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## Product Review: *Vitamin D Supplements (Including Combinations with Calcium and Vitamin K)*

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### What It Is:

Vitamin D is a fat-soluble vitamin. There are two major forms of vitamin D – D3 (cholecalciferol) and D2 (ergocalciferol). Both vitamin D3 and D2 appear to be absorbed with equal efficiency, but vitamin D3 may be more potent and is significantly more efficient in raising serum levels of 25-hydroxyvitamin D – the hormonally active form of vitamin D and a clinical measure of vitamin D status.

Vitamin D2 (ergocalciferol) is made by the conversion of a sterol found in plants and yeast. Vitamin D2 is used in some dietary supplements.

Vitamin D3 is produced naturally in human skin exposed to ultraviolet B light and occurs in some animal products, such as cod liver oil, and, in smaller amounts, in other fatty fish such as herrings, mackerel, sardines, and tuna. Vitamin D3 is the most common form used in dietary supplements and is the form generally used to fortify foods such as milk (which naturally contains a small amount of vitamin D3). Vitamin D3 is made by the conversion of cholesterol compounds.

The forms vary somewhat in how they are best used (see [ConsumerTips™](#) for discussion of different forms).

(See separate reviews of [Calcium](#) and [Vitamin K](#), which are also used in bone health).

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**What It Does:**Bone

Vitamin D regulates the amount of calcium and phosphorus in the body, partly by controlling their levels of absorption. Vitamin D treats and prevents rickets in children and osteomalacia (bone softening) in adults. Given to breast-fed infants, it may help increase bone density. Taken with calcium, it can help decrease post-menopausal bone loss and prevent osteoporosis (loss of bone density). Taking vitamin D and calcium may improve tooth retention in the elderly.

Other effects

Studies suggest that vitamin D may also improve balance and reduce the risk of falls in older adults, for reasons that aren't clear. Much weaker evidence hints that giving vitamin D supplements to infants might decrease the risk of type 1 diabetes later in life, and that if women avoid vitamin D deficiency it might reduce their risk of multiple sclerosis.

Recent research has found that men with low levels of vitamin D in the blood (15 ng/mL and lower) were at increased risk for heart attack compared to those with sufficient levels (30 ng/mL and higher) even after adjusting for other risk factors and physical activity. Lower levels are also associated with a higher risk and severity of depression, a higher risk of dementia, and, in women, a higher risk of developing rheumatoid arthritis. There is conflicting evidence about whether vitamin D helps reduce the overall risk of dying from cancer, although studies have consistently shown that higher vitamin D serum levels were associated with decreased risk of death from gastrointestinal cancers.

A study in post-menopausal women showed 400 IU of vitamin D<sub>3</sub> and 1,000 mg of calcium daily were less likely to gain small to moderate amounts of weight compared to women taking placebo.

For more information about the uses, see the article about [Vitamin D](#) in the Natural Products Encyclopedia on this Web site.

**Quality Concerns and What CL Tested for:**

Like other supplements, neither the FDA nor any other federal or state agency routinely tests calcium or vitamin D supplements for quality prior to sale. However, quality issues can include the following:

- **Labeled Amount** — Does the product really contain the labeled amount of vitamin D?
- **Purity** — Vitamin D supplements often include calcium as an ingredient. Calcium may potentially be contaminated with another mineral – lead. In children, infants, and fetuses, even low levels of lead can adversely affect neurobehavioral development and cognitive function. In adults, lead at somewhat higher levels can cause elevated blood pressure, anemia, and adversely affect the nervous and reproductive systems. Lead is of particular concern during pregnancy as the mother can deliver it to the fetus.
- **Ability to Break Apart for Absorption** — For a tablet to be most useful, it must fully disintegrate prior to leaving the stomach, delivering its contents for absorption in the gut. Some tablets are not properly made and can pass through your body completely or partially intact, depriving you of its ingredients. Remnants of such products are sometimes found in the stool. This happens, for example, when a tablet is too tightly compressed (too "hard") or is too thickly coated.

ConsumerLab.com, as part of its mission to independently evaluate products that affect health, wellness, and nutrition, purchased vitamin D supplements (as well as those with calcium and/or vitamin K) sold in the U.S. and tested them to determine whether they 1) possessed the claimed amount and form of vitamin D, calcium and vitamin K, 2) were able to disintegrate fully to be available for absorption and 3) were free from unacceptable levels of lead (see [Testing Methods and Passing Score](#)).

