurological problems, and autoimmune diseases. In addition, vitamin D deficiency is associated with musculoskeletal aches, low back pain, and osteoporosis! Although a major source of vitamin D production in our bodies is exposure to the sun, the research below cites why we are recommending 2,000 to 4,000 IU of vitamin D supplementation during the sunny months.

IN THE DIET

The diet most humans consume today contain minimal vitamin D, unless the person eats large amounts of wild-caught fatty fish, sun-dried shiitake mushrooms, or wild reindeer meat. Fortified foods, such as some milk, orange juice, and cereals, contain small amounts of vitamin D, but these sources are minor contributors to vitamin D stores. The vitamin D system in our human ancestors began in the skin, not in the mouth. Vitamin D normally enters the circulation after UVB from sunlight strikes 7-dehydrocholesterol in the skin, converting it to vitamin D₃, or cholecalciferol. When taken by mouth, the body metabolizes vitamin D similarly to when it is generated in the skin.

No matter how it arrives in the circulation, the liver readily converts vitamin D to 25(OH)D, the form our bodies need and use.

IN THE AIR—THE SUN

Properly applied sunblock, common window glass in homes and cars, and clothing all effectively block UVB radiation, even in the summer. Those who avoid sunlight—at any latitude—are at risk of vitamin D deficiency any time of the year. For example, a surprisingly high incidence of vitamin D deficiency exists in Miami, Florida, despite its sunny weather and subtropical latitude.¹

Getting 10 to 15 minutes of unprotected sun exposure (no sunblock, with most of your body exposed, if possible) between 10 am and 2 pm is the easiest way to obtain sufficient levels of vitamin D. This short amount of time will help your body naturally produce up to 15,000 international units (IU) of vitamin D.

RACE, AGE, AND WEIGHT

African-Americans, the elderly, and the obese face added risk of vitamin D deficiency. Because melanin in the skin acts as an effective and ever-present sunscreen, dark-skinned people need much longer UVB exposure to generate the same 25(OH)D stores as fair-skinned individuals.² Older people make much less vitamin D than, for example, 20-year-olds after exposure to the same amount of sunlight.³ Body fat absorbs vitamin D; thus, obesity is a major risk factor for deficiency, with obese African-Americans at an even higher risk.⁴

Anyone who works indoors, lives at higher latitudes, regularly uses sunblock, has dark skin, is obese, is older, or who consciously avoids the sun is at high risk for vitamin D deficiency.

NURSING MOTHERS, INFANTS, AND TODDLERS

One group of researchers recommends that parents supplement breast-fed infants with at least 800 IU of vitamin D daily, while formula-fed infants need 400 IU per day. Infants and toddlers may be at extremely high risk of deficiency during weaning; around 12 to 18 months, many stop drinking vitamin D-fortified infant formula. Young children who do not get regular (unprotected) sun exposure should take 1,000 to 2,000 IU of vitamin D daily, year-round, depending

QUICK NOTES

- Nearly everyone has a chronic vitamin D deficiency. Sunscreen with an SPF of 8 can reduce vitamin D production by 95%.
- Vitamin D is not readily available in the diet, even in fortified foods.
- Vitamin D is necessary for proper calcium absorption, and it can reduce musculoskeletal and low back pain.
- The current recommended daily allowance (RDA) of a few hundred IUs is out of date and inaccurate. The accepted upper level of vitamin D is now 10,000 IU/day. A typical US diet contains less than 100 IU/day.
- As we age, we require higher levels of vitamin D. Men and those who weigh more require higher levels.
- There are two types of vitamin D supplements: cholecalciferol and ergocalciferol.

on body weight. Keep in mind that current Food and Nutrition Board recommendations state that doses of up to 2,000 IU per day are safe for children over the age of one.

WHAT LEVELS ARE ADEQUATE?

Neither the regular consumption of officially recommended amounts of vitamin D (eg, 400 IU in a multivitamin) nor the regular consumption of vitamin D-fortified foods (eg, 100 IU per 8-oz. glass of milk) effectively prevent vitamin D deficiency.^{5,6} Furthermore, 2,000 IU/day for one year failed to achieve a 32 ng/mL target 25(OH)D concentration in 40% of 104 African-American women studied.⁷ In another study, middle-aged people received 4,000 IU of vitamin D per day for more than six months, resulting in average 25(OH)D levels of 44 ng/mL, with no side-effects other than improved mood.⁸ One researcher estimates that 3,000 IU/day is required to ensure that 97% of Americans obtain levels greater than 35 ng/mL.⁹ Healthy adult men utilize up to 5,000 IU of vitamin D per day, if it is available in their bodies. In general, the more a patient weighs, the more vitamin D will be required, and large amounts of body fat further increase the requirements.¹⁰

Main Source

Cannell, Hollis. Use of vitamin D in clinical practice. In: *Alternative Medicine Review*. 2008;13(1).

Additional References

1. Levis, Gomez, Jimenez, et al. Vitamin D deficiency and seasonal variation in an adult South Florida population. *J Clin Endocrinol Metab*. 2005;90:1557-62.
2. Willis, Laing, Hall, et al. A prospective analysis of plasma 25 hydroxyvitamin D concentrations in white and black prepubertal females in the S.E. U.S. *Am J Clin Nutr*. 2007;85:124-30.
3. Hollick. Vitamin D—New horizons for the 21st century. *Am J Clin Nutr*. 1994;60:619-30.
4. Yanoff, Parikh, Spitalnik, et al. the prevalence of hypovitaminosis D and secondary hyperparathyroidism in obese black Americans. *Clin Endocrinol (Oxford)*. 2006;64:523-29.
5. Vieth, Cole, Hawker, et al. Wintertime vitamin D insufficiency is common in young Canadian women, and their vitamin D intake does not prevent it. *Eur J Clin Nutr*. 2001;55:1092-97.
6. Brot, Vestergaard, Kolthoff, et al. Vitamin D status and its adequacy in healthy Danish perimenopausal women. *Br J Nutr*. 2001;86:S97-S103.
7. Aloia, Talwar, Pollack, et al. Randomized controlled trial of vitamin D3 supplementation in African American women. *Arch Intern Med*. 2005;165:1618-23.
8. Vieth, Kimball, Hu, et al. Randomized comparison of the effects of the vitamin D3 adequate intake versus 100 mcg (4000 IU) per day on biochemical responses and the wellbeing of patients. *Nutr J*. 2004;3:8.
9. Heaney. The vitamin D requirement in health and disease. *J Steroid Biochem Mol Biol*. 2005;97:13-19.
10. Wortsman, Matsuoka, Chen, et al. Decreased bioavailability of vitamin D in obesity. *Am J Clin Nutr*. 2000;72:690-93.

