What is Vitamin D?

Vitamin D is a fat-soluble vitamin which can also occur as D2 (Ergocalciferol) and D3 (Cholecalciferol). Of these, Vitamin D2 is the most common form added to foods and milk. It is not as active as D3. Vitamin D3 is formed in the skin when exposed to ultraviolet sunlight. When formed it is transported, by a transport protein, to the liver and converted into 1, 25-dihydroxvitamin D3: the most biologically active form of vitamin D. The conversion can occur in other organs and tissues including the kidneys, prostate, bone and white blood cells.

Some prominent researchers have identified Vitamin D deficiencies as pandemic. Deficiencies are associated with individuals who have little sunlight exposure, or who have digestive issues with poor absorption or kidney disorders.

Why is Vitamin D important and what does it do in the body?

Vitamin D is a fat-soluble vitamin that plays a role in many important body functions. It is best known for working with calcium to help build and maintain strong bones. Vitamin D is also involved in regulating the immune system, reducing the risk of autoimmune responses such as insulin-dependent diabetes and multiple sclerosis and it may help prevent cancer. A lack of vitamin D3 in mothers during pregnancy has also been associated with the development of autism and developmental disorders.

Carotenoids also play an important part in the prevention of cancer providing as they do antioxidant support.

What amount of Vitamin D do you need each day?

Vitamin D comes in a number of different forms and you have to choose your supplement carefully. The most bio available source is 1, 25-dihydroxyvitamin D3. Requirements are different for each individual but an intake of 700 - 1,000ius/day has been shown to increase serum D3. Intakes for younger adults may be higher, ranging from 4,000 - 10,000ius/day.

The DRI (Daily Recommended Intake) /RDA (Recommended Daily Allowance) of dietary vitamin D are listed on the next page:

Please Note: By definition, the DRI/RDA recommendations apply only to 98% of healthy individuals and are not sufficient for those with higher nutrient requirements based upon their biochemical individuality, genetics, health status, medications, deficiencies, lifestyle, and toxic exposures.

Recommended dietary allowances for vitamin D are listed on the next page.
The National Institutes of Health has set the maximum tolerable upper limit at 1,000 IU daily for infants 0 - 6 months, 1,500 IU daily for infants 6 months to one year, 2,500 IU daily for children 1 - 3 years, 3,000 IU daily for children 4 - 8 years, and 4,000 IU daily for anyone over 9.

### Adult
- 19 - 50 years: 600 IU (recommended dietary allowance)
- 70 years and older: 800 IU (recommended dietary allowance)
- Pregnant and breastfeeding females: 600 IU (recommended dietary allowance)

Ask your doctor before giving a vitamin D supplement to a child.

### Pediatric
- Infants birth to 12 months: 400 IU (adequate intake)
- Children 1 - 18 years: 600 IU (recommended dietary allowance)

Note: The American Academy of Pediatrics (AAP) recommends 400 IU of vitamin D daily for breastfed infants until they are weaned and drinking at least 1 liter per day of whole milk, or formula fortified with vitamin D. The AAP also recommends that children and teens, who drink less than 1 liter of milk a day, take 400 IU of vitamin D.

### Nutrient Deficiency Symptoms and Conditions

What are possible Vitamin D deficiency conditions and symptoms?
- Arthritis
- Burning sensation - mouth and throat
- Cancer
- Depression
- Diarrhea
- Fatigue
- Hair loss
- Increased alkaline phosphate levels (indicating liver stress)
- Insomnia
- Loss of appetite
- Low calcium
- Muscle weakness, twitching or spasms
- Psoriasis
- Restlessness
- Rickets
- Scaly lips
- Seasonal Affective Disorder (SAD)
- Seizures
- Soft Teeth/tooth decay
- Visual problems

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**Recommended Daily Allowance**

5 mcg/Day

**Optimal Daily Allowance**

30 mcg/Day
What are possible Vitamin D excess symptoms?

Dosages of Vitamin D are poorly understood regarding toxicity. You cannot get too much vitamin D from sunlight, and it would be hard to get too much from food. Generally, excess vitamin D is a consequence of taking in too high a dose as a supplement.

Excess vitamin D can cause several side effects including:
- Extreme thirst
- Metal taste in mouth
- Poor appetite
- Weight loss
- Bone pain
- Tiredness
- Sore eyes
- Itchy skin
- Vomiting
- Diarrhea
- Constipation
- A frequency of urination
- Muscle problems

Individuals with the following conditions should be especially careful in taking vitamin D supplements:
- High blood calcium or phosphorus levels
- Heart problems
- Kidney disease
- Sarcoidosis
- Tuberculosis

What steals Vitamin D from the body?

