



ON CALL

Vitamin D₂ or D₃?

Q After reading your article on multivitamins, I've decided to switch from my old multivitamin to plain vitamin D. But I'm confused by the various types of vitamin D. Which kind should I take?

A You are wise to take vitamin D, but even wise men are likely to be confused by the complexities of vitamin D.

Vitamin D is essential for health. Its most well-established role is to increase the intestinal absorption of calcium, keeping bones strong. But important research also raises the hope that vitamin D may help protect against prostate cancer and other malignancies, muscular weakness and falling, heart disease, and other disorders (see *Harvard Men's Health Watch*, February 2007).

Vitamin D is the only one of the 13 vitamins that can be made by the human body. (Small amounts of vitamin K are produced by intestinal bacteria.) The process starts when the ultraviolet energy in sunlight acts on a form of cholesterol (*7-dehydrocholesterol*) in the skin. The result is vitamin D₃. But before D₃ can function, it must travel to the liver and then the kidneys to undergo further conversions. The end product is active vitamin D, known technically as *1,25-dihydroxyvitamin D*, or *calcitriol*.

Many Americans are deficient in vitamin D because they don't get enough sunlight to make vitamin D₃ in the skin. That's not all bad, since excessive sun exposure leads to premature wrinkling and skin aging as well as malignant melanomas and other skin cancers.

A good diet will provide adequate amounts of all the vitamins except D. Fish and shellfish provide some vitamin D (oily fish are best). And egg yolks have a tiny amount. Fortified dairy products have added vitamin D—but very few of us get the D we need from diet. That's no surprise when you realize that you need to consume about 5 ounces of salmon, 7 ounces of halibut, two 8-ounce cans of tuna, or a quart of milk to get 400 international units (IU) of vitamin D, which is only about half of what many experts recommend.

If you don't get enough sunlight to make the vitamin D you need, and your diet can't make up the rest, you need a supplement. Two forms are widely available. Vitamin D₂ is produced by exposing *ergosterol* from yeast to ultraviolet light, while D₃ can be obtained from fish or by exposing lanolin from sheep's wool to ultraviolet rays.

Both D₂ and D₃ have to pass through your liver and kidneys to be converted to the active form of vitamin D. But which is best? Vitamin D₂ has been the mainstay of therapy for over 80 years and is the only form in prescription preparations. But both D₂ and D₃ are available as over-the-counter supplements.

A 2004 study suggested that D₃ was better, but it tested only a single 50,000 IU megadose of each preparation. A more realistic 2008 trial evaluated a 1,000 IU daily dose of D₂ or D₃, a supplement that combined 500 IU of each, and a placebo. The subjects were 68 healthy adults age 18 to 84. Interestingly, 60% of them were vitamin-D deficient at the start of the trial. At the end of 11 weeks, though, D₂ and D₃ were equally effective at boosting blood levels of D.

Pick whichever form of D is easier to find, but be sure to get enough. The Recommended Dietary Allowance (RDA) for adults younger than 51 is 200 IU, for 51- to 70-year-olds it's 400 IU, and for people over 70, it's 600 IU. But many experts recommend 800 to 1,000 IU a day. Doses up to at least 2,000 IU a day are considered safe.

All in all, the choice between D₂ and D₃ is less important than getting the right "D" dose.

HBS



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