



# Vita D 1000IU

The Sunshine Vitamin

*In the future, man will use the sunshine element of plants to regenerate and heal the human body.*  
~George Crile, M.D.

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## Vitamin D – The History

Vitamin D may be the “oldest” pro-hormone on the planet, synthesized by a micro-organism which is estimated to have lived in the ocean 750 million years ago. Approximately 150 years ago, it was recognized that people, especially children, who worked and lived in urban areas with little light were especially susceptible to rickets, a softening of the bones leading to fractures and deformity. The predominate cause of rickets is a deficiency of vitamin D.

As early as 1849, cod liver oil was used in the treatment of tuberculosis (TB). We now know that the vitamin D in cod liver oil activates the immune system cells that can fight TB. In 1970, Adolf Windaus, a German scientist, was awarded the Nobel Prize for his synthesis of vitamin D by replicating the photoactivation process that occurs in the skin.

In the 1930s, the U.S Federal Government began recommending to parents, especially those in the Northeast, that they send their children outside to play in order to increase vitamin D levels. In addition, milk was fortified with vitamin D.

Today we know that vitamin D has many critical metabolic functions, yet much of the population is still at risk of deficiency. It is estimated that at least 30%, and as much as 80%, of the US population is deficient in vitamin D. In the latitudes north of Atlanta, Georgia (USA), the skin does not photo-convert any vitamin D from November through March. During this season, the angle of the sun is too low to allow ultraviolet B light to penetrate the atmosphere. Instead, it is absorbed by the ozone layer. In late Spring, Summer, and early Fall, most vitamin D is synthesized by the skin between 10 am and 3 pm when UVB from the sun penetrates the atmosphere and reaches the earth's surface.

## Vitamin D – The Chemistry

Vitamin D exists in several forms, however, the primary forms of vitamin D are D2 (ergocalciferol) and D3 (calciferol), which is more than three times as effective as D2 in raising serum concentrations of vitamin D. These are known collectively as calciferol.

Vitamin D is a fat-soluble vitamin derived from the diet, or synthesized in the body after exposure to ultraviolet rays from the sun. Vitamin D is also referred to as a pro-hormone, meaning that it has no hormone activity itself, but is converted to the active hormone 1,25-D through a tightly regulated synthesis mechanism. The liver and kidney help convert vitamin D to its active hormone form.

## The Importance of Sun Exposure

Vitamin D is produced by a phyto-reaction of exposure to ultraviolet B light from the sun (wavelength 270-300 nm, with peak synthesis occurring between 295-297 nm). These wavelengths are present in sunlight when the UV index is greater than 3. This solar

elevation occurs daily within the tropics, daily during the spring and summer seasons in temperate regions, and almost never within the arctic circles. Sufficient amounts of vitamin D3 can be made in the skin after only ten to fifteen minutes of adequate sun exposure to the face, arms, hands, or back (without sunscreen) at least two times per week. With longer exposure to UVB rays, an equilibrium is achieved in the skin, and the vitamin simply degrades as fast as it is generated.

Even dietary sources of vitamin D are ultimately derived from organisms, from mushrooms to animals, which are not able to synthesize it except through the action of sunlight at some point. For example, fish contain vitamin D only because they ultimately exist on a diet of ocean algae which synthesize vitamin D in shallow waters from the action of solar UV.

## Activation of Vitamin D

Once present in the body, vitamin D is transported to the liver where it is hydroxylated to form 25-hydroxyvitamin D[25(OH)D], the major circulating form of vitamin D and currently, the most useful indicator of your vitamin D nutritional status. This form of vitamin D has a half life of about 3 weeks and must be converted to the more active 1,25- (OH)2D for utilization the body.

In the kidney, the 25(OH)D is further catalyzed, resulting in the formation of 1,25- (OH)2D, the most potent form of vitamin D. Most of the physiological effects of vitamin D in the body are related to the activity of 1,25- (OH)2D. 1,25- (OH)2D is highly active metabolically and its levels are tightly controlled. Plasma concentrations are mainly dependent on renal function, appropriate parathyroid hormone levels, and the supply of calcium and phosphate. The blood levels of this metabolite decline only after vitamin D depletion is virtually complete.

## Vitamin D and Cancer†

Between 2006 & 2008, researchers at the University of California, San Diego (UCSD) and the Department of Family and Preventive Medicine, using data available on worldwide cancer incidence, have shown a clear association between deficiency in exposure to sunlight, specifically (UVB), and breast cancer, kidney cancer, lung cancer, ovarian cancer, and endometrial cancer.

