

I N N A T E

RESPONSE FORMULAS®

V i s m e d i c a t r i x n a t u r a e

Vitamin D-3

100% Whole Food Foundational Dietary Supplement

Formula Rationale

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Formula Rationale of Vitamin D-3

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Vitamin D-3 is a hormone that is naturally created by the skin with adequate sunlight (direct contact with the skin).The primary source of Vitamin D-3 is the sun. Vitamin D-3 is an important link to the sun's life sustaining benefits. Together their energy touches every aspect of the physiology. Vitamin D-3 in conjunction with the sun affects cellular development, cell growth, cellular functions, cell to cell communication, gene expression, immune function, energy metabolism, muscle strength and coordination, neurotransmitter production, some types of inflammatory response and bone development.

The Benefits of Vitamin D-3

Breakthrough research on Vitamin D-3's health benefits has created great excitement in the nutrition community. There is extensive evidence that Vitamin D-3's importance to health goes far beyond the best known benefit. Vitamin D-3's expanding range of therapeutic benefits includes so much more than bone building and enhancing calcium utilization.

Vitamin D-3

- Affects Muscle Strength and Coordination
- Maintains Tissue Function
- Affects Energy Production
- Affects Immune Function
- Affects Gene Expression Vitamin D-3 affects Cell Development, Cell Growth and Cell Function
- Plays a role in Cell to Cell Communication
- Has been shown to be effective in Depression Therapies
- Has been shown to be effective in Autoimmune Disorder (MS) Therapies
- Has been shown to be effective in Therapeutic Cancer Programs
- Has been shown to be effective in Cancer Prevention Programs
- Has been shown to be effective in Lung Health Therapies
- Influences Nervous System Functions, central and peripheral, through its modulation of Neuronal Calcium Metabolism.* (ref. 15)
- Is involved in the creation of neurotransmitters. Vitamin D-3 possesses anti-inflammatory properties and has been shown to be effective in Rheumatoid Arthritis therapies.* (ref. 16)

Vitamin D-3 Deficiency Symptoms

Too little active Vitamin D-3 can lead to or be a contributing factor in: psoriasis, osteoporosis, osteopenia, rickets, thyroid dysfunction, compromised immune function, hearing dysfunction, liver and kidney disorders, some forms of cancer, periodontal disease, cardiovascular disease and decreased insulin sensitivity.

Vitamin D-3 Deficiency Factors

- Avoidance of exposure to the sun
- Use of sunscreens that interfere with D-3 production in the skin (sunscreens over 8 SPF reduce vitamin D production by 95%)(ref.9)
- Living in the North America especially on the Northern Coasts in the winter

- The elderly develop deficiencies with less exposure to the sun on a daily basis
- Aging diminishes Vitamin D synthesis
- Limited vegetarian and raw food sources of vitamin D
- Vitamin D in our food is degraded and catalyzed by light, heat and acids
- Decreased liver and kidney function reduce the ability to convert vitamin D to its active form
- Being overweight
- Mal absorption and digestive problems create difficulty converting vitamin D from food or sun into its active form. •
Low fat diets (healthy fats support vitamin D conversion and utilization)
- Vitamin D deficiency status varies with latitude.
- Dark Skin lessens vitamin D absorption through the skin, therefore African Americans are five times more likely to be deficient than Caucasians. (ref. 2)

Vitamin D-3 Dosage

Current research shows that the physiology's requirements for Vitamin D-3 are higher than previously thought. Recent research indicates those who totally avoid the sun may require as much as 4,000 IU of Vitamin D-3 daily. It is estimated that 20 minutes of direct summer sunlight, unfiltered by clothing, glass or sunscreens, enables the body to manufacture about 20,000 IU of vitamin D. This is much higher than the RDI/RDA set by the government. More research is needed to understand our varying requirements. Exposure to sunlight is an important factor to consider. Supplementation with 400 to 1000 IU is becoming common. Vitamin D-3 nutritional requirements will vary according to sun exposure, age, diet, and health. Most multiple vitamin and mineral supplements have vitamin D at 100-400 IU.

Vitamin D-3 Sources

The importance of Vitamin D-3 to health reinforces the importance of moderate daily exposure to direct sunlight on our quality of life. People in many parts of North America and at different stages of life, have limited exposure to direct, unfiltered sunlight on their skin. Aging contributes to the decline of the manufacture of Vitamin D-3 in the body. Some areas of the country have cloudy days, rain, snow, and cold weather that encourages people to cover their skin or stay indoors. Fear of skin cancer has people using sunscreens and avoiding sunlight exposure. We need 10-20 minutes of direct, unfiltered sunlight on our skin, 3 or more times a week. This does not mean sunburn moderation is prudent. Those with darker skin produce less vitamin D in response to sunlight exposure. While some food is fortified with vitamin D (often in the less bioavailable form D-2) obtaining adequate quantities of Vitamin D from diet alone is difficult, especially a vegetarian diet.

