OsteoStrength MK7

HormoneSynergy®
Nutraceuticals

Clinical Applications

- Provide a Calcium-Free Option and MCHC Options for Bone Support*
- Provide a Multifaceted Approach to Bone Maintenance and Strength*
- Provide Foundational Bone Support with Choline-Stabilized Orthosilicic Acid (ch-OSA®)*
- Support Bone Collagen Formation, Bone Mineral Density, and Bone Calcium Binding Sites*
- Provide a Complementary Combination of Micronutrients*

OsteoStrength MK7 *formula offers a variety of micronutrient profiles that allow scope for individualized nutritional support of bone health and maintenance. The foundation of this distinct formula is choline-stabilized orthosilicic acid (ch-OSA®), a source of the mineral silicon. Silicon has been researched for its role in collagen synthesis and bone mineral density (BMD). By adding other bone-specific nutrients to the ch-OSA foundation, OsteoStrength MK7 is tailored to meet individual needs.**

All Hormone Synergy® Nutraceuticals Formulas Meet or Exceed cGMP Quality Standards

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OsteoStrength MK7

Discussion

Bone health is dependent on a constant supply of micronutrients for maintenance and repair. Instead of adopting a single-nutrient, unbalanced approach to supplementation, Hormone Synergy® Nutraceuticals utilizes an array of complementary, well-researched nutrients in its OsteoStrength MK7 to build and maintain bone over time.*

ch-OSA® (Choline-Stabilized Orthosilicic Acid)
ch-OSA is a patented, stabilized, readily absorbed, and bioactive form of silicon called orthosilicic acid. Because regular orthosilicic acid is highly unstable, leading it to form polymers, and because the polymers are too large for the human body to absorb, ch-OSA features patented "choline stabilization" technology. This stabilization prevents polymers from forming, ensuring optimal absorption of orthosilicic acid.*

Decades of research suggest that there is a positive association between dietary silicon and bone mineral density (BMD).[1] The mechanisms of action appear to be silicon's support of collagen synthesis and stabilization, extracellular matrix mineralization, and connective tissue integrity.[2,3] Cell-line studies have shown that type I collagen synthesis is stimulated by orthosilicic acid (silicon).[4] Type I collagen is a dense, heavily cross-linked protein that creates an extremely high tensile strength[5] and contributes to bone strength and flexibility. These strong collagen strands are believed to create core-post "binding sites" for calcium and other bone minerals.*[6-8]
In a 12-month clinical trial conducted at St. Thomas' Hospital in London, women already taking 1000 mg of calcium and 800 IU of vitamin D, to which they added ch-OSA, saw thighbone mineral density at the hip (i.e., femoral neck) increase by 2.00% compared to placebo. This was as a result of an increase in actual bone formation, not just a decrease in loss.[9] Furthermore, the procollagen marker P1NP (procollagen type-1 N-terminal propeptide) increased significantly after 12 months in women who took ch-OSA compared to women in the placebo group. P1NP is known as the most sensitive marker for bone collagen formation and an early marker of bone formation.[9] Animal studies support the human clinical findings for ch-OSA with respect to collagen formation and BMD.*[6,7,10]

Microcrystalline Hydroxyapatite Concentrate (MCHC)
XYMOGEN uses standardized, safe, bovine-sourced MCHC (Ossopan) from New Zealand. The OIE-World Organisation for Animal Health has classified New Zealand as a "negligible BSE risk country," the most favorable official classification a country can be given.[11] MCHC is manufactured under proprietary processes that meet FDA, USDA, and EU regulatory requirements, and frequent heavy metal assays assure purity. Proprietary techniques preserve the bioactive contents of bone and create a naturally balanced formula because whole-bone extract provides an array of nutrients found in healthy bone: calcium, phosphorus, magnesium, bioactive growth factors, type I collagen, amino acids, glycosaminoglycans, and a broad range of essential trace elements. Gentle processing retains the delicate protein matrix and organic factors, and X-ray-diffraction analysis confirms the microcrystalline structure. The MCHC is assayed for hydroxyproline content and the collagen content is greater than 22% with the majority being type I, the predominant collagen occurring in bone.*

Decades of scientific studies suggest that Ossopan/MCHC supplementation fundamentally supports BMD and bone health.[12-15] A meta-analysis of six controlled studies suggested that hydroxyapatite was significantly more effective than calcium carbonate in supporting bone structure and BMD, and another study favorably compared its absorption to calcium gluconate.*[16,17]

Vitamin D3
Although vitamin D3 (cholecalciferol) is made in the skin when 7-dehydrocholesterol reacts with sunlight, many things affect the degree to which this biosynthesis occurs, including time of day, seasons, location, smog/pollution, clothing, shade of skin (darker skin requires more sun), and sunscreen use. Low-cholesterol diets and certain cholesterol therapies can also affect vitamin D formation. By some estimates, one billion people worldwide have vitamin D deficiency or insufficiency.[18] The body needs vitamin D to absorb calcium, and the importance of vitamin D in skeletal health and bone density is well-established. Without adequate absorption, the body must take calcium from its stores in the skeleton, which weakens existing bone and prevents the formation of strong, new bone. Researchers suggest that vitamin D supplementation may decrease bone turnover and increase BMD.[19] A pooled analysis evaluating 11 randomized, double-blind, placebo-controlled trials supported this analysis. It concluded that vitamin D supplementation (> 800 IU daily) was favorable in maintaining hip and nonvertebral bone integrity in individuals aged 65 and older.*[20]

Although D2 and D3 are similar biochemically, one study demonstrated D3 to be approximately 87% more potent in raising and maintaining serum calcidiol (the body's storage form) concentrations and in producing two- to threefold greater storage of vitamin D than did equimolar D2.*[21]

OsteoStrength MK7 provides ch-OSA, MCHC, and D3, as well as vitamin K2 as menaquinone-7 (MK-7).

