

We're using less energy when we rest than we did 30 years ago, study reveals

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A new study published April 26 in *Nature Metabolism* and led by scientists from the University of Aberdeen has shown that the amount of energy we expend while resting has declined. A Research Briefing on

their work was published in the same journal issue.

Obesity is a major health issue, particularly in the West, caused by an imbalance between the energy we consume and the amount we expend.

There has been lots of debate about whether the primary contributor to increasing obesity levels is because we have increased our [food consumption](#) or reduced our expenditure.

Professor John Speakman, who led an international team of scientists carrying out the research, said, "Studies of food supply suggest we are consuming more food, but working out exactly how much is difficult because people are not very good at reporting what they eat, and we can look at supply figures, but then it is a problem quantifying food waste. We have some evidence that people are becoming more sedentary, especially with a shift from manual to more sedentary occupations—but that is also only an indirect measure of how much energy people are spending.

"There is however a method for directly measuring our [energy expenditure](#) called the doubly-labeled water technique, which is a [urine test](#) that involves having a person drink water in which the hydrogen and oxygen in the [water molecules](#) have been replaced with naturally occurring 'heavy' forms, and then measuring how quickly they're flushed out."

The team created a database of measures using this method which involved data from more than 100 studies and more than 6,000 measurements.

Using this database, hosted by the International Atomic Energy Agency, the team were able to analyze more than 4000 measurements of adults living in Europe and the U.S. It showed that once the data was adjusted

for effects of age and body composition that total energy expenditure has declined since the early 1990s—by about 7.7% in males and 5.4% in females.

Professor Speakman said, "We expected there might be a decline, but the reason for the decline may come as a surprise.

"By combining the database measurements of total energy demands with measures of resting energy demands it was possible to establish the contribution to this decline by changes in resting and activity expenditure.

"The results showed that in fact activity expenditure has slightly increased and that the decline is all down to a reduction in the energy we spend when we are at rest."

Why resting expenditure has fallen, however, remains a mystery.

"One potential contributing factor is changes in our diet. We were able to see in mice that the make-up of the fat they ate affected their metabolism, but whether the same effects occur in humans requires verification.

"This is potentially a very exciting piece of research as if the same effects do occur in humans, it raises the possibility that we may be able to reverse this decline by changing what we eat."

More information: John R. Speakman et al, Total daily energy expenditure has declined over the past three decades due to declining basal expenditure, not reduced activity expenditure, *Nature Metabolism* (2023). [DOI: 10.1038/s42255-023-00782-2](https://doi.org/10.1038/s42255-023-00782-2)

Human basal metabolic rate has declined over the past 30 years, *Nature*

Metabolism (2023). [DOI: 10.1038/s42255-023-00790-2](https://doi.org/10.1038/s42255-023-00790-2)

Provided by University of Aberdeen

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