

# The influence of macronutrient composition of meals consumed the day before and the day including morning exercise session on gastrointestinal appetite hormones and post-meal insulin sensitivity in overweight men

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Exercise should be a useful strategy aimed at body fat reduction. However, the occurrence of compensatory eating may compromise the ability to achieve expected body weight loss<sup>(1)</sup>. Exercise-induced compensatory eating may be caused by the post-exercise changes of episodic appetite hormones<sup>(2)</sup>, which are also known to be affected by the macronutrient composition of meals<sup>(3)</sup>. The aim of this study is to compare the effect of consuming high-carbohydrate, low-fat (HCLF) and high-fat, low-carbohydrate (HFLC) meals before and after acute morning exercise on gastrointestinal appetite hormones energy intake and post-meal insulin sensitivity.

Fourteen sedentary healthy overweight males (age:  $29 \pm 3.63$  years, BMI:  $28.58 \pm 3.53$  kg/m<sup>2</sup>) in a cross-over manner completed two 7 hr trials (HCLF and HFLC). On the day before each trial, participants consumed either HCLF or HFLC dinner. In the morning of the experimental trial participants arrived at the laboratory in the fasted state. They walked on a treadmill for one hour at an intensity corresponding to 55% VO<sub>2</sub> max, then rested for one hour before consumption of either HCLF or HFLC breakfast. Participants rested for another 5 hours and then consumed an ad libitum buffet meal. Plasma samples were collected in the fasted state and every 30 minutes of the 7-hour experimental trial.

The main findings were that during 7-hour experimental trial, a significantly greater response of GLP-1 was found during the HFLC trial compared to the HCLF trial. (Two-way Anova,  $P < 0.001$  for trial and time effect) In response to the PYY n and total ghrelin concentrations, there was a significant difference between the two trials.

Response of insulin concentration was higher during the HCLF trial compared to the HFLC trial (Two-way Anova,  $P < 0.001$  for trial and time effect) while glucose concentration was not different between trials. Post-meal insulin sensitivity index (ISI) was higher in the HFLC than HCLF trial ( $P < 0.001$ , t-test).

In conclusion, consumption of HFLC meals around exercise sessions might be expected to have a favourable effect on appetite regulation and post-meal insulin sensitivity. Further studies are required to investigate the long-term effects of diets with different macronutrient compositions applied in combination with exercise training on subjective appetite, other appetite-regulating hormones, energy intake, and body mass and body fat changes.

## References

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