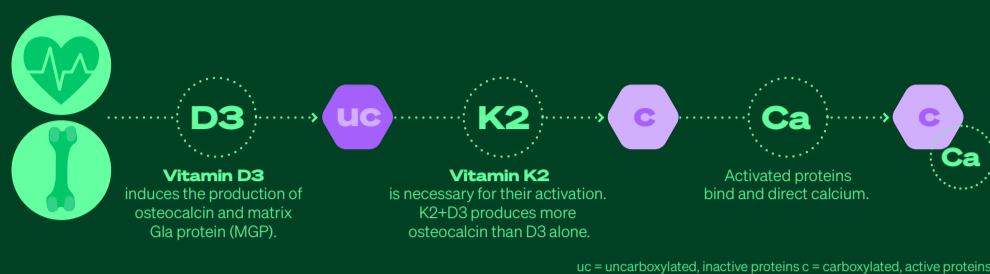


Vitamin K2 and D3 – The Perfect Pair

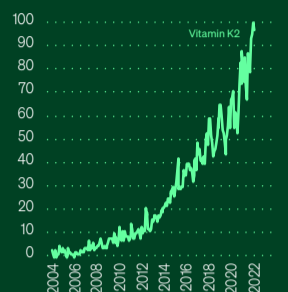
Calcium is the most abundant mineral in the body. Vitamin D3 increases calcium absorption into the bloodstream. Vitamin K2 activates osteocalcin and MGP to put calcium in balance.



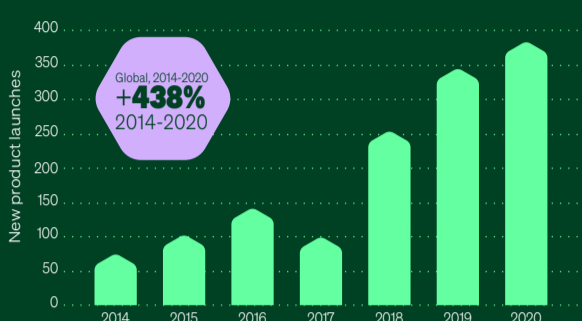
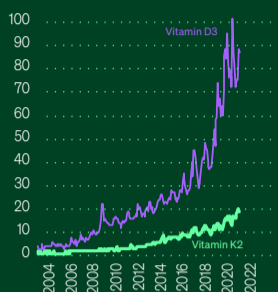
Consumers understand the benefits of D3 and K2 synergy

Long term Google trends – search behaviour

Vitamin K2 – worldwide



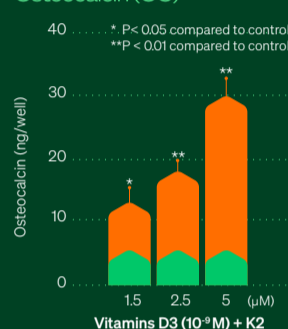
D3 vitamin vs. K2 vitamin – worldwide



Benefiting from both the personal wellness surge and a broader appreciation of the widespread benefits of vitamin K2 in healthy aging, this category continues its rise in popularity and growth.

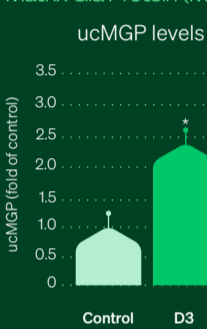
D3 + K2 synergy is scientifically proven

Osteocalcin (OC) ⁽¹⁾



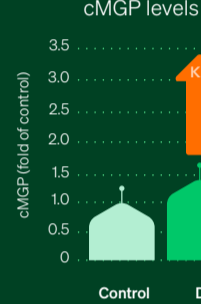
+ Vitamin K2 enhances D3-mediated osteocalcin accumulation in the extracellular matrix.

Matrix Gla Protein (MGP) ⁽²⁾



+ The effect of D3 on MGP confirms demand for K2 to activate MGP. With sufficient amounts of K2, MGP can be carboxylated and effectively bind calcium in the vascular system – decreasing the risk for vascular mineralization.

cMGP levels

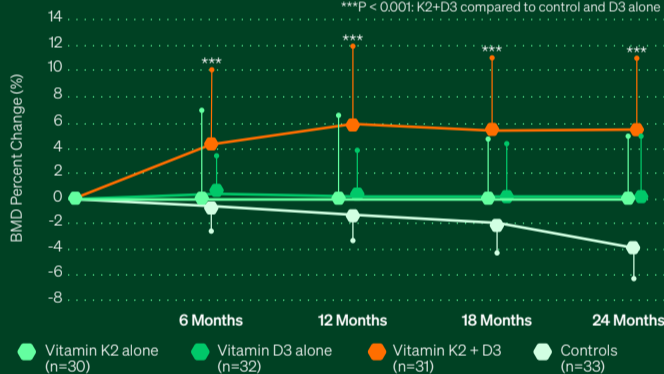


K2VITAL
and vitamin D3

The Perfect Pair combination for bone and heart health.

