

Good Medicine

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New PCRM Study Shatters Milk Myth: Children's Bone Health Tied to Exercise, Not Dairy

By Amy Joy Lanou, Ph.D.

For years, the dairy industry's milk mustache ads have pushed the notion that milk drinking helps children grow strong bones. A review published in the March 2005 issue of *Pediatrics* by PCRM senior nutrition scientist Amy Joy Lanou, Ph.D., and co-authors Neal Barnard, M.D., and Susan Berkow, Ph.D., C.N.S., shows there is little scientific evidence to support the claim. The authors also call into question the artificially high calcium recommendations propagated by the U.S. government.

Epidemiologists have long known that countries with the highest dairy product consumption, such as the United States and Finland, suffer from high osteoporosis and fracture rates. And findings from studies in women, children, and adolescents also have raised questions about the use of dairy products in the promotion of bone health.

World Health Organization recommendations for preventing osteoporosis acknowledge this "calcium paradox." The agency advises that individuals 50 years of age or older from countries with a high fracture incidence only consume a minimum of 400–500 mg of calcium daily, far less than the current—and inflated—U.S. government recommendations, which range from 800 to 1,300 mg of calcium daily for all ages.

Weighing the Evidence

To better understand the "calcium paradox" and the difference in calcium recommendations, we reviewed all of the studies published since 1966 (58 in all) that addressed the effect of dairy products and other calcium-containing foods or supplements on bone integrity in children, adolescents, and young adults.

We asked two questions. First, is there sufficient evidence to support the current U.S. recommended adequate intake levels of calcium? And second, is there support in the literature for the widely promoted claim that milk and other dairy products are better for promoting bone integrity than other calcium sources?

Of the 58 studies, we rejected 11 because they did not have adequate controls, meaning that they did not take into account weight, pubertal status, and/or exercise—three important factors known to influence bone integrity. We evaluated 10 additional clinical trials separately because they utilized calcium supplements, not dairy. (Of these, nine showed a small increase in bone density during treatment, but this effect was transient and not maintained past the treatment period.)

Of the remaining 37 studies of dairy or unsupplemented dietary calcium intake in children, adolescents, and young adults, 27 studies (or 72 percent) found no relationship between dairy or dietary calcium intake and measures of bone health.

In the remaining nine reports, the effects on bone health were small. Three were unclear because the dairy products consumed were fortified with vitamin D, which itself is known to affect bones; six found positive relationships in some measures but not others; and one found an effect of increasing dietary calcium intake on bone mineral density only when habitual calcium intake was very low—less than 400 mg per day.

No Evidence to Support Milk Claims

In summary, we found that the vast majority of controlled studies of dairy supplementation or total dietary calcium intake show that, while very low calcium intakes (e.g., below 400 mg per day) may be harmful to bone development, increases in dairy or total dietary calcium intake (above 400 to 500 mg per day) are not correlated with, or a predictor of, bone mineral density or fracture rate in children or young adults.

In fact, we found no evidence to support the notion that milk is a preferred source of calcium. While milk and other dairy products contain calcium, many factors affect the availability and retention of the calcium from these products.

Calcium in Plant Foods Is Better Absorbed

For example, the calcium in dairy products is not as well absorbed as that in many dark green leafy vegetables, but has an absorption fraction similar to that of calcium supplements, calcium-enriched beverages, calcium-set tofu, sweet potatoes, and beans. One cup of cooked kale or turnip greens, $\frac{2}{3}$ cup of tofu, or $1\frac{2}{3}$ cups of broccoli provide the same amount of absorbable calcium as 1 cup of cow's milk (as would 1 cup of fortified orange juice, soymilk, or Basic 4 cereal).

Dairy products also contain nutrients that interfere with calcium balance. Dairy protein and sodium increase the urinary excretion of calcium.

Kids Need Exercise, Sunshine, and Healthy Diet

If dairy products don't help kids grow strong bones, what does?

Studies show that physical activity has the greatest positive impact on adolescents' bone health. In addition, spending some time in the sunlight, avoiding smoking and high salt and caffeine intakes, and eating lots of fruits and vegetables are all good strategies for supporting healthy bone development and maintenance. It is also a good idea for children and adults to get at least 400 to 500 mg calcium per day from plant sources such as beans, greens, whole grain bread, tortillas, fortified juices, cereals, or nondairy milks.

For more information on helping children build healthy bones, visit www.strongbones.org. To order a free copy of *Parents' Guide to Building Better Bones* or a reprint of the *Pediatrics* paper, please email literature@pcrm.org or call 202-686-2210, ext. 306.

Lanou AJ, Berkow SE, Barnard ND. Calcium, dairy products, and bone health in children and young adults: a reevaluation of the evidence. *Pediatrics*. 2005;115:736-43.

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