



Nutrition Nuggets



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Is the “Sunshine Vitamin” a Cure-all?

Part 1

Vitamin D is best known for its role in building strong teeth and bones, but overwhelming evidence in recent years shows it to be powerfully protective against a multitude of ills, from the common cold to many forms of degenerative disease and even our brain function such as the ability to plan, organize and think abstractly. It is now estimated that one billion people worldwide are deficient in this essential nutrient, largely due to insufficient sun exposure.

Amazingly, our skin is able to produce vitamin D from a cholesterol-like precursor under the influence of ultraviolet (UV) rays. The resulting steroid vitamin is converted by chemical reactions in the liver and kidneys into an incredibly versatile hormone called calcitriol.

Vitamin D is involved in some way in practically every cell, tissue and organ system in the body. Knowing that, it's not surprising that low levels can result in such wide ranging health problems as have been revealed through numerous clinical and population studies.

Besides its well known functions of helping the body absorb and regulate calcium and phosphorus, vitamin D is a key player in the regulation of cell growth, immune response, insulin sensitivity and energy metabolism. This fat-soluble vitamin is stored in our body fat. Excess fatty tissue reduces its circulation so those who are obese are at increased risk for deficiency.

SOLAR POWER

Sunlight is the largest single source of vitamin D for most people. However, those who live above 40 degrees north latitude – north of Philadelphia or Denver for example, are mostly deficient. This is primarily due to two factors - reduced solar rays and the fact that it's too cold at least half the year to go outdoors without being completely covered.

The quantity of vitamin D created from sun exposure depends on skin color, intensity of ultraviolet radiation, and amount of skin exposed over time. Complete cloud cover reduces UV energy by 50 percent. Shade or severe pollution reduces it by 60 percent. UVB rays are not able to penetrate glass, so exposure to sunlight from inside a window will not generate vitamin D synthesis.

Dark skin can require as much as four times the amount of sun exposure to produce a unit of vitamin D as the lightest skin. Sunscreen with skin protection factor (SPF) of 8 reduces production of vitamin D by 95 percent.

Widespread use of sunscreen to protect against skin cancer is one reason for the decline of average blood levels of vitamin D since 1994.

For a fair skinned individual, 10 to 15 minutes of bright sun exposure on arms and legs two to three times a week is sufficient to satisfy requirements. Light skin can manufacture as many as 10,000 to 12,000 international units (IU) of vitamin D from 30 minutes of sunlight. Although excess solar vitamin D manufactured during warm months can be stored in body fat and later released for use during winter, few people spend enough time outdoors to accumulate sufficient stores, especially in northern latitudes.

With age, our skin's ability to produce vitamin D drops significantly. Adults 65 or older make only 25 percent as much as individuals in their 20s. At the same time, intestinal absorption from foods and supplements decreases markedly.

One study of vitamin D found it to be more effective than light therapy on seasonal affective disorder (SAD), which is common in northern latitudes. Further research is needed to confirm findings.

DIETARY SOURCES

Without significant sun exposure, we are apt to be deficient as there are not many good food sources in nature. The biological activity of 40 International Units is equivalent to 1 microgram (mcg).

Natural Sources

Canned pink salmon, 3 oz - 320 IU
Herring, 3 oz - 700 IU
Pickled herring, 3 oz - 570 IU
Sardines, 3 oz - 240 IU
Tuna canned in oil, 3 oz - 200 IU
Mackerel, 3 oz - 300 IU
Halibut, 3 oz - 500 IU
Cod Liver Oil, 1 tsp - 450 IU
Shitake mushrooms, 4 - 250 IU

Since fortified milk is the primary dietary source in the U.S., those who are lactose intolerant tend to be most deficient. Fortification of milk began in the 1940s to counter the public health problem of rickets. Rickets is now a rare disease in our nation, though it still exists in small numbers, mainly among African American infants and children.

Fortified Foods

Cow's milk, 8 oz - 100 IU
Rice milk, 8 oz - 100 IU
Soy milk, 8 oz - 100 IU
Orange juice, fortified - 100 IU per 8 oz
Danimals yogurt, 4 oz - 40 IU
Cereal, fortified - 40 IU per serving

SUPPLEMENTATION

Today, a high incidence of vitamin D insufficiency is found in almost all populations and nearly 50 percent of Americans are estimated to have subnormal levels of calcitriol. Other high-risk groups include people with dark skin, seniors, the obese, and individuals with malabsorption syndromes.

Scientists agree that a blood calcitriol level of 75 nmol/l (30 ng/ml) is the minimum standard for optimal health. Those who are not exposing their skin to bright sunlight at least two to three times a week are rarely able to achieve this without supplements.

The amount of vitamin D recommended for adults by the Food and Nutrition Board of the National Academies in Washington, D.C. is 200 to 400 IU daily. A growing consensus exists among physicians and nutrition professionals in favor of raising the recommended dosage to between 1000 and 2000 IU.

Earlier this year, the International Osteoporosis Foundation released a position paper on vitamin D, recommending as many as 2000 IU per day. Leading author Professor Bess Dawson-Hughes of Tufts University stated, "Global vitamin D status shows widespread insufficiency and deficiency. This high prevalence of suboptimal levels raises the possibility that many falls and fractures can be prevented with vitamin D supplementation."

Recent research from the Cleveland Clinic found the vitamin is most easily absorbed when it's taken as part of the largest meal of the day. Additionally, since it's a fat-soluble vitamin, consuming it with a meal that contains some fat or oil enhances absorption. Since most American meals are relatively high in fat content, a large meal would very rarely be fat-free.

INTERACTIONS WITH MEDICATIONS

Steroids

Medications such as prednisone and other corticosteroid drugs, often prescribed to reduce inflammation, can reduce calcium absorption and interfere with the body's ability to use vitamin D.

Other medications

The weight-loss drug, orlistat, marketed as Xenical and Alli, as well as the cholesterol-lowering drug, cholestyramine, sold as Questran, LoCholest, and Prevalite, can all reduce intestinal absorption of fat-soluble vitamins.

The anti-seizure medications phenobarbital and phenytoin (Dilantin) speed up the body's usage of vitamin D while simultaneously reducing calcium absorption.

Vitamin D supplements may be harmful for those taking calcium channel blockers and cardiac glycosides (digoxin), as drug effects may be increased. Those taking digoxin could experience abnormal heart rhythms.

Vitamin D supplementation may create elevated blood levels of calcium in patients with hypoparathyroidism who are on thiazide diuretics.

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