

Older people who diet without exercising lose valuable muscle mass

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A group of sedentary and overweight older people placed on a four-month exercise program not only became more fit, but burned off more fat, compared to older sedentary people who were placed on a diet but did not exercise.

The new study also showed that when older people diet without exercising, they lose more lean muscle compared to those who exercise, said senior researcher Bret H. Goodpaster. When they combined weight loss with exercise, it nearly completely prevented the loss of lean muscle mass. The results are important because older people tend to lose muscle mass as they age and too much muscle loss may interfere with activities of daily living.

The study, "Separate and combined effects of exercise training and weight loss on exercise efficiency and substrate oxidation," appears in the current issue of the *Journal of Applied Physiology*, published by The American Physiological Society. Francesca Amati, John J. Dube, Chris Shay and Goodpaster, all of the University of Pittsburgh, carried out the study.

Study looks at exercise efficiency

The researchers wanted to know the best way to get better (more efficient) at completing a defined exercise task. In particular, they wanted to know if greater fitness could be achieved through exercise

training, weight loss (through dieting), or both. In addition, they wanted to know which fuel source the body would draw upon, carbohydrates or fats, under these different conditions.

The 64 participants were 60-75 years of age and were either overweight or obese. All of the participants were sedentary at the outset of the study. The researchers divided the participants into three groups:

- exercise only
- diet only
- exercise plus diet

Those who exercised could either walk on a treadmill or ride a stationary bicycle, although most chose to walk. The dieters reduced their caloric intake to achieve a 10% weight loss by the end of the four-month study period. The final group combined both the daily exercise and the diet.

Exercise increases efficiency, burns more fat

The researchers measured how many calories the participants expended during a set work load on a stationary bicycle at the beginning and at the end of the experiment. They found that the:

- Exercise group expended fewer calories (became more efficient) on the exercise task at the end of the study compared to the beginning.
- Exercise group drew more on fat stores as the source of their body's fuel.
- Diet-only group did not gain efficiency in performing the exercise task, even though they weighed less at the end of the experiment.
- Diet-only group's weight loss resulted from a loss of both muscle and fat.
- Exercise plus diet group was the most efficient at the exercise task at the end of the experiment. This shows an additive effect of both dieting

and exercise, but most of that benefit was due to exercise.

-- Exercise plus diet group, like the exercise-only group, drew more on fat stores as an energy source.

"The take-home message is that, even among older people and during a fairly short period of time, exercise produces metabolic changes that require the expenditure of fewer calories during physical activity," Goodpaster said. Exercise also allowed older people to more preferentially burn fat, which may be healthier metabolically."

Source: American Physiological Society

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