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## Influence of the constancy of daily meal pattern on postprandial energy expenditure in healthy weight women

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Meal pattern might have an impact on metabolism and therefore impacts on health. However, studies which have evaluated the effects of an irregular meal pattern on energy metabolism, in adults, are few. Several experimental studies<sup>(1,2)</sup>, have shown that erratic eating (different numbers of meal on each day) is associated with potentially deleterious alterations in lipid and carbohydrate metabolism. Postprandial energy expenditure may also vary and might lead to weight gain and the development of obesity. The present study investigated the effect of irregular meal frequency on postprandial energy expenditure and anthropometric measurements in healthy women.

11 healthy weight women (18–40 years) were studied in a randomised crossover trial with two phases of 2 weeks each. In Phase 1, participants consumed either a regular meal pattern (6meals/day) or an irregular meal pattern (varying from 3 to 9meals/day). In Phase 2, participants followed the alternative meal pattern to that followed in Phase 1, after a 2-weeks washout period. In the two phases, identical foods were provided to a participant in amounts designed to keep body weight constant. Participants came to the laboratory after an overnight fast at the start and end of each phase. Resting metabolic rate (RMR) was measured by indirect calorimetry, in the overnight fasted state and during the 3 h period after consumption of a milkshake, test drink.

There were no significant changes in body weight and anthropometric measurements after both meal pattern interventions. There was also no significant difference in mean daily energy intake between the regular and irregular meal pattern ( $2043 \pm 31$  and  $2099 \pm 33$  kcal/d respectively). Fasting RMR showed no significant differences cross the experiment visits. However, there was a significant difference in total postprandial energy expenditure (measured for 3 h) by visit ( $P = 0.04$ ). Postprandial energy expenditure after the regular meal pattern was significantly higher than at baseline ( $25.8 \pm 6.8$  and  $17.5 \pm 8.9$  kcal respectively;  $P = 0.002$ ) or than after the irregular meal pattern ( $14.8 \pm 11.7$  kcal;  $P = 0.04$ ).

Eating regularly for a 14-day period significantly increases postprandial energy expenditure which may contribute to weight loss and obesity management, but further studies are needed in obese participants.

1. Farshchi HR, Taylor MA & Macdonald IA. (2004) *Int J Obes* **28**, 653–660.
2. Farshchi HR, Taylor MA & Macdonald IA. (2005) *Am J Clin Nutr* **81**, 16–24.