

**The effect of altering n-6: n-3 ratio using plant and marine sources of n-3 fatty acids on biomarkers of bone turnover**

Sujatha Rajaram<sup>1</sup>, Lan Nguyen<sup>1</sup>, Subburaman Mohan<sup>3</sup>, Keiji Oda<sup>2</sup>, Joan Sabaté<sup>1</sup>. <sup>1</sup>Department of Nutrition, <sup>2</sup>Department of Epidemiology and Biostatistics, Loma Linda University, Loma Linda, CA, <sup>3</sup>Musculoskeletal Disease Center, Jerry L. Pettis VA Medical Center, Loma Linda, CA

While research indicates that the intake of n-3 polyunsaturated fatty acid (n-3 PUFA) may have bone health promoting effects, very few human intervention studies have been conducted to date. The aim of this study was to examine whether plant (flaxseed oil, walnuts) and marine sources (microalgae oil) of n-3 PUFA in the context of low versus high n-6: n-3 ratio would influence markers of bone turnover. A randomized cross-over feeding trial (8-week periods) in 24 healthy adults was conducted. Subjects consumed eucaloric diets: Control (10:1 n-6:n-3 ratio), ALA diet (2:1 n-6:n-3 ratio; 8.4g/2400 kcal/d), EPA/DHA diet (0.20/0.72g EPA/DHA per 2400 kcal/d), and Combination diet (8.4g ALA plus 0.20/0.72g EPA/DHA). Under tightly controlled conditions, subjects were fed 3 of the 4 diets for 8 weeks each with a 4-6 week washout between diets. Serum markers of bone turnover [c-telopeptide (CTX), procollagen Type I N-terminal propeptide (PINP) and osteocalcin (OC)] and red blood cell membrane (RBC) fatty acids were analyzed at the end of each diet period. There were no significant changes in serum CTX, PINP and OC between the diets, but a there was a negative association between age and these bone markers. In conclusion, we did not observe changes in bone markers with either the plant or marine source of n-3 PUFA in the context of a high (10:1) or low (2:1) n-6: n-3 ratio among healthy adults.