

# OsteoBase



## RECOMMENDED USE

- *Helps to build strong bones*
- *Helps in the absorption and use of calcium*

## MUSCULOSKELETAL HEALTH

OsteoBase includes 300 mg of elemental calcium and 300 mg of elemental magnesium per serving, with multiple forms of calcium to ensure maximum absorption. OsteoBase also includes the highest-quality forms of vitamin K2 (MK-7), and vitamin D (D3) to ensure maximum bioavailability and a synergistic benefit for the absorption and assimilation of calcium within the body (vitamin D). OsteoBase covers a common deficiency, vitamin D, and other musculoskeletal nutrients needed in a convenient, foundational bone health formula.

### Overview

Epidemiologic studies and national nutrient surveys indicate key nutrient deficiencies are widespread, specifically vitamin D, which plays a dynamic role in calcium absorption, integration and administration within the body.<sup>1,2</sup> Dietary intake data collected in the 2004 Canadian Community Health Survey (CCHS) found that, at a national level, there seems to be a high prevalence of inadequate vitamin D intakes from food sources (range 75-96%; with most age and gender groups having about 90% prevalence of inadequate intakes).<sup>3</sup> Data on vitamin D intakes from food and supplement source combined show a lower prevalence of inadequate vitamin D intakes, although still above 50% (range 54-84%, depending on age and gender).<sup>4</sup> Poor diets, nutrient depletion from medications, and poor intestinal absorption all contribute to reduced intake of vitamin D, as well as magnesium and vitamin K. OsteoBase provides 300 mg of calcium and 300 mg of magnesium per serving, in a 1:1 ratio.

### Calcium

Calcium in bone is combined with phosphorus to form microcrystalline hydroxyapatite (MCH). In the body,

phosphorus is second in abundance only to calcium, and is necessary for bone health. Phosphate makes up 50% of bone tissue and is an essential ingredient in calcium supplements to develop and maintain bone health. OsteoBase uses multiple forms of calcium to maximize absorption.<sup>5</sup>

### Magnesium

Magnesium comprises about 1% of bone mineral and is known to influence both bone matrix and bone mineral metabolism. A tight control of magnesium homeostasis seems to be crucial for bone health.<sup>6,7</sup>

Calcium and magnesium balance is maintained through an intricately linked relationship that support foundational bone health.<sup>8,9</sup>

### Vitamin K2 (as MK-7)

Vitamin K2 helps to bind newly absorbed calcium to the mineral matrix in bone through its activation of the protein osteocalcin. In addition, vitamin K has been found to help maintain bone mineral density by decreasing the activity of osteoclasts, or cells that break down the bone matrix.<sup>10,11</sup> A 2005 study from northern Finland found that those with greater levels of vitamin K-carboxylated osteocalcin had stronger bones than those with lower levels of the protein.<sup>12</sup> A Japanese study found superior bone health among women who frequently consumed vitamin K2 (as MK-7) compared to those who did not.<sup>13</sup>

### Vitamin D (as D3)

Vitamin D is essential for the efficient utilization of calcium by the body. Vitamin D helps in the absorption and use of calcium by increasing the intestinal absorption of dietary calcium,

increasing the reabsorption of calcium filtered by the kidneys, and mobilizing calcium from bone when there is insufficient dietary calcium.<sup>14,15</sup> Vitamin K and vitamin D share similar qualities, and act in synergy within the body to maintain bone health. A randomized study that split 172 women into a vitamin K2 group, a vitamin D3 group, a vitamin K2 and D3 group, and a placebo group for two years found that the combination of vitamin D3 and K2 had the most benefits for supporting bone health among the groups.<sup>16</sup> This formulation includes 45 mcg of vitamin K2 and 1,000 IU of vitamin D3 per capsule for optimal absorption and use by the body.

## Recommended Dose

**Adults:** Take 3 capsules per day. Take with food a few hours before or after taking other medications or natural health products.

