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A diet high in meat protein and potential renal acid load increases fractional calcium absorption and urinary calcium excretion without affecting markers of bone resorption or formation in postmenopausal women.

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Our objective in this study was to determine the effects of a high-protein and high-potential renal acid load (PRAL) diet on calcium (Ca) absorption and retention and markers of bone metabolism. In a randomized crossover design, 16 postmenopausal women consumed 2 diets: 1 with low protein and low PRAL (LPLP; total protein: 61 g/d; PRAL: -48 mEq/d) and 1 with high protein and high PRAL (HPHP; total protein: 118 g/d; PRAL: 33 mEq/d) for 7 wk each separated by a 1-wk break. Ca absorption was measured by whole body scintillation counting of radio-labeled (⁴⁷)Ca. Compared with the LPLP diet, the HPHP diet increased participants' serum IGF-I concentrations ($P < 0.0001$), decreased serum intact PTH concentrations ($P < 0.001$), and increased fractional (⁴⁷)Ca absorption (mean \pm pooled SD: 22.3 vs. $26.5 \pm 5.4\%$; $P < 0.05$) and urinary Ca excretion (156 vs. 203 ± 63 mg/d; $P = 0.005$). The net difference between the amount of Ca absorbed and excreted in urine did not differ between 2 diet periods (55 vs. 28 ± 51 mg/d). The dietary treatments did not affect other markers of bone metabolism. In summary, a diet high in protein and PRAL increases the fractional absorption of dietary Ca, which partially compensates for increased urinary Ca, in postmenopausal women. The increased IGF-I and decreased PTH concentrations in serum, with no change in biomarkers of bone resorption or formation, indicate a high-protein diet has no adverse effects on bone health.