Vitamin D Supplement Fact Sheet

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Vitamin D

- fat soluble vitamin that is naturally present in very few foods[1]
- produced endogenously when the skin encounters UV rays from the sun[1, 2]
- available in fortified foods and as a dietary supplement[1, 2]

Role of vitamin D in the body

- Promotes calcium absorption[1]
- Promotes bone growth and remodeling[1]
- Modulation of cell growth[1]
- Neuromuscular and immune function[1]
- Reduction of imflammation[1]
- Modulates cell proliferation, differentiation, and apoptosis[1]

Forms supplemented

- D_2 (ergocalciferol)- manufactured by UV irradiation of ergosterol yeast[2]
- D_3 (cholecalciferol)- manufactured by irradiation of 7-dehydrocholesterol from lanolin and the chemical conversion of cholesterol[2]
- Both forms effectively raise 25(OH)D levels and there is no conclusive evidence of differences in effects[2]

Table 2: Recommended Dietary Allowances (RDAs) for Vitamin D [1]

Age	Male	Female	Pregnancy	Lactation
0–12 months*	400 IU	400 IU		
1–13 years	600 IU	600 IU		
14–18 years	600 IU	600 IU	600 IU	600 IU
19–50 years	600 IU	600 IU	600 IU	600 IU
51–70 years	600 IU	600 IU		
>70 years	800 IU	800 IU		

* Adequate Intake (AI)

Serum 25-Hydroxyvitamin D [25(OH)D] Concentrations

- <12 ng/mL associated with vitamin D deficiency, leading to rickets in infants and children and osteomalacia in adults[1]
- 12-20 ng/mL generally considered inadequate for bone health and overall health in healthy individuals[1, 2]
- >20 ng/mL generally considered adequate[1]

Groups at risk of Vitamin D Inadequacy

- Breastfed infants[1]
- Older adults[1]
- People with limited sun exposure[1]
- People with dark skin[1]
- People with inflammatory bowel disease and other conditions causing fat malabsorption[1]
- People who are obese or who have undergone gastric bypass surgery[1]

Health risks from excessive vitamin D

- Non-specific symptoms such as anorexia, weight loss, polyuria, and heartarrythmias[2]
- Can raise blood calcium levels leading to vascular and tissue calcifications with subsequent damage to the heart, blood vessels, and kidneys[1]
- Toxicity most likely to occur from high intakes of vitamin D and long term intakes above UL increase risk of adverse health effects[1]

Table 4: Tolerable Upper Intake Levels (ULs) for Vitamin D [1]

Age	Male	Female	Pregnancy	Lactation
0–6 months	1,000 IU	1,000 IU		
7–12 months	1,500 IU	1,500 IU		
1–3 years	2,500 IU	2,500 IU		
4–8 years	3,000 IU	3,000 IU		
≥9 years	4,000 IU	4,000 IU	4,000 IU	4,000 IU

Interactions with medications

- Corticosteroids, such as prednisone, can reduce calcium absorption and impair vitamin D metabolism, which can contribute to loss of bone with long-term use[2]
- Weight loss drug orlistat and cholesterol lowering drug cholestyramine reduce absorption of vitamin D[2]
- Epileptic seizure medications phenobarbital and phenytoin increase hepatic metabolism of vitamin D[2]

References

1. Institute of Medicine, Food and Nutrition Board. Dietary Reference Intake for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.
2. National Institutes of Health, Office of Dietary Supplements Dietary Supplement Fact Sheet: Vitamin D. http://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/ June 24, 2011.