# Exercise suppresses appetite by affecting appetite hormones

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A vigorous 60-minute workout on a treadmill affects the release of two key appetite hormones, ghrelin and peptide YY, while 90 minutes of weight lifting affects the level of only ghrelin, according to a new study. Taken together, the research shows that aerobic exercise is better at suppressing appetite than non-aerobic exercise and provides a possible explanation for how that happens.

This line of research may eventually lead to more effective ways to use exercise to help control weight, according to the senior author, David J. Stensel of Loughborough University in the United Kingdom.

The study, "The influence of resistance and aerobic exercise on hunger, circulating levels of acylated ghrelin and peptide YY in healthy males," appears in the online edition of the American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, published by The American Physiological Society. The authors are David R. Broom, James A. King and David J. Stensel of Loughborough University, and Rachel L. Batterham of University College, London.

**Treadmill versus weight lifting**

There are several hormones that help regulate appetite, but the researchers looked at two of the major ones, ghrelin and peptide YY. Ghrelin is the only hormone known to stimulate appetite. Peptide YY suppresses appetite.

Ghrelin was discovered by researchers in Japan only about 10 years ago and was originally identified for its role as a growth hormone. Only later did its role in stimulating appetite become known. Peptide YY was discovered less than 25 years ago.

In this experiment, 11 male university students did three eight-hour sessions. During one session they ran for 60 minutes on a treadmill, and then rested for seven hours. During another session they did 90 minutes of weight lifting, and then rested for six hours and 30 minutes. During another session, the participants did not exercise at all.

During each of the sessions, the participants filled out surveys in which they rated how hungry they felt at various points. They also received two meals during each session. The researchers measured ghrelin and peptide YY levels at multiple points along the way.

They found that the treadmill (aerobic) session caused ghrelin levels to drop and peptide YY levels to increase, indicating the hormones were suppressing appetite. However, a weight-lifting (non-aerobic) session produced a mixed result. Ghrelin levels dropped, indicating appetite suppression, but peptide YY levels did not change significantly.

Based on the hunger ratings the participants filled out, both aerobic and resistance exercise suppressed hunger, but aerobic exercise produced a greater suppression of hunger. The changes the researchers observed were short term for both types of exercise, lasting about two hours, including the time spent exercising, Stensel reported.

"The finding that hunger is suppressed during and immediately after vigorous treadmill running is consistent with previous studies indicating that strenuous aerobic exercise transiently suppresses appetite," Stensel said. "The findings suggest a similar, although slightly attenuated response, for weight lifting exercise."

**Focus on active ghrelin**

Previous studies have been inconclusive about whether exercise decreases ghrelin levels, but this study may help explain those mixed results, according to the researchers.

Ghrelin comes in two forms, acylated and non-acylated. The researchers measured acylated ghrelin, also called active ghrelin, because it can cross the blood-brain barrier and reach the appetite center in the brain. Stensel suggests that future research concentrate on active ghrelin.

While the study showed that exercise suppresses appetite hormones, the next step is to establish whether this change actually causes the suppression of eating.

Source: American Physiological Society