

Never Too Old?

Calorie-slashing diet might lengthen lives of even graying animals

Mitch Leslie

The elderly have to endure plenty of indignities, from balky joints and dimming vision to offspring impatient for their inheritance. Making matters worse, older animals might not benefit from a low-cal diet that extends the lives of younger ones. New work challenges that view, suggesting that slashing food consumption even fairly late in life can add time, although skeptics remain unconvinced.

Chopping food intake by 20% to 40%, a regimen known as calorie restriction, can stretch life span. The diet also seems to tune up animals' metabolisms, lowering concentrations of blood insulin and glucose, for example. Whether calorie restriction works in humans remains uncertain. Researchers also aren't sure whether beginning the regimen at fairly late ages still buys the benefits. Last fall, evolutionary biologist Linda Partridge of University College London, U.K., and colleagues discovered that fruit flies gained the same amount of time whether they started dieting early or late in life (see "[Second Chance](#)"). But biogerontologist Michael Forster of the University of North Texas Health Science Center in Fort Worth and biochemist Rajindar Sohal of the University of Southern California in Los Angeles found evidence that calorie restriction harms aged mice. Cutting the animals' rations provoked some physiological improvements, but their death rate spiked. However, molecular biologist Joseph Dhahbi of BioMarker Pharmaceuticals in Campbell, California, and colleagues fault the methods. The animals weren't prepared for the abrupt shift to low-cal fare, Dhahbi says, and they starved to death.

To avoid that problem, Dhahbi and colleagues eased 19-month-old mice--which he says are equivalent to 60- or 65-year-old humans--onto the spartan diet. During the study's first year, the death rate among the hungry mice sank to less than one-third that of the control group. Dieting mice also showed lower rates of cancer, and calorie restriction extended the average remaining life span by about 42%. But after about a year, during which approximately half the rodents perished, the mortality and cancer rates for the two groups became equal. Overall, the late shift to lean rations boosted average life span about 15%--versus the 40% that is typical for lifelong calorie restriction. Dhahbi says that these results suggest that calorie restriction slows aging and hinders growth of tumors, the leading cause of death in this mouse strain. Using microarrays, the researchers showed that beginning calorie restriction late in life produced many of the same gene-activity changes as did beginning it right after weaning. The experiments suggest that "calorie restriction started even at old age will give beneficial effects," Dhahbi says.

The findings supply more evidence that "there isn't a set window of opportunity" for reaping the benefits of calorie restriction, says gerontologist Brian Merry of the University of Liverpool in the U.K. But "the longer you wait, the smaller the effect." Forster and Sohal say that the results don't challenge their conclusion that calorie restriction could endanger the aged. The mice that Dhahbi's group used were not that old, Forster says. In human terms, they were about 45 to 50 at the experiment's inception, not 60 to 65. Researchers need to do more work before we'll know whether eating less will give old folks more time to spend their children's inheritance.

References

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