**What CL Found:**

Three vitamin D-containing supplements did not pass testing because they provided lower amount of other ingredients (calcium and/or



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vitamin K) than claimed on their labels.

- *Garden of Life Living Calcium Advanced* contained only 67.2% of its claimed combination of vitamins K1 and K2 (less than 5% of the total vitamin K found was vitamin K2). In addition, it provided only 89.2% of the claimed amount of calcium.
- *Isotonix Calcium Plus* contained only 87% of its claimed calcium.
- *DaVinci Laboratories of Vermont Vitamin K2 Plus* contained only 63.4% of the claimed amount of vitamin K2.

All products were found to contain their listed amounts of vitamin D except for four in which vitamin D levels could not be accurately measured (as noted in the table below).

Be aware that the suggested dosage of vitamin D varies widely across products. Suggested daily amounts among the products listed below range from 100 IU to 5,000 IU.

None of the products containing calcium exceeded contamination limits for lead. All standard (non-chewable) tablets were able to break apart (disintegrate) properly.

### Test Results by Product:

Listed below are the test results for thirty supplements containing vitamin D. Products are shown in three groups: Those with vitamin D only, those with vitamin D in combination with calcium and/or vitamin K, and those specifically marketed to children. Within each group, products are listed alphabetically. ConsumerLab.com selected seventeen of these products. Thirteen other products (each indicated with an asterisk) were tested at the request of their manufacturers/distributors through the [Voluntary Certification Program](#) and are included for having passed testing. Also listed are four products that are the same as ones that passed but are sold under different brand names.

Shown for each product are the claimed amount and form of the tested ingredient(s) and serving size recommended on its label. Products listed as "Approved" met their label claims and ConsumerLab.com's quality criteria (see [Passing Score](#)). The full list of ingredients (including special dietary designations) is available for each product by clicking on the word "Full Ingredients" in the first column.

Jump to results by ingredient:

- [Vitamin D Only](#)
- [Calcium and Vitamins D and K](#)
- [Calcium and Vitamin D](#)
- [Vitamins D and K](#)
- [Children's](#)

CONSUMERLAB.COM RESULTS FOR VITAMIN D SUPPLEMENTS (INCLUDING COMBINATIONS WITH CALCIUM AND/OR VITAMIN K) Click on <b>\$ Price Check</b> beneath a product name to find a vendor that sells it. To find retailers that sell some of the listed products <a href="#">click here</a> .						
Name of Product, Unit Type, Suggested Serving Size on Label  (Click on "Full Ingredients" for	Manufacturer or Distributor	Daily Suggested Amount of Calcium, Vitamin D, and/or Vitamin K	-- TEST RESULTS -- (See <a href="#">How Products Were Evaluated</a> )			
			Approval Status	Contained Labeled Amount of Calcium, Vitamin D, and/or	Accep- table Lead Level	Broke Apart Properly

				Complete Ingredient List)		
<b>Vitamin D Only:</b>						
<b>GNC Vitamin D-3 1000</b> (tablet, 1 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by General Nutrition Corporation	<b>Vit. D: 1,000 IU D3</b>	<b>APPROVED</b>	✓	NA	✓
<b>Lifetime™ Liquid Vitamin D3</b> (liquid, 1/2 fl oz per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Lifetime™ Nutritional Specialties, Inc.	<b>Vit. D: 1,000 IU D3</b>	<b>APPROVED</b>	✓	NA	NA
<b>Nature's Bounty™ Vitamin D 400 IU</b> (tablet, 1 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Nature's Bounty, Inc.	<b>Vit. D: 400 IU D3</b>	<b>APPROVED</b>	✓	NA	✓
<b>Pure Encapsulations™ Vitamin D3</b> (vegetable capsule, 1-5 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Pure Encapsulations, Inc.	<b>Vit. D: 1,000-5,000 IU D3</b>	<b>APPROVED</b>	✓	NA	NA
<b>Sundown™ Naturals D</b> (softgel, 1-2 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Sundown, Inc.	<b>Vit. D: 400-800 IU D3</b>	<b>APPROVED</b>	✓	NA	NA
<b>Similar to Approved "Vitamin D Only" Products:**</b>						
<b>Puritan's Pride™ Vitamin D-400 IU</b> (tablet, 1 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Puritan's Pride, Inc.	<b>Vit. D: 400 IU D3</b>	Similar to: Nature's Bounty Vitamin D-400 IU			
<b>Vitamin World™ Vitamin D-400 IU</b>	Mfd. by Vitamin World, Inc.	<b>Vit. D: 400 IU D3</b>	Similar to: Nature's Bounty Vitamin D-400 IU			

