

'Biggest Loser' study finds modest diet and exercise can sustain weight loss

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Exercise and healthy eating reduce body fat and preserve muscle in adults better than diet alone, according to a study funded and conducted by National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), part of the National Institutes of Health. The study was recently published online in *Obesity* and will be in a future print edition.

NIDDK senior investigator Kevin Hall, Ph.D., analyzed the individual effects of daily [strenuous exercise](#) and a restricted diet by examining data from 11 participants from the reality television program "The Biggest Loser." The program shows [obese adults](#) losing large amounts of weight over several months. Participants were initially isolated on a ranch followed by an extended period at home.

"By including the show's contestants as voluntary [study participants](#), this research took advantage of a cost-efficient opportunity to study a small group of [obese individuals](#) already engaged in an intensive [lifestyle intervention](#)," said Hall, who has no [financial ties](#) and no other affiliation to the show.

Researchers measured body fat, total [energy expenditure](#) and resting metabolic rate—the energy burned during inactivity—three times: at the start of the program, at week 6, and at week 30, which was at least 17 weeks after participants returned home. Participation in the program led to an average weight loss of 128 pounds, with about 82 percent of that coming from body fat, and the rest from lean tissue like muscle. Preserving lean tissue, even during rapid and substantial weight loss,

helps maintain strength and mobility and reduces risk of injury, among other benefits.

Hall used a mathematical computer model of [human metabolism](#)—currently intended for research conducted by scientists and health professionals—to calculate the diet and exercise changes underlying the observed body weight loss. Because the TV program was not designed to directly address how the exercise and diet interventions each contributed to the weight loss, the computer model simulated the results of diet alone and exercise alone to estimate their relative contributions.

At the competition's end, diet alone was calculated to be responsible for more weight loss than exercise, with 65 percent of the weight loss consisting of body fat and 35 percent consisting of lean mass like muscle. In contrast, the model calculated that exercise alone resulted in participants losing only fat, and no muscle. The simulation of exercise alone also estimated a small increase in lean mass despite overall weight loss.

The simulations also suggest that the participants could sustain their weight loss and avoid weight regain by adopting more moderate lifestyle changes—like 20 minutes of daily vigorous exercise and a 20 percent calorie restriction—than those demonstrated on the television program.

More than two-thirds of U.S. adults age 20 and older are overweight or obese, and more than one-third of adults are obese. Excess weight can lead to type 2 diabetes, heart disease, high blood pressure, stroke, and certain cancers.

"This study reinforces the need for a healthy diet and exercise in our daily lives," said NIDDK Director Dr. Griffin P. Rodgers. "It also illustrates how the science of metabolism and mathematical modeling can be used to develop sound recommendations for sustainable weight

loss—an important tool in the treatment of obesity—based on an individual's unique circumstances."

Provided by National Institute of Diabetes and Digestive and Kidney Diseases

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