The International Journal of Cancer (June 2008) identified vitamin D's anti-oxidant activity in prostate cells. Researchers believe that this antioxidant activity may be part of the reason for vitamin D's anti-cancer activity. More than 1000 laboratory and epidemiological studies have been published concerning the association between vitamin D and its metabolites and cancer.

Long-term studies have demonstrated the efficacy of moderate intake of vitamin D in reducing cancer risk and, when administered with calcium, in reducing the incidence of fractures.

Benefits of Vitamin D3<sup>†</sup>

**Maintains Calcium Balance** for normal functioning of the nervous system, bone growth, and maintenance of bone density.

**Aids Cell Differentiation.** Vitamin D is known to regulate cell proliferation and gene expression in a variety of epithelial cells.

**Boosts Your Immunity.** The active form of vitamin D (1,25- (OH)2D) has been shown to inhibit the development of autoimmune diseases, including inflammatory bowel disease (IBD).

**Modulates Insulin Secretion.** Vitamin D plays a role in insulin secretion under conditions of increased insulin demand.

**Decreases risk of Cardio Vascular Disease.** Moderate D deficiency plus high blood pressure has been shown to nearly double the risk of myocardial infarction, stroke and heart failure. (Framingham Heart Study). Adequate vitamin D levels may be important for decreasing the risk of high blood pressure.

Vitamin D and Bone Health<sup>†</sup>

Probably the most important effect of vitamin D is to facilitate absorption of calcium from the small intestine and the re-sorption of calcium within the kidney, minimizing the loss of calcium in the urine. Vitamin D also enhances fluxes of calcium out of bone.

Vitamin D does this in concert with parathyroid hormone.

Because of its important regulatory role, a vitamin D deficiency can contribute to the bone weakening diseases of osteomalacia and osteoporosis.

Health Consequences Associated with Vitamin D Deficiency<sup>†</sup>

Bone disorders, Joint Disorders, Muscular weakness, Cardiovascular disorders, Psychoneurological disorders, Endocrine disorders, Polycystic ovary syndrome, Inflammatory bowel disease, Periodontal disease, Irritable Bowel Disease, Crohn's, Ulcerative Colitis, Heart Disease, Hypertension, Arthritis, Chronic Pain, Depression, Inflammatory Bowel Disease, Obesity, Premenstrual Syndrome, Fibromyalgia, Crohns Disease, Multiple Sclerosis, Autoimmune Illness, and Cancer.

Adequate calcium and vitamin D throughout life, as part of a well balanced diet, may reduce the risk of osteoporosis

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Optimal Levels of Vitamin D3<sup>†</sup>

Daily Intake	Associated Effects
100 IU	Prevents rickets, nutritional disease. Amount in one glass of milk or fortified orange juice.
200 IU	"Adequate intake" per RDA (pre-1997).
400 IU	"Adequate intake" per RDA (post-1997). Reduces risk of rheumatoid arthritis in woman by 50%.
1000 IU	Reduces risk of cancer (breast, colorectal, ovarian, prostate) by 50%.
2000 IU	Reduces risk Type 1 diabetes by 80% reduces upper respiratory tract infections in elderly by 90%
30,000 IU	Minimum to develop toxicity over several months/years.

Recommended levels<sup>†</sup>

Many nutritionist recommend 1,000-2000 IU per day. Therapeutic Use: up to 5,000 IU per day is generally considered safe. At this level it is best to check with your physician or health care practitioner.

Contraindications<sup>†</sup>

People with chronic granulomatus disorder, such as histoplasmosis, sarcoidosis or tuberculosis, should use Vitamin D at levels recommended by their physician. Blood levels above 30ng/ml can cause hypercalcemia and hypercalciuria.

SUGGESTED USE

Take one capsule per day or as directed by your health care provider.

The information in this article is not intended as medical advise, but only as a guide in working with your health care professional.

Supplement Facts

<b>Serving Size: 1 Softgel</b>		<b>Item # 2049</b>	
<b>Servings Per Bottle: 100</b>		<b>Amt. Per</b>	<b>%DV*</b>
Vitamin D-3		Serving	
Naturally sourced cod liver oil	1000IU		250%

Does not contain sugar, salt, wheat, gluten, magnesium stearate or preservatives

Other ingredients: Soybean oil, gelatin, purified water.

\*Percent of daily value are based on a 2,000 calorie diet.

<sup>†</sup>Statements in this bulletin have not been evaluated by the FDA. This information is for educational and informational purposes only and is not intended to diagnose, treat, cure, or prevent any disease.