

## IOM Report Sets New Dietary Intake Levels for Calcium and Vitamin D To Maintain Health and Avoid Risks Associated With Excess

Most Americans and Canadians up to age 70 need no more than 600 international units (IUs) of vitamin D per day to maintain health, and those 71 and older may need as much as 800 IUs, says a new report from the Institute of Medicine released Nov. 30, 2010. The amount of calcium needed ranges, based on age, from 700 to 1,300 milligrams per day, according to the report, which updates the nutritional reference values known as Dietary Reference Intakes (DRIs) for these interrelated nutrients.

The report's recommendations take into account nearly 1,000 published studies as well as testimony from scientists and stakeholders. A large amount of evidence, which formed the basis of the new intake values, confirms the roles of calcium and vitamin D in promoting skeletal growth and maintenance and the amounts needed to avoid poor bone health. The committee that wrote the report also reviewed hundreds of studies and reports on other possible health effects of vitamin D, such as protection against cancer, heart disease, autoimmune diseases, and diabetes. While these studies point to possibilities that warrant further investigation, they have yielded conflicting and mixed results and do not offer the evidence needed to confirm that vitamin D has these effects. Rigorous trials that yield consistent results are vital for reaching conclusions, as past experiences have shown. Vitamin E, for example, was believed to protect against heart disease before further studies disproved it.

"There is abundant science to confidently state how much vitamin D and calcium people need," said committee chair Catharine Ross, professor and Dorothy Foehr Huck Chair, department of nutritional sciences, Pennsylvania State University, University Park. "We scrutinized the evidence, looking for indications of beneficial effects at all levels of intake. Amounts higher than those specified in this report are not necessary to maintain bone health."

The science on calcium's role in bone health shows that 700 milligrams per day meets the needs of almost all children ages 1 through 3, and 1,000 milligrams daily is appropriate for almost all children ages 4 through 8. Adolescents ages 9 through 18 require no more than 1,300 milligrams per day. For practically all adults ages 19 through 50 and for men until age 71, 1,000 milligrams covers daily calcium needs. Women starting at age 51 and both men and women age 71 and older need no more than 1,200 milligrams per day.

As for vitamin D, 600 IUs daily meets the needs of almost everyone in the United States and Canada, although people 71 and older may require as much as 800 IUs per day because of potential physical and behavioral changes related to aging.

The majority of Americans and Canadians are getting enough vitamin D and calcium, the committee determined from reviewing national surveys of blood levels. Some adolescent girls may not get quite enough calcium, and there is a greater chance that elderly individuals may fall short of the necessary amounts of calcium and vitamin D. These individuals should increase their intake of foods containing these nutrients and possibly take a supplement.

Confusion about the amount of vitamin D necessary to ward off deficiency has arisen in recent years as tests that measure levels in patients' blood have become widely used. The measurements of sufficiency and deficiency – the cutpoints – that clinical laboratories use to report test results have not been based on rigorous scientific studies and are not standardized. This lack of agreement means the same individual could be declared deficient or sufficient depending on which laboratory reads the test. There may be an overestimation of the number of people with vitamin D deficiency because many labs appear to be using cutpoints that are higher than the evidence indicates are appropriate. Based on available data, almost all individuals get sufficient vitamin D when their blood levels are at or above 20 nanograms per milliliter as it is measured in America, or 50 nanomoles per liter as measured in Canada.

Although sunlight triggers the natural production of vitamin D in skin and contributes to people's vitamin D levels, individuals' sun exposure varies greatly and many people are told to minimize their exposure, so the committee assumed minimal sun exposure to establish the DRIs. The new intake levels for vitamin D cover the needs of individuals who get little sun.

Greater amounts of food fortification and rising rates of supplement use have increased the chances that people consume high amounts of these nutrients. Getting too much calcium from dietary supplements has been associated with kidney stones, while excessive vitamin D can damage the kidneys and heart. Evidence about other possible risks associated with routine vitamin D supplementation is still tentative, and most studies have focused on very high doses taken short term rather than on routine, long-term consumption of large amounts. However, some signals suggest there are greater risks of death and chronic disease associated with long-term high vitamin D intake, which informed the committee's conclusions about levels that consumers should not exceed.

Upper intake levels represent the upper safe boundary and should not be misunderstood as amounts people need or should strive to consume. The upper intake levels for vitamin D are 2,500 IUs per day for children ages 1 through 3; 3,000 IUs daily for children 4 through 8 years old; and 4,000 IUs daily for all others. The upper intake levels for calcium are 2,500 milligrams per day from age 1 through 8; 3,000 milligrams daily from age 9 through 18; 2,500

milligrams daily from age 19 through 50; and 2,000 milligrams per day for all other age groups.

"While it is too early to make definitive statements about the risks associated with routine high doses of vitamin D and calcium, people don't need more than the amounts established in this report," Ross said. "Past cases such as hormone replacement therapy and high doses of beta carotene remind us that some therapies that seemed to show promise for treating or preventing health problems ultimately did not work out and even caused harm. This is why it is appropriate to approach emerging evidence about an intervention cautiously, but with an open mind."

The new DRIs are based on much more information and higher-quality study results than were available when the DRIs for these nutrients were first set in 1997. At that time, limitations in the evidence resulted in intake levels called Adequate Intakes, which are rougher estimations of people's requirements than the new values. The old and new DRIs reflect different calculations and are not directly comparable.

The study was sponsored by the U.S. Department of Health and Human Services, U.S. Department of Agriculture, U.S. Department of Defense, and Health Canada. The complete report can be found at <http://www.iom.edu/Reports/2010/Dietary-Reference-Intakes-for-Calcium-and-Vitamin-D.aspx>