



Embargoed until 00.01am, Tuesday 5th June 2007

Exercise after meals may aid weight loss

Main messages:

- 1. New research has found that exercise after meals may be effective in promoting weight loss**
- 2. This is because exercise causes a short-term increase in the levels of hormones that reduce appetite**

Exercise after meals may help you lose weight. Research in this month's *Journal of Endocrinology* shows that exercise after meals reduces appetite in the short-term by increasing the level of hormones that tell our brain when our stomach is full. When the energy sweated off through exercise is taken into account, at the next mealtime people who have exercised consume less calories overall than people who haven't.

Researchers at the University of Surrey and Imperial College London, led by Dr Denise Robertson, studied how exercise after a meal affects hunger levels, the amount of food eaten at the next meal and the level of hormones produced by the gut. These 'hunger' hormones, called PYY, GLP-1 and PP tell your brain when your stomach is full. Twelve volunteers were fed a standardised breakfast. Half of them then exercised for an hour while the other half sat quietly. Both groups were left for another hour and then allowed to eat as much as they liked.

Levels of 'hunger' hormones increased during and immediately after exercise with volunteers also reporting feeling less hungry during this time. Unsurprisingly, people who exercised burned more calories (492 kcal) than those who sat quietly (197 kcal). When given the chance to eat afterwards, people who had exercised ate more (913 kcal) than people who hadn't (762 kcal). However, when the amount of energy burned during exercise was taken into account, people who had exercised took in less calories overall than people who didn't (421 kcal for exercise group vs. 565 kcal for non-exercise group).

Approximately 60% of people in the UK are now overweight. A major cause of this is suspected to be the huge decrease in our physical activity over the last 20 years. Obesity is linked to many health problems including heart disease, stroke, diabetes and cancer and is responsible for 9000 premature deaths each year in England alone. This study provides further evidence that exercise may aid weight loss and weight maintenance as part of a healthy balanced lifestyle.

Researcher Dr Denise Robertson said:

“In the past we have been concerned that, although exercise burns energy, people subsequently ate more after working out. This would cancel out any possible weight reduction effects of exercise. Our research found that moderate exercise after a meal may decrease hunger during the exercise itself by increasing the amount of hormones that tell the brain our stomach is full. At the next mealtime, when the amount of energy burned through exercise is taken into account, people who had exercised consume fewer calories than those who hadn’t. This is an initial study where we only examined a small number of people. We now need to carry out a larger study to confirm this effect, and the mechanisms of how it occurs.

Obesity is one of the major health problems facing people in the UK today. It can lead to many serious medical conditions such as diabetes and heart disease. Our research shows that exercise may alter people’s appetite to help them lose weight and prevent further weight gain as part of a healthy, balanced lifestyle.”

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Notes for editors:

This paper appears in the May edition of the *Journal of Endocrinology*, 193, 251-258. The *Journal of Endocrinology* is the official journal of the Society for Endocrinology.

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ABSTRACT

Effects of exercise on gut peptides, energy intake and appetite

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This study investigated the acute effects of exercise on the postprandial levels of appetite-related hormones and metabolites, energy intake (EI) and subjective measures of appetite. Ghrelin, polypeptide YY (PYY), glucagon-like peptide-1 (GLP-1) and pancreatic polypeptide (PP) were measured in the fasting state and postprandially in 12 healthy, normal weight volunteers (six males and six females) using a randomised crossover design. One hour after a standardized breakfast, subjects either cycled for 60 min at 65% of their maximal heart rate or rested. Subjective appetite was assessed throughout the study using visual analogue scales and subsequent EI at a buffet meal was measured at the end (3-h post-breakfast and 1-h post-exercise). Exercise significantly increased mean PYY, GLP-1 and PP levels, and this effect was maintained during the post-exercise period for GLP-1 and PP. No significant effect of exercise was observed on postprandial levels of ghrelin. During the exercise period, hunger scores were significantly decreased; however, this effect disappeared in the post-exercise period. Exercise significantly increased subsequent absolute EI, but produced a significant decrease in relative EI after accounting for the energy expended during exercise. Hunger scores and PYY, GLP-1 and PP levels showed an inverse temporal pattern during the 1-h exercise/control intervention. In conclusion, acute exercise, of moderate intensity, temporarily decreased hunger sensations and was able to produce a short-term negative energy balance. This impact on appetite and subsequent energy homeostasis was not explained by changes in postprandial levels of ghrelin; however, 'exercise-induced anorexia' may potentially be linked to increased PYY, GLP-1 and PP levels.