(tablet, 1 per day) <a href="#">Full Ingredients</a>						
<b>COMBINATION PRODUCTS</b>						
Name of Product, Unit Type, Suggested Serving Size on Label  (Click on "Full Ingredients" for Complete Ingredient List)	Manufacturer or Distributor	Daily Suggested Amount of Calcium, Vitamin D, and/or Vitamin K	-- TEST RESULTS -- (See <a href="#">How Products Were Evaluated</a> )			
			Approval Status	Contained Labeled Amount of Calcium, Vitamin D, and/or Vitamin K	Accep- table Lead Level	Broke Apart Properly
<b>Calcium, Vitamin D, and Vitamin K:</b>						
<b>Adora™ Dark Chocolate Calcium Supplement</b> (chocolate disk, 1-3 per day) <a href="#">Full Ingredients</a>	Mfd. by Thompson Brands.	<b>Calcium:</b> 500-1,500 mg (carbonate)  <b>Vitamin D:</b> 100 - 300 IU D2  <b>Vitamin K:</b> 40 - 120 mcg	<b>APPROVED for Calcium</b>	✓  Vitamins D and K not determined <sup>1</sup>	✓	NA
<b>Garden of Life™ Living Calcium™ Advanced</b> (caplet, 6 per day) <a href="#">Full Ingredients</a>	Dist. by Garden of Life	<b>Calcium:</b> 1,000 mg (MCHA <sup>2</sup> )  <b>Vit. D:</b> 600 IU D3  <b>Vit. K:</b> 125 mcg K1 and K2	<b>NOT APPROVED</b>	Only found 89.2% of claimed calcium  Vitamin D not determined <sup>1</sup>  Only found 67.2% of claimed vitamin K	✓	✓
<b>Nature Made™ Calcium, D and K</b> (tablet, 2 per day)* <a href="#">Full Ingredients</a>	Dist. by Nature Made Nutritional Products	<b>Calcium:</b> 1,500 mg (carbonate)  <b>Vit. D:</b> 1,000 IU D3  <b>Vit. K:</b> 80 mcg K1	<b>APPROVED</b>	✓	✓	✓
<b>Calcium and Vitamin D:</b>						
<b>Caltrate™ 600 + D</b> (tablet, 2 per day)	Mfd. by Wyeth Consumer	<b>Calcium:</b> 1,200 mg	<b>APPROVED</b>	✓	✓	✓

<a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Healthcare	(carbonate) Vit. D: 800 IU D3				
<b>Citracal™ Calcium Citrate Petites with Vitamin D</b> (tablet, 2-4 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Mission™ Pharmaceutical	<b>Calcium: 400-800 mg (citrate)</b> Vit. D: 800 IU D3	APPROVED	✓	✓	✓
<b>Floradix™ Calcium Magnesium</b> (liquid, 2 tbsp per day) <a href="#">Full Ingredients</a>	Mfd. by Salus-Haus	<b>Calcium: 155 mg (gluconate and lactate)</b>  <b>Vitamin D: 200 IU</b>	APPROVED for Calcium	✓ Vitamin D not determined <sup>1</sup>	✓	NA
<b>GNC Calcium Plus® 1000</b> (caplets, 3 per day)* <a href="#">Full Ingredients</a>	Dist. by General Nutrition Corporation	<b>Calcium: 1,000 mg (Calcium Carbonate)</b> Vit. D: 800 IU D3	APPROVED Also approved for <a href="#">Magnesium</a>	✓	✓	✓
<b>Isotonix™ Calcium Plus</b> (powder, 2 capfuls per day) <a href="#">Full Ingredients</a>	Dist. by Market America, Inc.	<b>Calcium: 750 mg (carbonate, lactate, phosphate, sulfate, citrate)</b>  Vit. D: 200-400 IU D3	<b>NOT APPROVED</b>	Only found 87% of claimed calcium  Vitamin D: ✓	✓	NA
<b>Kirkland Signature™ Calcium Citrate</b> (tablet, 2 per day) <a href="#">Full Ingredients</a>	Dist. by Costco Wholesale Corp	<b>Calcium: 500 mg (citrate)</b> Vit. D: 800 IU D3	APPROVED	✓	✓	✓
<b>Life Extension® Bone Strength Formula with KoAct™</b> (capsule, 4 per day)* <a href="#">Full Ingredients</a>	Dist. by Quality Supplements and Vitamins, Inc.	<b>Calcium: 75 mg (calcium collagen chelate)</b> Vit. D: 250 IU D3	APPROVED Also approved for <a href="#">Magnesium</a>	✓	✓	N/A
<b>PhysioLogics™ Vitamin D3</b> (tablet, 1 per day) <a href="#">Full Ingredients</a>	Mfd. by PhysioLogics	<b>Calcium: 115 mg (dicalcium phosphate)</b>	APPROVED	✓	✓	✓

