

Abstract

Am J Clin Nutr. 2008 Oct;88(4):877-85.

Dairy calcium supplementation in overweight or obese persons: its effect on markers of fat metabolism.

Bortolotti M, Rudelle S, Schneiter P, Vidal H, Loizon E, Tappy L, Acheson KJ.

Institute of Physiology, University of Lausanne, Lausanne, Switzerland.

BACKGROUND: Dairy calcium supplementation has been proposed to increase fat oxidation and to inhibit lipogenesis.

OBJECTIVE: We aimed to investigate the effects of calcium supplementation on markers of fat metabolism.

DESIGN: In a placebo-controlled, crossover experiment, 10 overweight or obese subjects who were low calcium consumers received 800 mg dairy Ca/d for 5 wk. After 4 wk, adipose tissue was taken for biopsy for analysis of gene expression. Respiratory exchange, glycerol turnover, and subcutaneous adipose tissue microdialysis were performed for 7 h after consumption of 400 mg Ca or placebo, and the ingestion of either randomized slow-release caffeine (SRC; 300 mg) or lactose (500 mg). One week later, the test was repeated with the SRC or lactose crossover.

RESULTS: Calcium supplementation increased urinary calcium excretion by 16% ($P = 0.017$) but did not alter plasma parathyroid hormone or osteocalcin concentrations. Resting energy expenditure (59.9 ± 3.0 or 59.6 ± 3.3 kcal/h), fat oxidation (58.4 ± 2.5 or 53.8 ± 2.2 mg/min), plasma free fatty acid concentrations (0.63 ± 0.02 or 0.62 ± 0.03 mmol/L), and glycerol turnover (3.63 ± 0.41 or 3.70 ± 0.38 micromol \cdot kg⁻¹ \cdot min⁻¹) were similar with or without calcium, respectively. SRC significantly increased free fatty acid concentrations, resting fat oxidation, and resting energy expenditure. During microdialysis, epinephrine increased dialysate glycerol concentrations by 250% without and 254% with calcium. Expression of 7 key metabolic genes in subcutaneous adipose tissue was not affected by calcium supplementation.

CONCLUSION: Dairy calcium supplementation in overweight subjects with habitually low calcium intakes failed to alter fat metabolism and energy expenditure under resting conditions and during acute stimulation by caffeine or epinephrine.

PMID: 18842771

