

Age and sex found to influence health benefits of dieting

April 25 2023



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Researchers have found that males on reduced calorie diets showed greater fat loss and improvements in blood sugar levels compared with females.

The findings suggest that estrogen, one of the main female sex hormones, may play a role in determining the [health benefits](#) of dieting. Experts say this could help to identify those most likely to benefit from a restricted calorie diet. The study is published in the journal *eLife*.

Health benefits

Reducing [calorie intake](#) while maintaining levels of essential nutrients is linked to the prevention of conditions such as obesity, [high blood pressure](#) and type 2 diabetes, and increased life expectancy.

The University of Edinburgh-led research team looked at the impact of a reduced calorie diet on the health of both mice and humans.

The six-week study involved 96 mice whose daily calorie consumption was 30% less than normal and 85 mice on a normal diet.

The team found that the reduced calorie [diet](#) lowered blood sugar by 22% in [young males](#) but only 16% in young females.

Fat loss

The effects on body fat were even more striking—males decreased fat mass by nearly 70% but females lost no fat at all.

The study found young female mice resisted [fat loss](#) because, compared to males, they limited the breakdown of body fat, used less energy and had increased fat production after meals.

By contrast, when dieting began at older ages, there was no significant difference in fat loss between sexes. Female mice lost around half of their body fat—a similar level to males.

Human study

A small [human](#) weight loss study of 42 overweight or obese men and women confirmed the same age- and sex-based differences also occur in humans.

Across four weeks, men under 45-years-old lost more than 16% of their body fat, while women in the same age group lost only 8%, half as much as the men.

There was no difference in fat loss between males and females older than 45, with both sexes losing around 10% of their [body fat](#).

The human study was not originally designed to test the influence of age and sex on dieting but the researchers were able to analyze the data retrospectively to address this. A larger human study investigating the impact of age and sex is needed to confirm these findings, experts say.

"Reduced-calorie diets have many health benefits and may promote healthy aging. Some previous research suggested that the effectiveness of these diets may differ between males and females, but our study is the first to show that these sex differences largely disappear when dieting begins at older ages. This could help us to devise improved nutritional strategies to prevent diseases and promote healthy aging," says Dr. William Cawthorn, Senior Lecturer (Associate Professor) at the University of Edinburgh BHF Center for Cardiovascular Science and study lead.

More information: Karla J Suchacki et al, The effects of caloric restriction on adipose tissue and metabolic health are sex- and age-dependent, *eLife* (2023). [DOI: 10.7554/eLife.88080](https://doi.org/10.7554/eLife.88080)

Provided by University of Edinburgh

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