		Vit. D: 2,000 IU D3				
<b>OSCal™ Chewable</b> (chewable tablet, 2 per day) <a href="#">Full Ingredients</a>	Dist. by GlaxoSmithKline Consumer Healthcare, L.P.	Calcium: 1,000 mg (carbonate) Vit. D: 800 IU D3	APPROVED	✓	✓	NA
<b>Puritan's Pride™ Calcium Magnesium with D</b> (tablet, 3 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Puritan's Pride, Inc.	Calcium: 1,000 mg (oyster shell) Vit. D: 400 IU D3	APPROVED	✓	✓	✓
<b>Puritan's Pride™ High Potency Vitamin D</b> (tablet, 1 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Puritan's Pride, Inc.	Calcium: 120 mg (dicalcium phosphate) Vit. D: 1,000 IU D3	APPROVED	✓	✓	✓
<b>Quest High Potency Calcium with Vitamin D</b> (tablet, 2 per day) <a href="#">Full Ingredients</a> ★	Mfd. for Purity Life Health Products	Calcium: 1,200 mg (citrate and carbonate) Vit. D: 400 IU D3	APPROVED	✓	✓	✓
<b>Trader Darwin's™ Calcium Citrate with Vitamin D</b> (tablet, 3 per day) <a href="#">Full Ingredients</a>	Dist. by Trader Joe's	Calcium: 1,000 mg (citrate) Vit. D: 400 IU D3	APPROVED	✓	✓	✓
<b>Twinlab™ Calcium Citrate Chewable Wafers, with Magnesium &amp; Vitamin D</b> (chewable wafer, 4 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Ideasphere Inc.	Calcium: 1,000 mg (citrate tetrahydrate) Vit. D: 400 IU D3	APPROVED <a href="#">Also Approved for Magnesium</a>	✓	✓	NA
<b>Vitamin World™ High Potency Calcium 600 + Vitamin D</b>	Mfd. by Vitamin World, Inc.	Calcium: 600-1,200 mg (carbonate)	APPROVED	✓	✓	✓

(tablet, 1-2 per day)* <a href="#">Full Ingredients</a>		Vit. D: 125-250 IU D3				
<b>Vitamin World™ Super High Potency Vitamin D</b> (tablet, 1-2 per day)* <a href="#">Full Ingredients</a>	Mfd. by Vitamin World, Inc.	<b>Calcium: 115 mg (dicalcium phosphate)</b>  Vit. D: 2,000 IU D3	<b>APPROVED</b>	✓	✓	✓
<b>Similar to Approved "Calcium and Vitamin D" Products: **</b>						
<b>Puritan's Pride™ High Potency Calcium 600 + Vitamin D</b> (softgel, 2 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. By Puritan's Pride, Inc.	<b>Calcium: 1,000 mg (carbonate)</b>  Vit. D: 100 IU D3	Similar to: Vitamin World™ High Potency Calcium + Vitamin D			
<b>Vitamin World™ Calcium Magnesium with D</b> (tablet, 3 per day) <a href="#">Full Ingredients</a>	Mfd. by Vitamin World, Inc.	<b>Calcium: 1,000 mg (oyster shell)</b>  Vit. D: 400 IU D3	Similar to: Puritan's Pride™ Calcium Magnesium with D			
<b>Vitamin D and Vitamin K:</b>						
<b>Allergy Research Group™ Full Spectrum Vitamin K</b> (softgel, 1-2 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. by Allergy Research Group™	<b>Vit. D: 400-800 IU D3</b>  <b>Vit. K: 4,050-8,100 mcg (1,000 mcg Vitamin K1, 3,000 mcg Vitamin K2 Menaquinone-4 and 50 mcg Vitamin K2 Menaquinone-7)</b>	<b>APPROVED</b>	✓	NA	NA
<b>DaVinci™ Laboratories of Vermont Vitamin K2 Plus</b> (capsule, 1-2 per day) <a href="#">Full Ingredients</a>	Dist. by DaVinci™ Laboratories of Vermont	<b>Vit. D: 200-400 IU D3</b>  <b>Vit. K: 50-100 mcg K2 Menaquinone-7</b>	<b>NOT APPROVED</b>	Vitamin D: ✓  Only found 63.4% of claimed vitamin K2 menaquinone-7	NA	NA



