

CALCIUM- AND VITAMIN D-FORTIFIED DAIRY FOODS IMPROVE BONE DENSITY IN POSTMENOPAUSAL WOMEN

Researchers in Greece compared the effectiveness of supplementing the diets of postmenopausal women with calcium and vitamin D-fortified dairy foods to supplementing with calcium alone on bone mineral density (BMD). One hundred-one postmenopausal women (55-65 years) were randomly assigned to a dairy group (DG), a calcium supplement group (CaG), or a control group (CG). The researchers advised the women assigned to the DG to consume three servings of low-fat milk and yogurt fortified with 400 mg calcium/serving and 2.5 µg of vitamin D₃ /serving as part of their usual diet. The women substituted the fortified dairy foods for the dairy products they had previously consumed. The goal was to provide each woman with the recommended daily intake of calcium (1,200 mg) and vitamin D (7.5 µg vitamin D). Women in the calcium supplement group took 600 mg of supplementary calcium per day to achieve a minimum daily calcium intake of 1,200 mg. The women in the control group followed their usual diet. BMD of the pelvis, spine, and total body was measured at baseline and at the end of 12 months by dual-energy X-ray absorptiometry (DXA). BMD of the heel was assessed by quantitative ultrasound.

This study found that consumption of the “recommended intakes of calcium and vitamin D₃ via fortified dairy products for 12 months can induce favorable changes in pelvis, total spine, and total body BMD in postmenopausal women”. These changes were more favorable than those observed in the other dietary treatment groups (CaG, CG). Supplementation with calcium alone (CaG) did not produce any favorable changes in BMD. Those in the CG experienced significant decreases in total spine and total body BMD. Those in the DG had increased intakes of protein, magnesium, and vitamin D compared with those in the other groups. There were no differences in energy intake or changes in body mass index between groups. The quantitative ultrasound technique did not detect any BMD changes either within or between groups.

The authors conclude, “The current study revealed that the application of a holistic approach combining dietary intervention and consumption of fortified dairy products for a period of 12 months can induce favorable changes in pelvis, total spine and total body BMD of postmenopausal women but not in QUS (quantitative ultrasound) parameters, which probably require longer intervention periods to reach a significant level.” The authors attribute the favorable effect of dairy foods not only to calcium and vitamin D, but to other nutrients in dairy foods important for bone metabolism, such as potassium, magnesium, and vitamin A, saying that “milk ingredients as a whole may be more effective than the sum of its individual parts.” [Moschonis G and Manios Y, *British J Nutr*, 96: 1140-1148, 2006]

CALCIUM INTAKE AND PHYSICAL ACTIVITY IMPROVE INDICATORS OF BONE STRENGTH IN OLDER WOMEN

Hip geometry is an important factor in determining bone strength and fracture risk. Researchers in Australia investigated the effects of physical activity and calcium intake on various aspects of hip geometry in a cross-sectional study of more than 1,000 75-year-old women. Results showed a significant dose-response positive effect of physical activity on indices of axial compression strength at all three hip sites measured (femoral neck, intertrochanter, and femoral shaft) and of bending strength at two sites (femoral neck and intertrochanter). Calcium showed a positive dose-response effect on one factor measured (the centroid position of the intertrochanter). The individual effects of habitual physical activity and calcium intake were additive. Women who expended more than 65.5 kcal per day in physical activity and who consumed more than 1039 mg of calcium per day had significantly greater indices of axial compression and bending strength in their hip. This level of physical activity and calcium intake was met by about one quarter of the women in the study. "This study," conclude the authors, "has identified positive associations between aspects of femoral geometry related to bone strength and the modifiable lifestyle variables, habitual physical activity and dietary calcium intake. These results broadly support current public health guidelines for physical activity and dietary calcium intake." [Nurzenski MK, et al., *J Bone Min Res*, 22(3): 416-424, 2007]