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Dairy Products and Bone Health

To the Editor:

In their review, "Is Calcium and Vitamin D Supplementation Overrated?," Lee and Majka ask a critically important question. However, their answer ignored key scientific evidence (1). Their recommendation to consume three 8-oz glasses of vitamin D–fortified milk per day to meet the minimum requirements for calcium and vitamin D is especially problematic, since most research shows that dairy products are not beneficial to bone health.

The Nurses' Health Study (2), which followed more than 75,000 women for 18 years, showed no protective effect of increased milk consumption on fracture risk. Similarly, a 1994 study of elderly men and women in Sydney, Australia, showed that higher dairy product consumption was associated with increased fracture risk. Those with the highest dairy product consumption had approximately double the risk of hip fracture compared with those with the lowest consumption (3).

The high rate of osteoporosis in the United States has more to do with excessive protein consumption, along with a sedentary lifestyle and tobacco and alcohol use, than with any "deficiency" of cow's milk. Acidic animal protein leads to urinary excretion of calcium and the consequential loss of calcium from the bone. Because of this major influence of protein on calcium balance, the World Health Organization makes two sets of recommendations: one for people consuming a typical Western diet high in animal protein, and a second for those consuming a diet that is lower in animal protein. For the former, 1,000 mg of calcium is recommended for females from 19 years of age to menopause; for the latter, 750 mg of calcium is recommended (4).

Healthful, plant-based sources of calcium include kale, broccoli, and other green leafy vegetables that contain readily absorbable calcium. A recent report found that "greens such as kale can be considered to be at least as good as milk in terms of their calcium absorbability" (5).

An elevated risk of prostate cancer has been associated with dairy consumption (6,7), and the same may be true for ovarian cancer (8). Lactose intolerance, a commonly overlooked condition, affects an overwhelming majority of many minority populations, as well as about 15% of whites (9).

Just as cow's milk is fortified with vitamin D, so are dairy alternatives, including soy and rice milks and some juices. Exposure to sunlight will also provide the vitamin D necessary for strong bones.

Milk and dairy products are not necessary in the diet and can, in fact, be harmful. By consuming a healthful diet of grains, fruits, vegetables, legumes, and fortified foods, including cereals and juices, one can meet calcium and vitamin D requirements with ease—and without the health risks associated with dairy products.

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Authors' Response:

We appreciate the comments of Levin and agree that calcium and vitamin D may be obtained from sources other than fortified dairy products. Accordingly, our statement regarding the consumption of three 8-oz glasses of vitamin D–fortified milk per day only served to illustrate how readily the recommended daily requirements of calcium and vitamin D can be met. Moreover, the focus of our commentary (1) was to highlight the benefits of calcium and vitamin D rather than to detail all the dietary sources of these nutrients or to assert the health benefits and risk of a Western diet.

While some studies have shown that consumption of dairy products may have no protective effect (2) or increased risk for fractures, the majority of investigative data support a beneficial effect on bone health, particularly in younger age groups (3). For example, previous randomized controlled trials found that milk consumption was associated with increased bone mineral density (4,5). In addition, Johnell and colleagues found that low milk consumption was associated with hip fracture in 2,800 women aged 50 years and older (6).

Therefore, the view that dairy products are not beneficial to bone health, as suggested by Levin, is debatable.

Levin also contends that the high rate of osteoporosis in the United States is largely due to other factors such as excessive consumption of protein or alcohol and tobacco use, rather than a result of inadequate consumption of milk. Although high protein intake increases urinary calcium loss, when the effects of dietary protein on bone loss are measured, lower protein intake, including lower animal protein intake, are significantly related to increased bone loss (7-9). In addition, in the World Health Organization report cited by Levin, the level of evidence for increased risk of osteoporotic fractures from high protein intake was graded as a "possible" risk factor. The report also identified low protein intake in the elderly as a "possible" risk factor for osteoporotic fractures (10). Thus, the relationship between protein consumption and bone health remains unclear. Smoking and excessive alcohol use are independent risk factors for osteoporosis (11,12). In the case of alcohol use, the rate of excessive alcohol intake is low as compared to the prevalence of osteoporosis (7,13), and moderate alcohol consumption does not appear to affect bone mineral density, whereas modest consumption of alcohol has been associated with higher bone mineral density (14).

Although dairy consumption has been associated with some cancers, such as prostate and ovarian cancer, most of the available evidence is based on observational data and if any association exists, the relationship is modest (15,16). Conversely, the majority of the published evidence reflect no relationship between dairy consumption, including milk, and cancers, whereas some studies suggest a risk reduction of specific cancers among dairy consumers (17). Therefore, any definitive cause and effect relationship between the consumption of dairy products and some cancers as indicated by Levin is inconclusive at best.

Sources of calcium and vitamin D other than milk are available and nondairy sources of these nutrients can be included as part of a healthful diet. However, given that many individuals can consume dairy products, including milk, and based on the inadequate evidence to suggest that dairy products are wholly unhealthful sources of calcium and vitamin D, dairy products remain an acceptable dietary source of these nutrients.

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