<b>Vitamin Shoppe™ Vitamin K2</b> (veggie capsule, 1 per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Mfd. for The Vitamin Shoppe™	Vit. D: 400 IU D3  Vit. K: 100 mcg K2 Menaquinone-7	APPROVED	✓	NA	NA
<b>CHILDRENS SUPPLEMENTS CONTAINING CALCIUM, VITAMIN D, AND/OR VITAMIN K:</b>						
Name of Product, Unit Type, Suggested Serving Size on Label  (Click on "Full Ingredients" for Complete Ingredient List)	Manufacturer or Distributor	Daily Suggested Amount of Calcium, Vitamin D, and/or Vitamin K	-- TEST RESULTS -- (See <a href="#">How Products Were Evaluated</a> )			
			Approval Status	Contained Labeled Amount of Calcium, Vitamin D, and/or Vitamin K	Acceptable Lead Level	Broke Apart Properly
<b>Carlson Baby D Drops™</b> (liquid, 1 drop per day)* <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Carlson, Division of J.R. Carlson Laboratories, Inc.	Vit. D: 400 IU D3	APPROVED	✓	NA	NA
<b>Li'l Critters™ Calcium Gummy Bears with Vitamin D</b> (gummy bears, 2 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Northwest Natural Products™ Inc.	<b>Calcium: 200 mg (tricalcium phosphate)</b>  Vit. D: 200 IU D2	APPROVED	✓	✓	NA
<b>Nutrition Now™ Rhino Calcium, Soft Calcium Chews</b> (chew, 1-2 per day) <a href="#">Full Ingredients</a> <a href="#">\$ Price Check</a>	Dist. by Nutrition Now™ Inc	<b>Calcium: 500-1,000 mg (carbonate)</b>  Vit. D: 100-200 IU Vitamin D2  Vit. K: 40-80 mcg K1	APPROVED for Calcium	Calcium: ✓  Vitamins D and K not determined <sup>1</sup>	✓	NA
*Tested through CL's <a href="#">Voluntary Certification Program</a> prior to, at time of, or after initial posting of this Product Review. **Product identical in formulation and manufacture to a product that has passed testing but sold under a different brand. For more information see CL's <a href="#">Multi-Label Testing Program</a> . <sup>1</sup> Accurate measurement of vitamins D and K can be difficult in some products due to interference by the other ingredients or						

low concentrations. No measurement is provided in the table above in cases where CL determined that such an issue might exist. Lack of a measurement does not indicate that a product does not provide the claimed amount of ingredient.

<sup>2</sup> MCHA - Microcrystalline hydroxyapatite form of calcium

NA -- Not applicable.

Unless otherwise noted, information about the products listed above is based on the samples purchased by ConsumerLab.com (CL) for this Product Review. Manufacturers may change ingredients and label information at any time, so be sure to check labels carefully when evaluating the products you use or buy. If a product's ingredients differ from what is listed above, it may not necessarily be of the same quality as what was tested.

The information contained in this report is based on the compilation and review of information from product labeling and analytical testing. CL applies what it believes to be the most appropriate testing methods and standards. The information in this report does not reflect the opinion or recommendation of CL, its officers or employees. CL cannot assure the accuracy of information provided to it by third parties. Liability to any person for any loss or damage caused by errors, omissions, or inaccuracies in this report is hereby disclaimed.