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***These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Vitamin K2
MK-7 is a bioactive, bioavailable form of vitamin K2.[22] The biological role of vitamin K in relation to calcium and bone is to help deposit calcium into appropriate areas in the body, such as bones and teeth. Conversely, vitamin K is needed to prevent the accumulation of calcium in other areas, such as in arteries and soft tissues, through vitamin K-dependent carboxylation of Gla proteins. Vitamin K also supports bone integrity by moderating the synthesis of prostaglandin E2 (PGE-2) and interleukin-6 (IL-6) by osteoclasts.[23,24] A three-year study utilizing 180 mcg/d of MK-7 concluded that MK-7 significantly improved vitamin K status, supported bone mineral content and BMD, and favorably supported bone strength and integrity in healthy postmenopausal women.*[25]

Bonolive Olive Leaf Extract
Bonolive is a pharmaceutical-grade olive leaf extract that features a unique polyphenol complex (40% polyphenols), including oleuropein. This proprietary olive leaf extract preparation is fully water-soluble, which makes its oral bioavailability superior. Historical and traditional use as well as clinical testing and toxicological assessment confirm the safety of its oral consumption.*[26,27]

Stem cell research has shown that olive polyphenol bioactivity is associated with increased osteoblast formation, increased extracellular matrix mineralization, and overall bone maintenance.[28] Five preclinical studies in a well-established rat model for bone health demonstrated that olive polyphenols exert protective effects on the formation and maintenance of bone.[29-33] In addition, a randomized, double-blind, placebo-controlled clinical study provided strong support for Bonolive supplementation. The results of this study revealed that 250 mg/d of Bonolive promoted a statistically significant improvement (32% increase) in levels of the bone formation marker osteocalcin over a 12-month period. Furthermore, DEXA scan results suggested that Bonolive supplementation positively supported BMD at the lumbar spine and the femur neck compared to placebo.[26] The treatment group also experienced reduced adipocyte formation and a positive effect on lipid metabolism (i.e., cholesterol and triglycerides), confirming Bonolive's double mode of action: to positively influence bone health and cardiovascular health. Other research continues to confirm the positive cardiovascular effects of olive leaf extract and oleuropein at varying doses.*[34-37]

Certain cytokines (IL-1, TNF-alpha, IL-6) are thought to be involved in bone turnover regulation by increasing bone resorption.[30] Moreover, an excess of reactive oxygen species can impair bone metabolism and lead to bone loss.[38] In experimental animal studies on ovariectomized rats, oleuropein and olives were shown to improve cytokine and oxidative status and thereby support bone maintenance.[29-32] Garcia-Villalba et al demonstrated the superior oral bioavailability of Bonolive polyphenols and their positive effect on antioxidant status in pre- and postmenopausal women.[39] Furthermore, the oxidative stress marker malondialdehyde (MDA), formed in the process of lipid oxidation, decreased by 32% after supplementation.*

As an interesting note, a synergistic effect of olive oil and vitamin D has been proposed. Tagliaferri et al demonstrated that virgin (high polyphenol content) olive oil fortified with vitamin D3 helped maintain bone density in mice challenged by estrogen deprivation.*[38]

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Supplement Facts

Serving Size: 1 Packet
Servings Per Container: 60

	(2) Bone Support with vitamins D3 and K2 Capsules		(1) ch-OSA® Capsule	
	Amount Per Serving	%DV	Amount Per Serving	%DV
Vitamin D3 (cholecalciferol)	1000 IU	250%		
Vitamin K2 (as menaquinone-7)(VitaMK7™)	45 mcg	56%		
Calcium (as MCHC†)	550 mg	55%		
Phosphorus (as MCHC†)	198 mg	20%		
MCHC†	2.2 g	**		
Microcrystalline Hydroxyapatite (as MCHC†)	1.32 g	**		
Choline (as choline-stabilized orthosilicic acid‡)			60 mg	**
Silicon (as choline-stabilized orthosilicic acid‡)			3 mg	**

** Daily Value (DV) not established.

Other Ingredients for Bone Support with vitamins D3 and K2 capsule: HPMC (capsule), vegetable stearic acid, vegetable magnesium stearate, medium-chain triglycerides, and silica.
Other Ingredients for ch-OSA capsule: Microcrystalline cellulose, HPMC (capsule), and purified water.

‡Choline-stabilized orthosilicic acid (ch-OSA) is a registered trademark of and manufactured by Bio Minerals n.v., Belgium. Produced under US patents 5,922,360; 7,968,528; and 8,771,757.
VitaMK7 is a trademark of Gnosis S.p.A.
†Microcrystalline Hydroxyapatite Concentrate

Directions

Consume the contents of one packet with a meal, one to two times daily, or as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking medication should discuss potential interactions with their healthcare practitioner. Consider total vitamin K intake (food + supplements) if you are taking blood-thinning medication. Present studies show that 45 mcg of MK-7 from VitaMK7™ daily is not likely to interfere with blood-thinning medicines. Do not use if tamper seal is damaged.

Does Not Contain

Wheat, gluten, yeast, soy protein, dairy products, fish, shellfish, peanuts, tree nuts, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or artificial preservatives.

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