Egg Nutrition Center

ENC

Protein Research

Batterham M, Cavanagh R, Jenkins A, Tapsell L, Plasqui G, Clifton P. High protein meals may benefit fat oxidation and energy expenditure in individuals with higher body fat. *Nutrition & Dietetics* 2008;65:246-52.

AIM: Fat oxidation is impaired in obesity. The aim of this study was to determine if fat oxidation, seen in a high protein meal response, was influenced by body composition.

METHODS: Subjects were provided with control (14% protein, glycemic index, GI 65), high protein high GI (33% protein, GI 74), and high protein low GI (35% protein, GI 45) meals. Substrate oxidation and energy expenditure were measured in room calorimeters over 8 hours in 18 subjects. Results were compared using a repeated measures ANOVA with a customized post-hoc analysis (to compare the protein diets averaged versus control and to compare the low and high GI diets) and covariates in a linear model of the form; $y=\alpha + \beta1*$fat free mass (kg)$+\beta2*$loge fat mass (kg).

RESULTS: The full model found significant meal effects on fat oxidation (0.21±0.21kcal.min1 high protein high GI, 0.34±0.11kcal.min1 high protein low GI, 0.55±0.2kcal.min1 control, F=3.50, P=0.007). The effect on energy expenditure (1.67±0.07kcal.min1 high protein high GI, 1.61±0.08kcal.min1 high protein low GI, 1.67±0.08kcal.min1 control) approached significance (F=2.45, P=0.070). Post-hoc analysis revealed a protein effect (P=0.004 for fat oxidation and P=0.030 for energy expenditure). Significant interactions indicated meal response was influenced by body composition. The high protein meals eliminated the negative relationship between body fat and fat oxidation ($\alpha= -4.7$, $\beta2=2.23$, $P<0.01$) and between body fat and energy expenditure which were evident in the control meal ($\alpha= -1.5$, $\beta2=0.63$, $P<0.05$). No effect of GI was evident.

CONCLUSION: High protein intakes may ameliorate an obesity induced decline in fat oxidation.