Format: Abstract

Am J Physiol. 1985 Nov;249(5 Pt 1):E470-7.

Short-term, mixed-diet overfeeding in man: no evidence for "luxuskonsumption".

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Abstract

After 13 days of weight maintenance diet (13,720 +/- 620 kJ/day, 40% fat, 15% protein, and 45% carbohydrate), five young men (71.3 +/- 7.1 kg, 181 +/- 8 cm; means +/- SD) were overfed for 9 days at 1.6 times their maintenance requirements (i.e., +8,010 kJ/day). Twenty-four-hour energy expenditure (24-h EE) and basal metabolic rate (BMR) were measured on three occasions, once after 10 days on the weight-maintenance diet and after 2 and 9 days of overfeeding. Physical activity was monitored throughout the study, body composition was measured by underwater weighing, and nitrogen balance was assessed for 3 days during the two experimental periods. Overfeeding caused an increase in body weight averaging 3.2 kg of which 56% was fat as measured by underwater weighing. After 9 days of overfeeding, BMR increased by 622 kJ/day, which could explain one-third of the increase in 24-h EE (2,038 kJ/day); the remainder was due to the thermic effect of food (which increased in proportion with excess energy intake) and the increased cost of physical activity, related to body weight gain. This study shows that approximately one-quarter of the excess energy intake was dissipated through an increase in EE, with 75% being stored in the body. Under our experimental conditions of mixed overfeeding in which body composition measurements were combined with those of energy balance, it was possible to account for all of the energy ingested in excess of maintenance requirements.

PMID: 4061637 DOI: 10.1152/ajpendo.1985.249.5.E470

[Indexed for MEDLINE]