D3 + K2 for bone health

BMD over time ⁽³⁾



+ D3 + K2 combination significantly improves bone mineral density (BMD) in postmenopausal women, whereas D3 or K2 alone typically only limit bone loss.

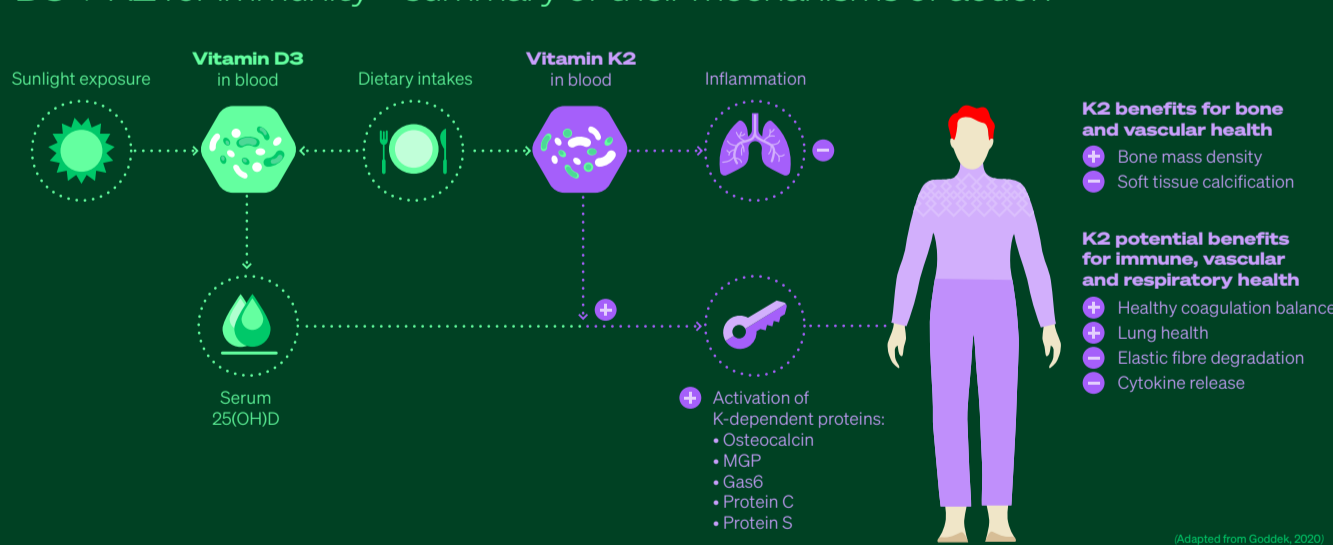
D3 + K2 for cardiovascular health

Combined association on blood pressure ⁽⁴⁾



+ The combination of low vitamin D and K status was associated with increased blood pressure and greater hypertension risk.

D3 + K2 for immunity – summary of their mechanisms of action ⁽⁵⁾



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 (2) Fu, X., Wang, X. D., Mernitz, H., Wallin, R., Shea, M. K., & Booth, S. L. (2008). 9-Cis Retinoic Acid Reduces 1α, 25-Dihydroxycholecalciferol-Induced Renal Calcification by Altering Vitamin K-Dependent γ-Carboxylation of Matrix γ-Carboxyglutamic Acid Protein in A/J Male Mice. *The Journal of nutrition*, 138(12), 2337-2341. <https://academic.oup.com/jn/article/138/12/2337/4670156>
 (3) Ushiroyama, T., Ikeda, A., & Ueki, M. (2002). Effect of continuous combined therapy with vitamin K2 and vitamin D3 on bone mineral density and coagulofibrinolysis function in postmenopausal women. *Maturitas*, 41(3), 211-221.
 (4) Van Ballegoijen, A. J., et al., (2017). Joint association of low vitamin D and vitamin K status with blood pressure and hypertension. *Hypertension*, 69(6), 1165-1172.
 (5) Goddek, S. (2020). Vitamin D3 and K2 and their potential contribution to reducing the COVID-19 mortality rate. *International Journal of Infectious Diseases*, 99, 286-290.

Key takeaways for you business

Vitamins D3 and K2 work in synergy for improved bone, cardiovascular and immune health

Vitamin D3 supports calcium absorption and initiates the expression of calcium-binding proteins. These calcium-binding proteins are inactive unless sufficient **Vitamin K2** is present to carboxylate them. For the global majority, **D3 and K2 dietary intakes are insufficient** to meet daily requirements.



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