



Whole Earth & Sea™

# Pure Food Vegan Bioenhanced Vitamin D3 1000 IU

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RESEARCH INFORMATION

## Feature summary

Whole Earth & Sea Pure Food Vegan Bioenhanced Vitamin D3 is a new plant-based source of this essential nutrient, developed especially for vegans and vegetarians. Carefully extracted from lichen, it provides natural vitamin D in its most bioactive form, cholecalciferol (vitamin D3).

Vitamin D, known as “the sunshine vitamin”, is vital for bone development and immune system health. It facilitates efficient calcium utilization, which in turn helps form and maintain strong bones and teeth. Vitamin D also contributes to a healthy immune system. Since the chief dietary source of vitamin D is fish and fortified dairy products, strict vegetarians and vegans are often lacking in vitamin D. With 1000 IU in each capsule, Vegan Bioenhanced Vitamin D3 helps meet individual vitamin D requirements when dietary intake or sun exposure is low.

In keeping with the whole food focus of the Whole Earth & Sea line, plant-based vegan vitamin D3 is highly bioavailable. It is sourced from a unique species of non-GMO lichen which has the ability to produce vitamin D in the natural D3 form. Vitamin D3 is more easily absorbed and utilized by the body. The lichen is wild-harvested and extracted in a sustainable manner, and carefully processed to ensure optimum purity and stability.

## How it works

While vitamin D is available from certain dietary sources, this essential fat-soluble vitamin is usually synthesized by the body through a complex chain of reactions beginning in the skin. The sun’s UV rays convert cholesterol in the skin into cholecalciferol, a form of vitamin D3. The liver then converts this into calcidiol (25-hydroxyvitamin D3), an inactive form of vitamin D3 circulated and stored in the body. Next the kidneys convert calcidiol into calcitriol (1,25-dihydroxy-vitamin D3), the highly active form of vitamin D3.

Bones are often thought of as a static framework for the body, but they are actually dynamic, living tissues that constantly regenerate. While calcium is the main nutrient needed for bone development, vitamin D is vital to bone health. Vitamin D3 enables normal bone mineralization by enhancing the absorption of calcium in the digestive tract.

Vitamin D is important for far more than just healthy bones. There are vitamin D receptors on nearly all cells, including the white blood cells that make up the immune system. Vitamin D stimulates these receptors to enhance the immune system’s capacity to defend against harmful microbes. It also promotes the expression of the antimicrobial proteins that are responsible for fighting off pathogens.

## Research

Research shows that during the winter months, when exposure to ultraviolet light from the sun is at its lowest, 40% of Canadians are deficient in vitamin D. At any given time, 25–50% of Canadians don't get enough of this essential nutrient (Janz et al., 2013). Vegetarians and vegans are particularly likely to be deficient, since they consume less of the foods that are typically fortified with vitamin D.

Vitamin D is necessary for the absorption of calcium in order to increase bone mineralization. Calcium and vitamin D work together to maintain peak bone mass and prevent the bone loss that occurs with age. A 10-year population-based study evaluated 9,382 men and women over the age of 25. The study revealed a significant association between calcium and vitamin D supplementation, and improved bone mineral density. Participants taking vitamin D in doses greater than 400 IU per day had significantly higher bone mineral density in the hip region (Zhou et al., 2013). Because hip fractures are a common sign of weakened bones, this study shows the promise of calcium and vitamin D supplementation in preventing bone loss. Another random, double-blind, placebo-controlled clinical trial demonstrated the effectiveness of supplemental calcium (1000 mg) and vitamin D (400 IU) in preventing hip and other fractures. More than 36,000 postmenopausal women were followed for an average of seven years. The subjects who received supplemental calcium and vitamin D had a hazard ratio of 0.062 for hip fracture, meaning they were significantly less likely to have a hip fracture than the placebo group (Prentice et al., 2013).

Vitamin D is essential to the proper functioning of the body's immune system. It plays a key role in enhancing immunity and promoting natural defences against microorganisms. Receptors for vitamin D are present on most of the body's cells, including macrophages. When faced with an attack by pathogens, the number of vitamin D receptors on those cells increases, underlining the importance of the connection between vitamin D and innate immunity (Chun et al., 2014). In the case of the adaptive immune system, vitamin D has been shown to suppress inflammation and promote immune tolerance (Chun et al., 2014).

Vitamin D is especially important for endurance athletes, due to their increased susceptibility to upper respiratory tract infections (URTIs) as a result of the immune suppression that occurs after intense, extended physical activity. In one clinical trial, endurance athletes whose blood tests showed inadequate levels of vitamin D had a 40% greater incidence of URTIs than those who had optimal vitamin D levels. Athletes deficient in vitamin D also experienced more severe infections, lasting on average eight days longer than those of athletes with optimal vitamin D levels (He et al., 2013).

The phenomenon of depressed mood in winter months has been noted for over 2,000 years, and has been associated with vitamin D deficiency. A meta-review showed that vitamin D supplementation has a positive impact on cognitive function and mood, and may be comparable with the effect of traditional antidepressant medication (Spedding 2014).

## Ingredients

### Each capsule contains:

Vitamin D3 (cholecalciferol) (lichen)..... 1000 IU (25 mcg)

## Dosage

**Recommended adult dose:** 1 capsule daily or as directed by a health care practitioner.

## Cautions

Keep out of the reach of children.

## References

- Chun, R.F., Liu, P.T., Modlin, R.L., et al. (2014). Impact of vitamin D on immune function: lessons learned from genome-wide analysis. *Front Physiol*, 5, 151.
- He, C.S., Handzlik, M., Fraser, W.D., et al. (2013). Influence of vitamin D status on respiratory infection incidence and immune function during 4 months of winter training in endurance sport athletes. *Exercise Immunology Review*, 19, 86-101.
- Janz, T., & Pearson, C. (2013). Vitamin D blood levels of Canadians. Statistics Canada Catalogue no. 82-624-X. Available at: <http://www.statcan.gc.ca/pub/82-624-x/2013001/article/11727-eng.htm>
- Prentice, R., Pettinger, M., Jackson, R., et al. (2013). Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. *Osteoporosis International*, 24, 567-580.
- Spedding, S. (2014). Vitamin D and Depression: A Systematic Review and Meta-Analysis Comparing Studies with and without Biological Flaws. *Nutrients*, 6(4), 1501-1518.
- Zhou, W., Langsetmo, L., Berger, C., et al. (2013). Longitudinal changes in calcium and vitamin D intakes and relationship to bone mineral density in a prospective population-based study: the Canadian Multicentre Osteoporosis Study. *Journal of Musculoskeletal Neuronal Interactions*, 13(4), 470-479.