

Br J Nutr. 2009 Nov;102(9):1341-7.

Acute effects of calcium carbonate, calcium citrate and potassium citrate on markers of calcium and bone metabolism in young women.

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Both K and Ca supplementation may have beneficial effects on bone through separate mechanisms. K in the form of citrate or bicarbonate affects bone by neutralising the acid load caused by a high protein intake or a low intake of alkalising foods, i.e. fruits and vegetables. Ca is known to decrease serum parathyroid hormone (S-PTH) concentration and bone resorption. We compared the effects of calcium carbonate, calcium citrate and potassium citrate on markers of Ca and bone metabolism in young women. Twelve healthy women aged 22-30 years were randomised into four controlled 24 h study sessions, each subject serving as her own control. At the beginning of each session, subjects received a single dose of calcium carbonate, calcium citrate, potassium citrate or a placebo in randomised order. The diet during each session was identical, containing 300 mg Ca. Both the calcium carbonate and calcium citrate supplement contained 1000 mg Ca; the potassium citrate supplement contained 2250 mg K. Markers of Ca and bone metabolism were followed. Potassium citrate decreased the bone resorption marker (N-terminal telopeptide of type I collagen) and increased Ca retention relative to the control session. Both Ca supplements decreased S-PTH concentration. Ca supplements also decreased bone resorption relative to the control session, but this was significant only for calcium carbonate. No differences in bone formation marker (bone-specific alkaline phosphatase) were seen among the study sessions. The results suggest that potassium citrate has a positive effect on the resorption marker despite low Ca intake. Both Ca supplements were absorbed well and decreased S-PTH efficiently.