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The acute effects of calcium supplementation on appetite and satiety in overweight women

N. M. Al-Mana, S. A. Lanham-New and M. D. Robertson

Department of Nutrition and Metabolism, Faculty of Health and Medical Sciences, University of Surrey, Guildford, Surrey, GU2 7WG, UK

The prevalence of obesity has been widely reported in the past 20 years. In recent years, research has suggested that calcium (Ca) consumption could play an important role in the maintenance of a healthy body weight⁽¹⁾. Moreover, it has been reported that Ca deficiency may increase the risk of obesity to a greater extent than high fat diets or sedentary lifestyles⁽²⁾. It has been suggested that appetite and food intake may be affected by Ca intakes in the diet^(1,3,4); however, the mechanism is unclear.

The aim of the present study was to investigate the short-term effects of Ca on appetite and satiety in overweight/obese subjects and to investigate the effects of the Ca on glucagon-like peptide-1 (GLP-1) release.

Ten healthy female overweight/obese subjects (aged 18–45 years, BMI 25–37 kg/m²) participated in this single blind, randomized, crossover study. Subjects were required to consume a standard test breakfast, containing either 500 mg Ca (Calcium-Sandoz[®] Syrup) supplement or placebo (PL) mixed into orange juice. Subjects recorded ratings of hunger, satiety, fullness and prospective food consumption using visual analogue scales (VAS) every 30 min for 3 hours. Postprandial plasma glucose, insulin and GLP-1 concentrations were also measured. Energy intakes from an *ad libitum* lunch and over 24 hours were assessed.

The Ca significantly reduce hunger and in prospective food consumption ($p = 0.07$) and ($p = 0.012$) respectively as measured by the (VAS). In-line with this finding, the Ca-enriched breakfast also significantly reduced energy intake at the *ad libitum* lunch compared with PL (1006 (SEM 43.80) kcal versus 1122 (SEM 66.98) kcal, respectively, ($p = 0.017$). However, there were no significant effects of Ca over 24 hour compared to PL. Ca enrichment had no significant effect on plasma glucose concentrations compared with PL; whilst the postprandial insulin responses were significantly higher ($p = 0.007$). There were significantly lower GLP-1 levels with Ca ($p < 0.001$). These results suggest that calcium supplement may play an important role in reducing food intake in overweight/obese women. Further investigation in other groups would be required.

1. Zemel MB, et al. (2000) Regulation of adiposity by dietary calcium. *Faseb J* 14(9), 1132–1138.
2. Chaput JP, et al. (2009) Risk factors for adult overweight and obesity in the Quebec Family Study: have we been barking up the wrong tree? *Obesity (Silver Spring)* 17(10), 1964–1970.
3. Davies KM, et al. (2000) Calcium intake and body weight. *J Clin Endocrinol Metab* 85(12), 4635–4638.
4. Jacqmain M, et al. (2003) Calcium intake, body composition, and lipoprotein-lipid concentrations in adults. *Am J Clin Nutr* 77(6), 1448–1452.