Vitamin D3 + K2

Product Information Sheet

PRODUCT OVERVIEW

Vitamin D3/K2 was formulated to support neuroimmune balance, mental health pathways, immune regulation, and healthy inflammatory signaling. Vitamin D functions as a neuroactive steroid hormone with widespread effects on brain development, neurotransmitter synthesis, immune tolerance, and inflammation. Vitamin K2 (menaquinone-7, MK-7) works synergistically with vitamin D to support calcium regulation, skeletal integrity, and long-term vascular and neurological health.

This formulation provides a clinically relevant dose of vitamin D3 combined with the longest-acting and most bioavailable form of vitamin K2 to support sustained physiological effects.

Supplement Facts

Serving Size: 1 Capsule

Vitamin D3 (as cholecalciferol) – 5,000 IU (125 mcg)
Vitamin K2 (as menaquinone-7, MK-7) – 90 mcg

CLINICAL APPLICATIONS

- Supports mental health and mood regulation
- Supports serotonin synthesis pathways
- Supports immune modulation and immune tolerance
- Supports healthy inflammatory balance
- Supports bone mineral density and skeletal integrity
- Supports healthy aging and vascular health

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MECHANISTIC RATIONALE AND PEER-REVIEWED SUPPORT

VITAMIN D3: MENTAL HEALTH AND NEUROTRANSMITTER SUPPORT

Vitamin D receptors (VDRs) and vitamin D–activating enzymes are widely expressed throughout the brain, including regions involved in mood regulation and emotional processing. Vitamin D regulates the expression of tryptophan hydroxylase-2 (TPH2), the rate-limiting enzyme for serotonin synthesis in the brain, linking vitamin D status directly to central serotonin production [1-4].

Multiple systematic reviews and meta-analyses of randomized controlled trials demonstrate that vitamin D supplementation significantly improves depressive symptoms, particularly in individuals with baseline deficiency or clinically relevant depressive symptoms [1-5]. An umbrella meta-analysis integrating interventional and observational evidence further supports a protective association between adequate vitamin D status and depression risk [2].

Large population trials in unselected cohorts have shown more variable results, underscoring the importance of individualized assessment and targeted supplementation based on baseline status and clinical context [6]. Clinical guidelines for major depressive disorder recognize vitamin D deficiency as a modifiable contributor to depressive symptoms and overall mental health [7].

VITAMIN D3: IMMUNE REGULATION, INFLAMMATION, AND AUTOIMMUNITY

Vitamin D plays a central role in immune homeostasis by modulating both innate and adaptive immune responses. It supports regulatory T-cell activity, suppresses pro-inflammatory Th1 and Th17 signaling, and reduces production of inflammatory cytokines including TNF-α, IL-6, and IFN-γ [8-10].

Vitamin D signaling also inhibits NF-κB activation, a key transcription factor involved in chronic inflammation, and reduces microglial activation and oxidative stress within the central nervous system, supporting healthier neuroimmune communication [9-11]. Vitamin D deficiency has been consistently associated with increased risk of autoimmune conditions, immune dysregulation, and chronic inflammatory states [8-12].

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VITAMIN K2 (MK-7): SYNERGY, LONGEVITY, AND NEUROPROTECTION

Vitamin K2 activates vitamin K-dependent proteins such as osteocalcin and matrix Gla-protein (MGP), which direct calcium into bone and prevent inappropriate deposition in soft tissues and vasculature [13–15]. When combined with vitamin D, vitamin K2 supports proper calcium utilization while protecting long-term vascular health.

Menaquinone-7 (MK-7) has the longest half-life of all vitamin K forms, allowing for more stable serum concentrations and sustained biological activity with once-daily dosing [14,15]. Emerging research suggests vitamin K also plays a role in neuronal membrane integrity, sphingolipid metabolism, and protection against oxidative stress, with implications for cognitive and neurological health during aging [16,17].

WHY VITAMIN D3 AND K2 ARE COMBINED

Vitamin D increases intestinal calcium absorption, while vitamin K2 ensures that absorbed calcium is properly directed to bone and teeth rather than accumulating in arteries or soft tissues. This synergistic relationship improves both safety and long-term efficacy, particularly with higher-dose or extended vitamin D supplementation [13–15].

