

# DAIRY'S ROLE IN BONE HEALTH

## Reducing the Risk of Osteoporosis

One of the most important reasons to consume three servings of dairy – milk, cheese, and yogurt – each day is to help build and maintain strong bones at all ages. Numerous studies have identified calcium intake and dairy foods as a key dietary strategy for attaining peak bone mass and for preventing and treating osteoporosis and reducing fracture risk. In addition to calcium, other nutrients found in dairy foods such as protein, phosphorus, magnesium, and vitamin D also support bone health.

Two important government reports have recognized the role in dairy in building bone strength. In 2004, the U.S. Surgeon General called for all Americans to take action to improve and maintain healthy bones. He urged people of all ages to meet daily requirements for calcium and vitamin D with three glasses of low-fat milk each day. The 2005 Dietary Guidelines for Americans recognized that people who consume more dairy foods have better overall diets, consume more nutrients and have improved bone health.

- A report by the American Academy of Pediatrics (AAP) recommends drinking three 8-oz glasses of milk per day (or the equivalent) to achieve the recommended adequate intake of calcium and vitamin D in children 4 to 8 years of age, and four 8- to 10-oz glasses of milk (or the equivalent) to achieve the adequate calcium and vitamin D intake for adolescents. The AAP suggests getting calcium from dairy foods first such as milk, flavored milk, cheese and yogurt, with an emphasis on low-fat or fat-free varieties, to help build strong bones and reduce the risk of fractures and osteoporosis later in life. The report also stresses the importance of parental role modeling, physical activity and the call for pediatricians to regularly assess their patients' calcium intake.

American Academy of Pediatrics, Optimizing bone health and calcium intakes of infants, children, and adolescents. *Pediatrics*. 2006; 117 (2): 578-585.

- The 2005 Dietary Guidelines for Americans identified seven “nutrients of concern” of which Americans have low intakes. Dairy foods supply four of the seven nutrients of concern for adults: calcium, potassium, magnesium, vitamin A; and three of the five nutrients of concern for children: calcium, magnesium, potassium.

U.S. Department of Health and Human Services and U.S. Department of Agriculture. *Dietary Guidelines for Americans*, 2005. 6th Edition, Washington, DC: U.S. Government Printing Office, January 2005.

- The 2004 Report of the Surgeon General noted the role of several nutrients in dairy with potentially beneficial effects on bone including calcium, vitamin D, magnesium, phosphorus, potassium and protein.

Surgeon General's Report on Bone Health, 2004. <http://www.surgeongeneral.gov/library/bonehealth/>.

- Calcium is one of the nutrients most likely to be lacking in the American diet. According to government statistics nearly nine out of 10 women and four out of 10 men fall short of calcium recommendations.

What We Eat in America, NHANES 2001-2002 : Usual Nutrient Intakes from Food Compared to Dietary Reference Intakes; <http://www.ars.usda.gov/foodsurvey>

- Adequate calcium and vitamin D intake are crucial to develop optimal peak bone mass and to preserve bone mass throughout life.

NIH Consensus Development Program. Consensus Statements. *Osteoporosis Prevention, Diagnosis and Therapy*. March 27-29, 2000; 17(1): 2.

- Osteoporosis is a major public health threat for an estimated 44 million Americans. In the United States today, 10 million individuals are estimated to already have the disease and almost 34 million more are estimated to have low bone mass, placing them at increased risk for osteoporosis.  
National Osteoporosis Foundation, 2004. <http://216.247.61.108/osteoporosis/diseasefacts.htm>.
- This longitudinal study examined the association between calcium intake and bone mineral content of 151 non-Hispanic white girls by measuring dietary intake and bone mineral content from ages 5 to 11. Results showed that calcium intake over time positively affected bone mineral content accrual during middle childhood.  
Fiorito LM, et al. Girls Calcium Intake and Bone Mineral Content During Middle Childhood. *Journal of Nutrition*. 2006; 136: 1281-1286.
- A research review of 138 studies exploring the relationship between bone health and calcium intake establishes that high calcium and more specifically, dairy food intake throughout life increases peak bone mass and slows age-related bone loss.  
Heaney RP. Calcium, dairy products and osteoporosis. *Journal of the American College of Nutrition*. 2000; 19: 83S-99S.
- Dairy products provide a unique mix of nutrients including calcium, phosphorus and protein that contribute to maximizing bone density and slowing age-related bone loss.  
Ilich JZ, et al. Nutrition in Bone Health Revisited: A Story Beyond Calcium. *Journal of the American College of Nutrition*. 2000; 19(6): 715-37.
- Almost all processed fluid milk in the United States is fortified with vitamin D to obtain the standardized amount of 400 IU per quart, making milk one of the primary sources for this nutrient. The important effects vitamin D has on bone health throughout the lifecycle, including during fetal development was discussed by the Nutrition and Bone Health Working Group at the American Society for Bone and Mineral Research Annual Meeting. It was noted that children born to mothers who have low vitamin D levels have significantly reduced bone mineral content at age 9 years. In addition, vitamin D deficiency jeopardizes the attainment of peak bone mass in youth and increases bone loss in adults – both of which increase the likelihood of osteoporosis later in life.  
Holick M. The Influence of vitamin D on bone health across the life cycle. *Journal of Nutrition*. 2005; 135: 2726S-2727S.
- A multicenter, randomized, controlled trial found that by drinking three servings of fat-free or low-fat milk each day, older adults could significantly improve their skeletal health. Additionally, this dietary change - which increased daily calcium intake by about 750 milligrams - helped improve the overall quality of their diets.  
Heaney RP, et al. Dietary changes favorably affect bone remodeling in older adults. *Journal of the American Dietetic Association*. 1999; 99: 1228-33.
- A recent study concluded that women with low milk intake during childhood and adolescence have less bone mass in adulthood and greater risk of fracture.  
Kalkwarf HJ, et al. Dietary changes favorably affect bone remodeling in older adults. *American Journal of Clinical Nutrition*. 2003; 77: 257-265.
- The 2004 Surgeon General's Report on Osteoporosis and Bone Health recognizes that most Americans do not consume adequate levels of calcium and recommends lifestyle changes for all Americans through regular physical activity and consumption of calcium- and vitamin D-rich foods, such as milk, cheese or yogurt, each day.  
U.S. Department of Health and Human Services. *Bone Health and Osteoporosis: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General, 2004.

Additional resources are available at [www.nationaldairycouncil.org](http://www.nationaldairycouncil.org).

Call (312) 240-2880 for more information.

©2006 NATIONAL DAIRY COUNCIL®