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## ConsumerTips™:

### What to Consider When Buying:

Before buying a vitamin D supplement, be aware that vitamin D can be obtained in sufficient amounts from fortified milks and foods and from exposure to sunlight. Ten to fifteen minutes of sun exposure at least two times per week to the face, arms, hands, or back without sunscreen is usually sufficient to provide adequate vitamin D. However, inadequate vitamin D intake is common in people who live in northern climates, especially if they are dark-skinned. Also, increased concern about skin cancer has caused people to avoid the sun or use sunscreen, and this creates a potential risk of reduced vitamin D. Americans aged 50 and older are at increased risk of vitamin D insufficiency because, as people age, skin cannot synthesize vitamin D as efficiently and the kidneys are less able to convert vitamin D into its active hormone form. People who are obese also tend to have a low plasma concentration of 25-hydroxyvitamin D, as subcutaneous fat may sequester the vitamin. Consequently, many people may benefit by taking vitamin D as a supplement — either alone or in combination with a calcium supplement. Because vitamin D is a fat-soluble vitamin, people with reduced ability to absorb fat in the gut may also require vitamin D supplementation.

When buying vitamin D, be aware that it is measured in International Units (IU) of vitamin D activity or as micrograms of cholecalciferol (D3) or ergocalciferol (D2). One microgram is equivalent to 40 IU. However, as noted earlier, vitamin D3 appears to be more potent than vitamin D2 and more efficient in raising serum levels of 25-hydroxyvitamin D. This has been shown in two studies using extremely high doses of each form.<sup>1,2</sup>

### What to Consider When Using:

An AI (Adequate Intake) level has been established for vitamin D but is only relevant if an individual is not getting adequate exposure to sunlight. The AI is 200 IU (5 micrograms) for individuals ages 1 to 50, 400 IU (10 micrograms) for those 51 to 70, and 600 IU (15 micrograms) for those 71 years and older. There is substantial evidence, however, that these dosages may be somewhat too low. For example, to prevent osteoporosis and reduce the occurrence of fractures in the elderly, 800 IU daily has been used. Daily intake of 1,000 IU is now recommended for adults in the fall and winter by the Canadian Cancer Society based on studies showing decreased risk of

cancer associated with increased vitamin D intake and/or blood levels. The Canadian recommendation reflects the fact that there is reduced sun exposure in northern latitudes. The recommendation is for 1,000 IU intake year-round for people who are older, have dark skin, don't go outside often, or wear clothing that covers most of their skin. In October 2008, the American Academy of Pediatrics announced its new recommendation that all children, from newborns to teenagers, get 400 IU daily.

Milk fortified with vitamin D contains 400 IU per quart, or 100 IU per cup. Based on the existing Adequate Intake levels (and not recently suggested increased levels), this means that one cup of milk provides one-half of the recommended daily intake for adults between the ages of 19 and 50, one-fourth of the recommended daily intake for adults between the ages of 51 and 70, and approximately 15% of the recommended daily intake for adults age 71 and over.

### Concerns and Cautions:

Excessive intake of vitamin D as a supplement can potentially result in hypercalcemia (too much calcium in the blood) with symptoms including constipation, confusion, weakness, loss of appetite and painful calcium deposit. To avoid these problems, keep total intake of vitamin D from supplements and food under the established upper tolerable intake level which is 2,000 IU (50 micrograms) for individuals 1 year old and above and 1,000 IU (25 mcg) for children younger than one year. Note: It is not thought to be necessary to factor in the amount of vitamin D produced by sun exposure when adding up total vitamin D intake.

It is particularly important to avoid excessive vitamin D during pregnancy, as hypercalcemia in a mother can lead to seizures, mental and/or physical retardation, and other problems in an infant.

For more information see the articles about and [calcium](#) and [vitamin D](#) in the Natural Products Encyclopedia on this Web site. Also see the government report on vitamin D at <http://ods.od.nih.gov/factsheets/vitamind.asp>.

### REFERENCES:

<sup>1</sup> Armas, et al, Vitamin D2 is Much Less Effective than Vitamin D3 in Humans, [The Journal of Clinical Endocrinology & Metabolism, 2004; 89\(1\):5387-5391](#).

<sup>2</sup> Trang, et al, Evidence that vitamin D3 increases serum 25-hydroxyvitamin-D more efficiently than does vitamin D2, American Journal of Clinical Nutrition, 1998; 68:854-8.

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