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Calcium balance and acid-base status of women as affected by increased protein intake and by sodium bicarbonate ingestion.

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Six women, aged 38 to 62 yr, participated in a 40-day metabolic study to investigate the effect of level of protein intake and of sodium bicarbonate ingestion on urinary calcium, net calcium balance, net renal acid excretion, and arterialized venous blood pH and bicarbonate ion concentration. The diet contained 44 g protein during the first 16 days and 102 g during the remaining 24 days. During the last 10 days of the study, 5.85 g of sodium bicarbonate was ingested concomitantly with the higher protein intake. Calcium, phosphorus, and magnesium intakes were held constant at 500, 900, and 300 mg, respectively. The increase in protein intake significantly increased urinary calcium and net renal acid excretion and the mean net calcium balance became negative. The ingestion of sodium bicarbonate alkalinized the urine and reversed the increase in urinary calcium associated with the higher protein intake; the mean net calcium balance became positive. The arterialized venous blood pH and bicarbonate ion concentrations were not significantly affected by dietary treatments. The results suggest that the ingestion of a small amount of sodium bicarbonate may be an effective way to increase calcium retention in women with protein-induced hypercalciuria.