## Medicinal Ingredients (per capsule)

Magnesium (Dimagnesium malate).....	100 mg
Calcium (DimaCal® Dicalcium malate, Calcium phosphate, tribasic).....	100 mg
Phosphorus (Calcium phosphate, tribasic).....	21.67 mg
Vitamin D3 (Vitamin D, Cholecalciferol).....	8.33 mg
Vitamin K2 (Menaquinone 7) (MenaQ7®PRO) .....	15 mcg

## Non-Medicinal Ingredients

Stearic acid, Magnesium stearate, Hypromellose.

## Risk Information

If you are taking blood thinners, consult a health care practitioner prior to use.

## References

1. Rosanoff A, Weaver CM, Rude RK. Suboptimal magnesium in the United States: are the health consequences underestimated? *Nutr Rev.* 2012 Mar;70(3):153-64.
2. Nielsen FH. Magnesium, inflammation, and obesity in chronic disease. *Nutr Rev.* 2010 Jun;68(6):333-40.
3. Health Canada. (2017, August 24). Canadian Community Health Survey. <https://www.canada.ca/en/health-canada/services/food-nutrition/food-nutrition-surveillance/health-nutrition-surveys/canadian-community-health-survey-cchs.html>.
4. Health Canada. (2012, March 22). Vitamin D: Usual intakes from food and supplement sources. <https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/vitamins-minerals/vitamin-usual-intakes-food-supplement-sources.html>.
5. Clarkson PM, Haymes EM. Exercise and mineral status of athletes: calcium, magnesium, phosphorus, and iron. *Med Sci Sports Exerc.* 1995 Jun;27(6):831-43.
6. Castiglioni S, Cazzaniga A, Albisetti W, Maier JA. Magnesium and osteoporosis: current state of knowledge and future research directions. *Nutrients.* 2013;5(8):3022-3033.
7. Sojka JE, Weaver CM. Magnesium supplementation and osteoporosis. *Nutr Rev.* 1995;53(3):71-74.
8. Russell IJ, Michalek JE, Flechas JD, Abraham GE. Treatment of fibromyalgia syndrome with Super Malic: a randomized, double blind, placebo controlled, crossover pilot study. *J Rheumatol.* May 1995;22(5):953-958. (Magnesium Malate/Malic Acid Research).
9. Abraham G, Flechas JD. Management of fibromyalgia: rationale for the use of magnesium and malic acid. *J Nutr Med.* 1992;3:49-59. (Magnesium Malate/Malic Acid Research).
10. Shea MK, Booth SL, Massaro JM, Jacques PF, D'Agostino RB Sr, Dawson-Hughes B, Ordovas JM, O'Donnell CJ, Kathiresan S, Keaney JF Jr, Vasan RS, Benjamin EJ. Vitamin K and vitamin D status: associations with inflammatory markers in the Framingham Offspring Study. *Am J Epidemiol* 2008; 167(3):313-20.

11. Gundberg CM, Lian JB, Booth SL. Vitamin K-dependent carboxylation of osteocalcin: friend or foe? *Adv Nutr.* 2012;3(2):149-157.
12. Knapen MH, Drummen NE, Smit E, Vermeer C, Theuwsen E. Three-year low-dose menaquinone-7 supplementation helps decrease bone loss in healthy postmenopausal women. *Osteoporos Int.* 2013;24(9):2499-2507.
13. Kaneki M, Hodges SJ, Hosoi T, et al. Japanese fermented soybean food as the major determinant of the large geographic difference in circulating levels of vitamin K2: possible implications for hip-fracture risk. *Nutrition.* 2001; 17(4):315-21.
14. Bikle DD. Vitamin D metabolism, mechanism of action, and clinical applications. *Chem Biol.* 2014;21(3):319-329.
15. Feskanich D, Willett WC, Colditz GA. Calcium, vitamin D, milk consumption, and hip fractures: a prospective study among postmenopausal women. *Am J Clin Nutr.* 2003;77(2):504-511.
16. Ushiroyama T, Ikeda A, Ueki M. Effect of continuous combined therapy with vitamin K(2) and vitamin D(3) on bone mineral density and coagulofibrinolysis function in postmenopausal women. *Maturitas.* 2002; 41(3):211-21.