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BONE, BONE MARKERS AND THE RESPONSE TO DAIRY FOODS AND OTHER NUTRIENTS IN OLDER WOMEN

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Bone is a metabolically active tissue that undergoes continuous remodelling involving the coupled processes of resorption and formation. Biochemical markers reflect acute changes in bone turnover and are, therefore, useful to measure the effects of short-term nutritional interventions on bone turnover, before changes in bone mass would be evident. A number of different bone markers have been used in nutritional and pharmaceutical studies. Recently, two bone markers have been recommended as standards for measuring bone turnover to allow better comparison of findings between studies: collagen type I cross-linked C-terminal telopeptide (CTX), for bone resorption; and type I amino terminal pro-peptide of type I collagen, for bone formation. Accelerated bone loss occurs in early menopause, as bone resorption exceeds formation and bone loss continues into older age at a slower rate. Consequently, post-menopausal and older women are at increased risk for osteoporosis and associated fractures; Asian women are particularly at risk for adverse bone health outcomes due to low habitual calcium intakes and 25-hydroxyvitamin D3 levels. Interventions in groups of elderly Caucasian and post-menopausal Asian women that provided milk- or dairy-based supplements, fortified with calcium and/or vitamin D, have demonstrated positive relationships between supplementation and bone health. Acute changes in bone markers were used as measures of bone turnover to predict the potential for longer-term changes in bone mass. Not all associations reached statistical significance; however, a significant reduction in the bone resorption marker CTX was most consistently observed. Bone biomarkers have also been of use in monitoring the effects of other nutrients and foods on bone turnover. To this effect, green kiwifruit reduced the levels of uncarboxylated osteocalcin over 6 weeks and fruit and vegetables reduced CTX levels over 3 months in postmenopausal women. Further research is also aiming to identify novel markers based on metabolomics analyses of serum.

Biography

Marlena Kruger is Professor of Nutritional Physiology and Associate Dean: Higher Degree Research for the College of Health at Massey University, New Zealand. She was appointed as Associate Professor in Physiology at the University of Pretoria in 1991 after spending time in Germany on a DAAD scholarship and as Post-doctoral fellow at the University of Texas in Austin. She worked at Massey University in April 2000. She progressed to Associate Professor in 2002, Director of the Division of Human Nutrition and her current position as Chair in Nutritional Physiology in 2005 and progressed to Associate Dean in 2017. She has over 140 book chapters and publications in international peer reviewed journals. Her current research focus is Nutrition and Bone and Joint Health with an emphasis on Lipids, Dairy Foods and Polyphenols.

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