

# Longer daily fasting times improve health and longevity in mice

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Increasing time between meals made male mice healthier overall and live longer compared to mice who ate more frequently, according to a new study published in the Sept. 6, 2018 issue of *Cell Metabolism*. Scientists from the National Institute on Aging (NIA) at the National Institutes of Health, the University of Wisconsin-Madison, and the Pennington Biomedical Research Center, Baton Rouge, Louisiana, reported that health and longevity improved with increased fasting time, regardless of what the mice ate or how many calories they consumed.

"This study showed that [mice](#) who ate one meal per day, and thus had the longest fasting period, seemed to have a longer lifespan and better outcomes for common age-related liver disease and metabolic disorders," said NIA Director Richard J. Hodes, M.D. "These intriguing results in an animal model show that the interplay of total caloric intake and the length of feeding and fasting periods deserves a closer look."

The scientists randomly divided 292 male mice into two diet groups. One [group](#) received a naturally

sourced diet that was lower in purified sugars and fat, and higher in protein and fiber than the other diet. The mice in each diet group were then divided into three sub-groups based on how often they had access to food. The first group of mice had access to food around the clock. A second group of mice was fed 30 percent less calories per day than the first group. The third group was meal fed, getting a single meal that added up to the exact number of calories as the round-the-clock group. Both the meal-fed and calorie-restricted mice learned to eat quickly when food was available, resulting in longer daily fasting periods for both groups.

The scientists tracked the mice's metabolic health through their lifespans until their natural deaths and examined them post-mortem. Meal-fed and calorie-restricted mice showed improvements in overall health, as evidenced by delays in common age-related damage to the liver and other organs, and extended longevity. The calorie-restricted mice also showed significant improvement in fasting glucose and insulin levels compared to the other groups. Interestingly, the researchers found that diet composition had no significant impact on lifespan in the meal fed and calorie restricted groups.

According to the study's lead author, Rafael de Cabo, Ph.D., chief of the Translational Gerontology Branch of the NIA Intramural Research Program, scientists have studied the beneficial effects of caloric restriction for more than a century, but the impact of increased fasting times has recently come under closer scrutiny.

"Increasing daily fasting times, without a reduction of calories and regardless of the type of [diet](#) consumed, resulted in overall improvements in health and survival in male mice," said de Cabo. "Perhaps this extended daily [fasting](#) period enables repair and maintenance mechanisms that would be absent in a continuous exposure to food."

The researchers say their findings are encouraging

for future studies on how these types of time-restricted eating patterns might help humans to maintain healthy weight and reduce some common age-related metabolic disorders. According to de Cabo, next steps for this research include expanding these findings to other strains of mice and other lab animal species using both sexes, and to find the potential translation of the findings in humans.

Provided by National Institutes of Health

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