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Role of calcium and vitamin D supplementation in dairy for the management of metabolic syndrome following an iso-caloric meal

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High dairy or calcium intake has been linked to the reduction of insulin resistance. However, the role of calcium in aspect of amount and source is not explored. Therefore, the present study was conducted to examine the effects of high and low levels of calcium dairy products as well as its sources, natural versus supplemented, on glucose homeostasis and appetite regulation. In a randomized, cross over design, twenty healthy male subjects (20-30 years) were provided two iso-caloric servings (250ml) of either; i) Boiled fresh milk (BFM; control), or ii) Low calcium milk (LCM; Nestle Milkpak; 250mg Ca), or iii) Low calcium simulated milk beverage (LCS; 250mg Calcium carbonate), or iv) High calcium simulated milk beverage (HCS; 500mg calcium carbonate). Following dairy product intake, the subjects were served an ad libitum pizza meal at 120min to assess the food intake. After that, blood glucose (BG),

average subjective appetite (ASA), serum insulin and satiety related hormones were measured at different time intervals. The BG concentration was reduced ($P < 0.0001$) in control and HCS groups compared with LCS group, without disproportionately increase in insulin. In addition natural source of calcium (control), higher calcium levels were observed to reduce BG levels compared with its lower counterpart ($P = 0.0002$). However, post-treatment average subjective appetite ($P = 0.0017$) and food intake ($P = 0.0021$) were significantly reduced due to amount of calcium, but not source of calcium. HCS further significantly improved GLP-1 concentration ($P < 0.0001$). Both amount and source of calcium regulate glycemic responses, while satiety responses were mainly affected by the amount of calcium but not from its source.

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