

ORIGINAL RESEARCH COMMUNICATION

Skim milk compared with a fruit drink acutely reduces appetite and energy intake in overweight men and women^{1,2,3}

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Background: Several studies show that proteins, including whey and casein, are more satiating than carbohydrates. It follows that skim milk would be more satiating than sugar-rich beverages. However, this has yet to be shown.

Objective: The objective was to investigate the effects of drinking skim milk in comparison with a fruit drink at breakfast on self-reported postmeal satiety and energy intake at lunch.

Design: In a randomized crossover trial, 34 overweight women ($n = 21$) and men ($n = 13$) attended 2 sessions 1 wk apart. At each session, participants consumed a fixed-energy breakfast together with either 600 mL skim milk (25 g protein, 36 g lactose, <1 g fat; 1062 kJ) or 600 mL fruit drink (<1 g protein, 63 g sugar, <1 g fat; \approx 1062 kJ). Participants provided satiety ratings throughout the morning. Four hours after breakfast they consumed an ad libitum lunch, and energy intake was assessed.

Results: Participants consumed significantly less energy at lunch after consuming skim milk (mean: 2432 kJ; 95% CI: 2160, 2704 kJ) than after consuming the fruit drink (mean: 2658 kJ; 95% CI: 2386, 2930 kJ), with a mean difference of \approx 8.5% ($P < 0.05$). In addition, self-reports of satiety were higher throughout the morning after consumption of skim

milk than after consumption of the fruit drink ($P < 0.05$) with the differences becoming larger over the 4 h ($P < 0.05$).

Conclusion: Consumption of skim milk, in comparison with a fruit drink, leads to increased perceptions of satiety and to decreased energy intake at a subsequent meal. This trial was registered with the Australian New Zealand Clinical Trials Registry at www.anzctr.org.au as ACTRN12608000510347.