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Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient Randomised Controlled Trial of Ad Libitum Food Intake

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Abstract

We investigated whether ultra-processed foods affect energy intake in 20 weight-stable adults, aged (mean \pm SE) 31.2 ± 1.6 years and BMI = 27 ± 1.5 kg/m². Subjects were admitted to the National Institutes of Health (NIH) Clinical Center and randomised to receive either ultra-processed or unprocessed diets for two weeks, immediately followed by the alternate diet for two weeks. Meals were designed to be matched for presented calories, energy density, macronutrients, sugar, sodium, and fibre. Subjects were instructed to consume as much or as little as desired. Energy intake was greater during the ultra-processed diet (508 ± 106 kcal/day; $p = 0.0001$), with increased consumption of carbohydrate (280 ± 54 kcal/day; $p < 0.0001$) and fat (230 ± 53 kcal/day; $p = 0.0004$), but not protein (-2 ± 12 kcal/day; $p = 0.85$). Weight changes were highly correlated with energy intake ($r = 0.8$, $p < 0.0001$), with participants gaining 0.9 ± 0.3 kg ($p = 0.009$) during the ultra-processed diet and losing 0.9 ± 0.3 kg ($p = 0.007$) during the unprocessed diet. The restriction of consumption of ultra-processed foods may be an effective strategy for obesity prevention and treatment.