

A Functional Approach: Vitamins and Minerals: Nutrition: Concepts and Controversies

**A Functional Approach: Vitamins and Minerals
Nutrition: Concepts and Controversies, 13/e
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BONE HEALTH
Bones in the body break down (resorb) in order to be replaced through the bone remodeling process. The bone structure within varying areas inside the body is constantly being broken down and replaced. The process of bone remodeling is essential to the growth and maintenance of healthy bones. Vitamin D plays a role in bone health, and calcium is a key nutrient for bone growth and maintenance. These nutrients are essential for the body to build and maintain healthy bones. The following table provides a functional approach to understanding the role of these nutrients in bone health.

Vitamin*	Function	Food Source	Deficiency Effect	Toxicity Effect	Chapter/Page Reference
Vitamin D (fat-soluble) RDA: 15 µg (600 IU) UL: 100 µg (4,000 IU)	Regulation of bone metabolism and calcium absorption by increasing production of calcitriol. Calcitriol, in turn, stimulates bone formation and inhibits bone resorption.	Fatty fish, egg yolks, fortified dairy products, fortified cereals, mushrooms, and fortified plant-based milks.	Children: Rickets (soft bones and skeletal deformities). Adults: Osteoporosis (weakened bones and increased fracture risk).	Hypervitaminosis D (excess): Hypercalcemia (high calcium levels), leading to weakness, nausea, and kidney stones.	Chapter 1, pp. 205-206; Chapter 8, pp. 209-210
Vitamin K (fat-soluble) RDA: 120 µg UL: 1,000 µg	Facilitates protein synthesis for bone mineralization and blood clotting.	Green leafy vegetables (kale, spinach, broccoli), soybean oil, and fermented soy products (natto).	Severe deficiency: Osteoporosis (weakened bones).	Excessive intake: Bleeding disorders (due to impaired blood clotting).	Chapter 1, pp. 205-206; Chapter 8, p. 210
Vitamin A (fat-soluble) RDA: 900 µg (3,000 IU) UL: 10,000 µg (30,000 IU)	Essential for bone growth and maintenance. It is involved in the regulation of gene expression and bone cell activity.	Animal products: Liver, fish oils, and dairy products. Plant-based sources: Carrots, sweet potatoes, and leafy greens.	Deficiency: Osteoporosis (weakened bones).	Excessive intake: Liver damage, bone pain, and other complications.	Chapter 1, pp. 205-206; Chapter 8, pp. 209-210
Vitamin C (water-soluble) RDA: 90 mg UL: 2,000 mg	Essential for collagen synthesis, which is a key component of bone structure.	Citrus fruits, berries, kiwi, and other fruits and vegetables.	Deficiency: Osteoporosis (weakened bones).	Excessive intake: Kidney stones and other complications.	Chapter 1, pp. 205-206; Chapter 8, pp. 209-210

*The Chapter 10 Vitamins and Chapter 8 Water and the Minerals in additional information.
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Reviews

It is in a of the best publication. It really is rally intriguing throgh reading through period of time. You will not feel monotony at anytime of your own time (that's what catalogs are for relating to in the event you request me).
(Dr. Pat Hegmann)

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