

# Study shows people 'right size' portions of high-calorie foods

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New research has revealed that humans moderate the size of energy-rich meals they eat, suggesting people are smarter eaters than previously thought.

The findings, led by the University of Bristol, revisit the long-held belief that humans are insensitive to the energy content of the foods they consume and are therefore prone to eating the same amount of [food](#) (in weight) regardless of whether it is energy-rich or energy-poor.

The study, published today in *The American Journal of Clinical Nutrition*, is especially significant as it challenges a common view among researchers that people are apt to overconsume high-energy foods.

This idea stems from previous studies which manipulated the energy content of foods or meals to create low- and high-energy versions. In those studies, people were not told whether they were eating a low- or a high-energy version, and findings showed they tended to eat meals of the same weight, resulting in greater calorie intake with the high-energy version.

"For years we've believed that humans mindlessly overeat energy-rich meals. Remarkably, this study indicates a degree of nutritional intelligence whereby humans manage to adjust the amount they consume of high-energy density options," said lead author Annika Flynn, Doctoral Researcher in Nutrition and Behavior at the University of Bristol.

Rather than artificially manipulating the calories in single foods, this study looked at data from a [trial](#) using a normal, everyday meals with different energy densities, such as a chicken salad sandwich with fig roll biscuits or porridge with blueberries and almonds. The trial involved 20 [healthy adults](#) who temporarily lived in a hospital ward where they were served a variety of meals for four weeks.

The team of international researchers, including leading experts in diet and metabolism from the National Institutes of Health (NIH) in the United States, calculated the calories, grams, and energy density (calories per gram) for every meal each participant consumed. The results

demonstrated that meal calorie intake increased with energy density in energy-poor meals as previous observations with artificially manipulated foods also found. However, surprisingly, with greater energy density a turning point was observed whereby people start to respond to increases in calories by reducing the size of the meals they consume. This suggests a previously unrecognized sensitivity to the energy content of the meals people were eating.

As this finding was based on data from a small, highly-controlled trial, the researchers went on to see if this pattern remained when participants lived freely, choosing their own meals. Using data from the UK National Diet and Nutrition Survey, researchers again found meal calorie intake increased with [energy density](#) in meals which were energy-poor and then decreased in energy-rich meals. Importantly, for this turning point pattern to occur, participants would have needed to consume smaller meals, by weight, of the more energy-rich meals.

Annika said: "For instance, people ate smaller portions of a creamy cheese pasta dish, which is an energy-rich meal, than a salad with lots of different vegetables which is relatively energy-poor."

This research sheds new light on human eating behavior, specifically an apparent subtle sensitivity to calories in energy-rich [meals](#).

Co-author Jeff Brunstrom, Professor of Experimental Psychology, said: "This research gives added weight to the idea humans aren't passive overeaters after all, but show the discerning ability to moderate how much of an energy-rich meal they consume.

"This work is particularly exciting as it reveals a hidden complexity to how humans interact with modern [energy](#)-rich foods, something we've been referring to as '[nutritional intelligence](#)'. What this tells us is we don't seem to passively overconsume these foods and so the reason why

they are associated with obesity is more nuanced than previously thought. For now, at least this offers a new perspective on a longstanding issue and it opens the door to a range of important new questions and avenues for future research."

**More information:** Annika N Flynn et al, Time to revisit the passive overconsumption hypothesis? Humans show sensitivity to calories in energy-rich meals, *The American Journal of Clinical Nutrition* (2022). [DOI: 10.1093/ajcn/nqac112](https://doi.org/10.1093/ajcn/nqac112)

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