- A lack of sunlight - prevents Vitamin D3 synthesis
- Anti-Hyperlipidemia drugs (bile acid sequestrants): Cholestyramine (Questran) and Colestipol (Colestid)
- Anti seizure medications: Phenytoin (Dilantin), Carbazamine (Tegretol) and Primidone (Mysoline)
- Corticosteroids: Prednisone (Meticorten), Dexamethasone (Decadron), Methylprednisolone (Medrol)
- Gout medications: Colchicine (Colbenemid), Probenecid (Benemid)
- Antifungal medication: Ketoconazole (Nizoral)
- H-2 Receptor Antagonists: Cimetidine (Tagamet), Famotidine (Pepcid), Nizatidine (Axid), Ranitidine (Zantac)
- Weight management drugs: Orlistat (Xenical) as it decreases exocrine output and reduces fat absorption
- Mineral oil - interferes with absorption of vitamin D

Additional drug/vitamin D interactions:
- Atorvastatin (Lipitor) - vitamin D may reduce the amount of Lipitor absorbed, making it less effective
- Calcipotriene (Dovonex) - vitamin D supplements could cause calcium levels to increase in the blood
- Calcium channel blockers - vitamin D may interfere with: Nifedipine (Procardia), Verapamil (Calan), Nicardipine (Cardene), Diltiazem (Cardizem, Dilacor) Amlodipine (Norvasc)
- Corticosteroids - long-term corticosteroids can cause bone loss and osteoporosis and may require additional Vitamin D3 and Calcium
- Digoxin (Lanoxin) - vitamin D may cause levels of calcium to increase in the blood

What tests can be used to assess Vitamin D levels?

- Blood levels Vitamin D as 25-Hydroxyvitamin in serum <75nmol/L is regarded as insufficient.
- Levels >250nmol/L is indicated as toxic.
**What foods contain the highest amounts of Vitamin D?**

**TOP 10 VITAMIN D3 (CHOLECALCIFEROL) RICH FOODS ARE**

1. **Raw herring**
   - 16,218mcg/100g

2. **Pickled herring**
   - 680mcg/100g

3. **Herring (cooked)**
   - 22.5mcg/100g

4. **Oysters**
   - 320mcg/100g

5. **Caviar**
   - 320mcg/100g

6. **Mackerel**
   - 17.5mcg/100g

7. **Salmon**
   - 12.5mcg/100g

8. **Cottage cheese**
   - 2.0mcg/100g

9. **Egg yolk**
   - 1.75mcg/100g

10. **Mushrooms**
    - 27mcg/100g

**What are the best Vitamin D products?**

D3 as 1,25- dihydroxvitamin D3

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All the statements, including product labels, supporting literature and/or product manufacturers websites have not been evaluated by FDA. These products are not intended to diagnose, treat, cure or prevent any disease.
Vitamin D (D2) Ergocalciferol (D3) Cholecalciferol

What are the very best Vitamin D products to buy?

**PRL D3 Serum**
PRL's one-of-a-kind, live-source vitamin D3 delivers premier cardiovascular and immune system support. Vitamin D3 also aids in calcium absorption for healthy bones and teeth. Recent studies propose ideal vitamin D3 should be …

**Klaire VitaSpectrum**
Powdered multiple vitamin/mineral supplement for children with Autism Spectrum Disorders. Natural berry-pomegranate flavor. This comprehensive multiple vitamin/mineral supplement contains 28 highly bioavailable …

**Neurobiologix Stabilizer Cream**
Topical Cream for Neurological, Nervous & Immune System Support / Ultimate Methylation Support. As a solution, our unique topical delivery system assures that our pharmaceutical grade Neuro …

**ProThera MultiThera 3**
Iron- and copper-free multiple formula. Both iron and copper have been eliminated from this version of MultiThera® to address the needs of patients who may have elevated tissue identical in all other respects to MultiThera® 1 …

**Pure Caps Womens Pure Pack**
Women’s Supplement to Support Bone and Heart Health. Now With Metafolin® L-5-MTHF. Sizes Available 30 packets. Each packet contains 6 different supplements, including …

**Pure Caps Mens Pure Pack**
Regardless of your walk of life, all men need to ensure that they get enough of an array of important nutrients. However, who wants to spend their time picking out supplements for a daily …