

Vitamin D Absorption, Part 2

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Editor's note: Part 1 of this article appeared in the [Dec. 16, 2009 issue](#).

In recent years, research has indicated that vitamin D₃ appears to have greater bioavailability than vitamin D₂. However, [a recent study](#) calls this into question.¹ Sixty-eight subjects with vitamin D deficiency were divided into four random, double-blind groups and studied over an 11-week period. One group was assigned a placebo, the second group took 1,000 IU of vitamin D₃ daily, the third group got 1,000 IU of vitamin D₂ daily, and the fourth group received a mixture of 500 IU of D₂ and 500 IU of D₃ every day. For the results of the study, please see Table 1. For how 25-hydroxyvitamin D [25(OH)D] is measured, see Table 2.

Table 1: Vitamin D₂ Versus Vitamin D₃ (nanograms per milliliter)

| Treatment | Amount of D ₃ | Number of Subjects | Baseline 25(OH)D | Final 25(OH)D | Increase (ng/ml) |
|------------------------------------|--------------------------|--------------------|------------------|---------------|------------------|
| Placebo | N/A | 14 | 18.6 | 18.8 | 0.2 |
| Vitamin D ₂ | 1,000 | 16 | 16.9 | 26.8 | 9.9 |
| Vitamin D ₃ | 1,000 | 20 | 19.6 | 28.9 | 9.3 |
| D ₂ plus D ₃ | 500 + 500 | 18 | 20.2 | 28.4 | 8.2 |

In this study, vitamin D₂ and vitamin D₃ equally raised serum 25(OH)D levels. Furthermore, the combination of both forms of vitamin D also showed no statistical difference. The most important aspect of this study to me was the fact that after 11 weeks of 1,000 IU daily, none of the groups reached the normal serum range of 30 ng/ml. In fact, the peak serum 25(OH)D concentrations were achieved after approximately six weeks and then leveled out for the remaining five weeks. One thousand IU/day of any form of vitamin D was not enough to raise 25(OH)D to low-normal levels, even though the dose was 2.5 times more than the RDA (400 IU).

Table 2: 25(OH)D Laboratory Measurements

| Measurement | Abbreviation | Conversion | Normal Range | Low | Deficient |
|----------------------|--------------|----------------|--------------|-----|-----------|
| Nanograms/milliliter | ng/ml | x 2.5 = nmol/L | 30-74 ng/ml | <30 | <20 |
| Nanomoles/liter | nmol/L | x 0.4 = ng/ml | 75-85 nmol/L | <75 | <50 |

In the meantime, studies like this show that more evidence is needed before a blanket recommendation can be made that D₂ is clearly inferior to D₃. Since most supplements use D₃ already, the primary concern of patients and providers should be the amount rather than the form. When a patient recently asked me, "Is it better for me to take 400 D₃ instead of the 400 D₂ I use

now," I replied, "Instead of buying more, just take more of what you already have."

Reference

1. Holick MF, Biancuzzo RM, Chen TC, et al. [Vitamin D₂ is as effective as vitamin D₃ in maintaining circulating concentrations of 25-hydroxy vitamin D.](#) *J Clin Endocrinol Metab*, 2008;93:677-81.

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