

ORIGINAL RESEARCH COMMUNICATION

Calcium balance in 1–4-y-old children^{1, 2, 3, 4}

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Background: Few calcium balance data are available from young children on which to base dietary recommendations.

Objective: The objective of the study was to evaluate the relation between calcium intake and balance in healthy children aged 1–4 y consuming typical American diets.

Design: Subjects were assigned to a diet with nutrient intakes similar to those of their usual diet. Calcium absorption was assessed by using a dual-tracer stable-isotope technique. Endogenous fecal excretion was measured in a subset of children, and net calcium balance was calculated.

Results: Mean calcium intake was 551 mg/d (range: 124–983 mg/d), and mean (\pm SEM) calcium retention was 161 ± 17 mg/d. Both linear and nonlinear modeling of balance data showed that a calcium intake of ≈ 470 mg/d led to calcium retention of 140 mg/d, which is the amount that meets expected bone growth needs in children of this age. No evidence was found that calcium intakes of 800 to 900 mg/d reached the threshold intake beyond which no additional increase in calcium retention would occur.

Conclusions: Bone growth needs in 1–4-y-old children following American diets are met by a daily calcium intake of ≈ 470 mg/d, which suggests that the current Adequate Intake of 500 mg/d is close to the actual Estimated Average Requirement. The benefits and risks of higher calcium intakes consistent with threshold values should be evaluated in a controlled trial before those intakes could be used as a basis for dietary recommendations.

Key Words: Calcium absorption • stable isotopes • bioavailability • nutrient requirements

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