

Calcium and Vitamin D

Vitamin D is normally taken as a supplement since it is naturally present in only a few foods. It is also produced in the skin with exposure to sunlight. Vitamin D is essential in promoting calcium absorption for normal bone growth and prevention of bone disease. New studies continue to emerge regarding Vitamin D's possible roles in other diseases.

Calcium is needed for our heart, muscles, and nerves to function properly and for blood to clot. Inadequate calcium significantly contributes to the development of osteoporosis. Many published studies show that low calcium intake throughout life is associated with low bone mass and high fracture rates. National nutrition surveys have shown that most people are not getting the calcium they need to grow and maintain healthy bones.

How much is too much? The new IOM (Institutes of Medicine) recommendations for vitamin D and calcium for bone health are thoughtful, cautious, and conservative. For **vitamin D, intake should be no more than 4000 IU daily** and for **calcium, no more than 2000 mg** daily.

Recommended and Tolerable Upper Intake Levels for Calcium and Vitamin D

Age	Recommended Daily Calcium (mg. per day)	Recommended Daily Vit. D (I.U. per day)	Tolerable Upper Limits of Vit. D (I.U. per day)
Less than 1 yr.	200 under 6 months 260 over 6 months	400	1000
Children 1-9 yrs.	1-3 yrs 700 3-9 yrs 100	600	1500
Adolescents 9-18 yrs.	1300	600	2000
Females 19-50 yrs. and Men 51-70 yrs.	1000	600	2000
Females, over 51	1200	600	2000
Females and Men over 71 yrs.	1200	800	2000

Contraindications to treatment with Vitamin D may include a personal history or family history of kidney stones, parathyroid disease and sarcoidosis.

Sources of Vitamin D

Food: Very few foods contain Vitamin D. Fish and fish oils are among the best natural sources and foods fortified with Vitamin D, such as dairy products, provide most of the Vitamin D in our diets.

Sun exposure: Most people meet their Vitamin D needs through exposure to natural sunlight. One hour of sun exposure in July can produce as much as 15,000 IU of Vitamin D. Sunscreens with a sun protection factor of 8 or more appear to block Vitamin D-producing UV rays.

Dietary supplements: In supplements and fortified foods, vitamin D is available in two forms, D₂ (ergocalciferol) and D₃ (cholecalciferol). Vitamin D₃ may be more than three times as effective as Vitamin D₂. Many supplements are being reformulated to contain vitamin D₃ instead of vitamin D₂. **Therefore, look for supplements with vitamin D₃.**

Sources of Calcium and Calcium Supplements

Food : There are many sources for calcium in the diet through calcium rich foods and calcium fortified foods such as dairy products, fish, beans and green vegetables. You can find examples at the NIH website listed below.

Dietary supplements: If you have trouble getting enough calcium in your diet, you may need to take a calcium supplement. The amount of calcium you will need from a supplement depends on how much calcium you obtain from food sources. There are several different calcium compounds from which to choose, such as calcium carbonate and calcium citrate, among others. Except in people with gastrointestinal disease, all major forms of calcium supplements are absorbed equally well when taken with food. However, the actual amount of calcium provided will vary.

The calcium in a compound is called *elemental calcium*. During digestion, the calcium compound dissolves and the elemental calcium becomes available to be absorbed into the blood. If a tablet contains 500 milligrams of calcium carbonate, it contains only 200 milligrams of elemental calcium. This is because only 40% of the calcium compound is elemental calcium. The other 60%, or 300 milligrams, would be from the carbonate ingredient. Most calcium supplements list the *elemental calcium* content on the label. Look for the amount of *elemental calcium* you will be getting.

Absorption of Calcium

Absorption of calcium depends on several other factors. Vitamin D is essential for calcium absorption. Most milks are fortified with this vitamin, but a person on a milk-free diet may need a vitamin D supplement. This is why calcium supplements such as Oscal +D usually contain vitamin D.

Calcium supplements are better absorbed when taken in small doses (500 mg or less) several times throughout the day. In many individuals, calcium supplements are better absorbed when taken with food. It is important to check supplement labels to ensure that the product meets United States Pharmacopeia (USP) standards.

Lactose, the sugar found only in milk, appears to enhance calcium absorption. Only those people who can drink milk or eat other dairy products get the benefit of this effect.

Exercise can increase calcium absorption and retention. A sedentary life-style can contribute to an overall negative calcium balance. A regular exercise program helps maintain healthy bones.

Excess dietary fat and high fiber-containing foods may interfere with calcium absorption.

Excess dietary phosphorous can also decrease calcium retention. A diet high in phosphorous-rich foods like meat, bread, bakery products, potatoes and soda pop should be changed to one that includes less of these foods and more of the calcium-rich foods.

For additional information on Vitamin D visit the NIH Office of Dietary Supplements web site.

<http://dietary-supplements.info.nih.gov/factsheets/vitamind.asp#h1>