Sunshine and Vitamin D Creation

Vitamin D is produced in the skin following direct exposure to sunlight. When the ultraviolet light from the sun connects with the skins precholesterol molecules (7-dehydrocholesterol) these molecules become provitamin D. This compound is then converted in the liver to 25hydroxyvitamin D (25[OH]D). In the kidneys this intermediate vitamin D is transformed into the 1,25 dihydroxycholecalciferol molecule (D3 calcitrol or 1,25-dihydroxyvitamin D (1,25{OH}2D), the biologically active form. Vitamin D-3 is delivered in the biologically active form.

Vitamin D-3 and Bone Health

- Plays an important role in the treatment of osteoporosis and osteopenia.
- Is an essential part of a bone health and bone loss prevention program.
- Is a vital nutrient for healthy bone growth and development.
- In its active hormone form increases calcium and phosphorus absorption and utilization in the intestines.
- Helps maintain the balance of calcium and phosphorus in the blood and bone.
- Promotes calcium deposits in the matrix of the bone.
- Has revealed activity in the modulation of gene transcription directly affecting the bone. Vitamin D-3 supports bone strength and therefore reduces the risk of fractures. (ref. 29)

Vitamin D-3 and Muscles, Mobility and Coordination

Research has found that strong muscles, good mobility and coordination have been associated with high levels of Vitamin D-3 in the blood. Vitamin D-3 deficiency is connected with muscle weakness. Studies have indicated that the muscle supporting action of vitamin D may contribute to a reduction in falls.

Vitamin D-3 and Pain

Several recent clinical studies have found that Vitamin D-3 deficiency is common in people with musculoskeletal pain. High dose Vitamin D-3 supplementation can reduce pain.

Vitamin D and Cancer Prevention

Studies have shown sufficient Vitamin D-3 levels are linked to a reduced risk of a variety of cancers. Vitamin D-3 is important for healthy cell growth and communication that reduces the risks for some types of cancer. *The American Journal of Public Health* February 2006, reports that researchers searched the Pub Med database and found 63 observational studies of vitamin D status in relation to cancer risk dating from 1966 to 2004. Thirty of those studies focused on vitamin D and colon cancer, 13 on breast cancer, 26 on prostate cancer, and 7 on ovarian cancer. In addition, several studies investigated whether mutations in vitamin D receptors are associated with an increased risk of cancer. After their review, the researchers concluded that the majority of the research found a protective relationship between sufficient vitamin D levels and lower risk of cancer. Most of the studies found that vitamin D could reduce cancer risk by up to 50 percent. Research on vitamin D and its cancer preventing properties is growing in volume and may indicate a need for adequate sunlight or supplementation.

Vitamin D and Autoimmune disorders

Research suggests that Vitamin D-3 plays a role in immune function. Autoimmune disorders such as MS are much less prevalent in countries near the equator, where there is greater exposure to sunlight and greater production of vitamin D.

“Evidence suggests ultraviolet radiation (UVR) may play a protective role in three autoimmune diseases: multiple sclerosis, insulin-dependent diabetes mellitus and rheumatoid arthritis.” (ref.28)

Conclusion

A nutrient that is as important to our physiology as vitamin D must be considered for any supplement program. Vitamin D3 is not prevalent in the diet. Supplementation is an important way to provide enough vitamin D-3 to support Optimal Health.

References:

1. Armas LA, Hollis BW, Heaney RP, “Vitamin D2 is much less effective than vitamin D3 in humans.” *J Clin Endocrinol Metab*; Nov. 2004; 89(11):5387-91
2. Garland CF, Garland FC, et al. “The Role of Vitamin D in Cancer Prevention.” *Amer J of Public Health*. (Feb 6, 2006) 96(2):252-261
3. Deluca HF. “Vitamin D and Health in the 21st Century: Bone and Beyond: Overview of general physiologic features and functions of Vitamin D.” *Am J*

