

Health Insights Today

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Calcium, Dairy and Bone Health

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People growing up in the United States have been taught since childhood that bones are primarily made of calcium, that the best dietary sources of calcium are milk and other dairy products, and that consuming these in substantial amounts on a daily basis is necessary to build strong bones. This message, presented to us for decades by doctors, teachers, government agencies and countless advertisements, now resides deep into our national health psyche.

Are these claims and recommendations accurate and health-affirming? Does the peer-reviewed scientific literature offer strong support, mild support, or no support at all? If you aren't sure, you are not alone.

Let's look at the evidence.

First, we should stipulate the basics. It is undeniably true that dairy products contain substantial amounts of calcium (300 milligrams in a cup of milk or yogurt, 200 mg in an average portion of cheese). Second, it is true that the mineral content of bone is mainly comprised of calcium (along with phosphorus and other nutrients). Third, there is substantial documentation that building up sufficient bone mass in one's early years provides crucial insurance against bone loss in later years. Just as saving up money in good times is a hedge against times of economic difficulty, building strong bones in youth means that some bone loss in later years can be handled without the risk of disabling fractures of the hip or other weight-bearing bones.

Does High Calcium Intake Lead to Strong Bones?

Putting these facts together, it would seem logical to assume that people who consume large amounts of calcium (from dairy products, supplements, or other sources) from childhood onward will have the best bone strength and in later years enjoy the greatest protection against osteoporosis-related fractures.

Scientific research has shown this to be untrue. Even more strangely, there is evidence that the opposite is true.

People in nations that have the highest dairy intake and the highest calcium intake have the *highest* osteoporosis-related fracture rates, not the lowest. This information has been available in scholarly nutrition research journals since at least the mid-1980s,¹ and recent studies² confirm the fundamental point. Moreover, the World Health Organization recommends a calcium intake that is around half of what the U.S. government recommends, for people not living in Western nations. Even for people in the West (whose diets are presumed to be high in meat and whose lifestyles are presumed to be low in exercise), the WHO recommends calcium intake (800 mg) at a level well below current U.S. recommendations (1000-1300 mg).

What are we to make of this? If you're being exposed to this information for the first time, I understand that it may seem like I've just told you that the sky isn't really blue or that ocean water is actually just fine to drink.

Extraordinary Evidence

There's an oft-quoted adage in scientific circles, "Extraordinary claims require extraordinary evidence." Therefore, in support of these assertions that may seem extraordinary, let me quote from a recent (mid-2008)

Health Insights Today

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Late Fall 2008, Volume 1, Issue 4

Page 2

issue of HEALTHBeat, an e-newsletter from a widely-respected source, the Harvard Medical School (free email subscription at HEALTHbeat@hms.harvard.edu):

“For years, high calcium intake has been portrayed as one of the best things you can do to prevent osteoporosis and related fractures. But when researchers started to crunch the data from large, prospective studies that followed people for many years, the benefits weren’t so clear-cut. These findings led to randomized trials of calcium to test what effect it might have on fracture rates.

“The tide started to turn in 2005 when results from two British studies showed that calcium didn’t prevent fractures—even when taken in combination with vitamin D. The next year, results from a large American trial, the Women’s Health Initiative, showed that postmenopausal women who took a calcium–vitamin D combination were no less likely to break a hip than women who took a placebo pill, although the density of their hip bones increased slightly. In 2007, a Swiss and American team, including some researchers from Harvard, reported the results of a meta-analysis of over a dozen studies of calcium. They found no connection between high calcium intake, from either food or pills, and lower hip fracture risk. In fact, when they limited their analysis to four randomized clinical trials with separate results for hip fractures, they found that extra calcium *increased* the risk.”

Bottom line: we don’t need anywhere near as much calcium as the U.S. government and the dairy industry have been recommending. High intake may even be harmful. If it adheres honestly to the overwhelming weight of scientific evidence, the federal government will revise downward its recommendations on calcium and dairy products in the coming years.

Best Sources of Calcium

Walter Willett, PhD, chair of the Harvard School of Public Health’s nutrition department, who is widely recognized as one of the world’s leading experts on the role of nutrition in health promotion and disease prevention, is quoted in the same issue of HEALTHBeat referring to “real drawbacks to overdoing calcium, especially if dairy foods are the source,” specifically noting “studies linking high consumption of dairy products to ovarian and prostate cancer ... particularly strong for metastatic and fatal prostate cancer.”

If dairy products bring risks as well as possible benefits, what other sources of calcium are available? The answer is *greens and beans*. Greens, of course, are where dairy cows get their calcium. And while we humans can’t digest grass, we do a very good job at digesting nutritious green leafy vegetables like kale, collards, and chard (spinach is nutritious, but its calcium isn’t readily accessible), as well as broccoli, almonds, soy, and all sorts of beans. As always, the key is to find recipes for these foods that you truly enjoy.

What Does Build Strong Bones?

At this point, you may be wondering, “If a high intake of calcium is not the key to building strong bones, what is?” The answer is two-fold: weight-bearing exercise and Vitamin D (from sunshine or supplements). [An excellent summary of the scientific research on this subject](#), focused primarily on building healthy bones in youth, appeared in 2005 in *Pediatrics*.³ (We plan to explore Vitamin D in greater detail in a future issue, but if you need more information now, [this article](#) from the *American Journal of Clinical Nutrition* is dependable and wide-ranging).

Health Insights Today

A SERVICE OF THE CLEVELAND COLLEGE FOUNDATION

Late Fall 2008, Volume 1, Issue 4

Page 3

The take-home message of the *Pediatrics* article is that encouraging children and adolescents to enjoy active play outdoors (exercise plus sunshine vitamin D) is more important than having them drink milk or consume other dairy products, as long as they get enough calcium from other sources. Remember, it's possible to do too much of a good thing, so we should take care not to let our kids (or ourselves) overdo sun exposure at peak hours of the day. For adults and children alike, exercise (including the weight-bearing kind) is crucial. And for people of all ages, a balanced whole foods diet is essential to well-being.

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