

Does exercise facilitate body weight control? The answer may depend on sex

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Healthcare practitioners regularly prescribe diet and exercise as a method for patients to lose weight. But exercise might not be equally effective in males and females, according to new research conducted at

the University of Colorado, Anschutz Medical Campus.

In a study conducted in rats, graduate student Rebecca Foright fed both male and female rats a [high fat diet](#) and then trained half of them to run on a treadmill. After a total of 10 weeks, there was a remarkable sex difference in response to the [exercise](#) training. Male rats who exercised ate less food and gained less weight than sedentary males. Exercising [female rats](#) did not reduce their food intake. At the end of the study they weighed the same as sedentary females. When this study was repeated in males fed a [low fat diet](#), the research team found that the impact of exercise on body weight was evident even sooner than in the high fat diet fed male rats.

These findings will be presented this week at the Annual Meeting of the Society for the Study of Ingestive Behavior, the leading scientific society for research into all aspects of eating and drinking behavior.

Other researchers have reported that a single bout of exercise leads to an increase in interleukin-6 (IL-6) in the hypothalamus of male rodents. The hypothalamus is a brain area playing a key role in monitoring signals from the body to properly regulate feeding behavior. IL-6 is produced by muscle cells during acute bouts of [strenuous exercise](#), and it may also be produced in the brain with exercise. Studies have shown that IL-6 could mediate the beneficial effects of exercise on body weight regulation, by enhancing the brain's response to hormones that suppress [food intake](#).

Surprisingly, this story of IL-6 and acute exercise does not readily translate to the exercise-trained condition. When researchers from the University of Colorado measured IL-6 in their studies, they found that exercise-trained male rats had decreased hypothalamic IL-6, while the exercised females had increased IL-6. They believe that chronic exercise, unlike a single bout of exercise, may be imparting the sex specific differences in [body weight](#) control through differential effects

on hypothalamic inflammation, rather than by acutely altering local concentrations of IL-6.

Despite an increased prevalence of obesity in women and physiological differences between males and females in the hormonal signals and brain processes that influence appetite, the vast majority of mechanistic studies on obesity and treatment are performed in male animals. Foright says, "I hope that this research inspires other investigators to examine a female-specific response in their animal models. It is unacceptable to simply assume that females will respond to interventions in the same manner as males." She and her research team will continue to study female physiology to understand these sex-specific differences of [exercise training](#).

Provided by Society for the Study of Ingestive Behavior

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