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Impaired ghrelin response after high-fat meals is associated with decreased satiety in obese and lean Chinese young adults.

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Ghrelin and peptide tyrosine tyrosine (PYY) are known to affect appetite and body weight, but the acute effects of fat-rich and carbohydrate-rich meals on plasma ghrelin, PYY response, and appetite remain unclear. We hypothesized that obese individuals had impaired postprandial ghrelin and PYY response based on macronutrient content of meals, affecting appetite and energy intake. We conducted a randomized crossover trial comparing fasting ghrelin and PYY concentrations, postprandial ghrelin and PYY responses, and subjective appetite in 15 obese and 12 lean Chinese young adults after they consumed isocaloric high-carbohydrate [HC; 88% energy carbohydrate, 4% energy fat, 8% energy protein] and high-fat (HF; 25% energy carbohydrate, 71% energy fat, 4% energy protein) meals. Ghrelin concentrations over time differed between HC and HF meals ($P < 0.01$) via repeated measures of ANOVA, with lower postprandial ghrelin suppression after HF meals, especially among obese participants. PYY response differed between meals among lean participants, with a delayed and higher postprandial PYY peak after the HF meal ($P < 0.01$); however, PYY response did not differ among obese participants. The incremental area under the curve of PYY was higher in lean than in obese participants after the HF meal ($P < 0.01$). These results suggest that impaired ghrelin response after HF meals may contribute to reduced satiety and overeating, especially among obese individuals. Whether an attenuated response of PYY in obese participants after a HF meal bears any physiological consequences warrants further study.

PMID: 19458028 [PubMed - indexed for MEDLINE]

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