Clin Nutr (Dec. 2004) Vol. 80 (6): 1689S-1696S

4. Nieves JW. "Osteoporosis: the role of micronutrients." *Amer J Clin Nutr* (May 2005) Vol. 81(5); 1232S-1239S
5. Holick MF. "Vitamin D and Health in the 21st Century: Bone and Beyond: Sunlight and Vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease." *Am J Clin Nutr* (Dec. 2004) Vol. 80 (6); 1678S-1688S
6. Weil Andrew Dr. "Shedding New Light on the Sunshine Vitamin." *Self Healing Newsletter* Feb 2006
7. Chapuy MC, Chapuy P. et al. "Calcium and vitamin D supplements: effects on calcium metabolism in elderly people." *Amer J Clin Nutr* Aug 1987 Vol 46 (2): 324-8
8. Adams JS, Kantorovich V et al., "Resolution of vitamin D insufficiency in osteopenic patients results in rapid recovery of bone mineral density." *J Clin Endocrinol Metab* (Aug 1999) 84(8):2729-30
9. Wysong Randy Dr. "ANew and Potent Sun Vitamin Supplement." *Townsend Letter for Doctors & Patients* (Feb/Mar 2006) 73-76
10. Al Faraji, Al Mutairi K. "Vitamin D deficiency and chronic low back pain in Saudi Arabia." *Spine*. (Jan 15 2003)28(2):177-179
11. Hughes AM, Armstrong BK et al. "Sun Exposure may protect against non-Hodgkin lymphoma: a case-control study." *Int J Cancer*. (2004) 112:865-871
12. Plontnikoff GA, Quigley JM. "Prevalence of severe hypovitaminosis D in patients with persistent, non-specific musculoskeletal pain." *Neurology*. (Jan 2004) 13:62(1):60-65
13. Robsahm TE, Tretli S, et al. "vitamin D from Sunlight may improve prognosis of breast-, colon, and prostate cancer (Norway)." *Cancer Causes Control*. (2004) 15:149-158
14. Vasquez A, Manso G, et al. "Clinical importance of vitamin D (cholecalciferol): a paradigm shift with implications for all health care providers." *Integrative Med*. (Oct/Nov 2004) 3(5):44-54
15. Vasquez A. "Integrative orthopedics and vitamin D: testing, administration, and new relevance in the treatment of musculoskeletal pain." *Townsend Letter for Doctors & Patients* (Oct 2004)
16. Merlino LA, Curtis J, et al. "Vitamin D intake is inversely associated with rheumatoid arthritis: results from the Iowa's Women's Health Study." *Arthritis Rheum*. (2004) 50:72-77
17. Grant WB. "An estimate of premature cancer mortality in the United States due to inadequate doses of solar ultraviolet-B radiation." *Cancer* (2002) 94:1867-75
18. Hypponen E, Laara E, et al. "Intake of vitamin D and risk of type 1 Diabetes: a birth-cohort study." *Lancet*. (Nov 3 2001) 358(9292):1500-3.
19. Chiu KC, Chu A, et al. "Hypovitaminosis D is associated with insulin resistance and beta cell dysfunction." *Amer J Clin Nutr*. (2004) 79:820-825 20. Murray, Michael TND. Encyclopedia of Nutritional Supplements. ©1996 Prima Pub
21. Dunne, Lavon J. Nutrition Almanac. ©1990 McGraw-Hill Pub.
22. Garland CF, Garland FC, et al. "Calcium and vitamin D. Their potential roles in colon and breast cancer prevention." *Ann NY Acad Sci*. (1999) 889:107-119
23. Garland C, Shekelle RB, et al. "Dietary vitamin D and calcium and risk of colorectal cancer: a 19 year prospective study in men." *Lancet* (Feb 9 1985) 1(8424):307-9
24. Lefkowitz ES, Garland CF. "Sunlight, vitamin D, and ovarian cancer mortality rates in US women." *Int J Epidemiol* (Dec 1994) 23(6):1133-6
25. Brown AJ, Finch J et al. "Differential effects of 19-nor-1, 25-dihydroxyvitamin D (2) and 1, 25-dihydroxyvitamin D (3) on intestinal calcium and transport." *J Lab Clin Med* (May 2002) 139(5):279-84
26. Black PN, Scragg R. "Relationship between serum 25-hydroxyvitamin D and pulmonary function in the third national health and nutrition examination survey." *Chest*. (Dec. 2005) 128(6):3792-8
27. Gartner L, et al. "Prevention of Rickets and Vitamin D Deficiency: New Guidelines for Vitamin D intake." *Pediatrics*(2003)111(4):908-910
28. The Vitamin D Council. 9100 San Gregorio Road, Atascadero, CA, 93422 <http://www.vitamindcouncil.com>
29. Ushiroyama, Takahisa. "Effect of Continuous Combined Therapy with vitamin K(2) and Vitamin D(3) on Bone mineral Density and Coagulofibrinolysis Function in Postmenopausal Women." *Maturitas* (Mar 25 2002) 41(3):211-21. Tatkatasi, Osaka
30. Bischoff-Ferrari HA, Orav EJ, et al. "Effect of cholecalciferol plus calcium on falling in ambulatory older men and women: a 3-year randomized controlled trial." *Arch Intern Med* (Feb 27, 2006) 166(4):424-30.
31. Liu PT, Stenger S, Huiying L, et al. "Toll-Like Receptor Triggering of a Vitamin D – mediated Human Antimicrobial Response." *Science* Pub. Online Feb. 26, 2006. DOI: 10.1126/science.