GENOMIC VARIABILITY AND INDIVIDUALIZED VITAMIN D REQUIREMENTS

Vitamin D requirements vary significantly between individuals due in part to genetic differences affecting vitamin D synthesis, transport, receptor signaling, and degradation. To date, multiple well-characterized single nucleotide polymorphisms (SNPs) across several genes have been shown to influence circulating vitamin D levels and tissue responsiveness, contributing to wide interindividual variability in vitamin D status [18–21].

The GC gene encodes vitamin D binding protein (DBP), the primary carrier protein responsible

for transporting vitamin D metabolites in circulation. Variants in GC can alter binding affinity and tissue delivery, and individuals with certain genotypes may require substantially higher vitamin D intake to achieve and maintain optimal serum levels [18–20].

Variants in the vitamin D receptor gene (VDR) can affect cellular responsiveness to vitamin D, influencing downstream immune, inflammatory, and neuroimmune signaling even when serum levels appear adequate [11,19]. Additionally, polymorphisms in CYP24A1, the enzyme responsible

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for vitamin D degradation, can increase vitamin D catabolism, further increasing individual requirements [21].

Collectively, at least nine well-characterized SNPs across vitamin D–related pathways have been identified that influence vitamin D synthesis, absorption, transport, receptor activity, and breakdown. Because of this genetic variability, vitamin D supplementation is best individualized and guided by laboratory monitoring of serum 25–hydroxyvitamin D in collaboration with a qualified healthcare provider.

SUPPLEMENT STACKING + TOTAL DAILY INTAKE

Vitamin D is commonly included in multiple supplements. When combining products, total daily intake should be considered.

For reference:

Neuro Nutrients Multivitamin provides 4,000 IU (100 mcg) of vitamin D per 2 capsules.

Neuro Nutrients Immune Support provides 3,750 IU (93.75 mcg) of vitamin D per 2 capsules.

Stacking supplements can be an effective way to gradually increase vitamin D intake, but cumulative dosing should be tracked and adjusted based on laboratory monitoring and provider guidance.

Directions for Use

Take 1 capsule daily with food, or as directed by your healthcare provider.

Warnings: Consult your healthcare provider prior to use, especially if you are pregnant, nursing, have a medical condition, or are taking anticoagulant medications. Vitamin D levels should be monitored when using higher-dose or long-term supplementation.

FREQUENTLY ASKED QUESTIONS

Should this supplement be taken with or without food?

Vitamin D3 and vitamin K2 are fat-soluble and are best absorbed when taken with food, especially a meal that contains healthy fats.

What is the best time of day to take Vitamin D?

Vitamin D can generally be taken at any time of day. The most important factors are consistency and taking it with food to support absorption.

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Can Vitamin D be taken once a week instead of daily?

Some individuals prefer taking vitamin D as a higher-dose, once-weekly supplement. Vitamin D is cumulative, and weekly dosing can be effective when guided by a healthcare provider. This approach is not recommended when using other Neuro Nutrients products that already contain vitamin D.

Can I take Immune Support and Vitamin D3/K2 together?

Yes, these products can be taken together. Because both contain vitamin D, total daily intake should be considered. When stacking supplements, cumulative dosing should be tracked and adjusted based on guidance from your healthcare provider and, when appropriate, blood level monitoring.

Can I take the Multivitamin (MTV), NAC, and Vitamin D3/K2 together?

Yes, these products can be taken together. The Neuro Nutrients Multivitamin and Immune Support both contain vitamin D, so when stacking supplements, it is important to consider total daily vitamin D intake. Cumulative dosing should be tracked and adjusted based on recommendations from your healthcare provider and, when appropriate, blood level monitoring.

Why does Vitamin D dosing vary between individuals?

Vitamin D needs vary based on factors such as genetics, gut health, body composition, sun exposure, and overall health. Some individuals require higher or lower doses to maintain optimal blood levels, which is why individualized guidance and periodic lab testing are recommended.

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