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Voluntary exercise and energy balance

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Physical exercise alone generally fails to produce meaningful weight loss in obese individuals, and reduced non-exercise activity has been suggested to explain this observation.

Daniel Lark, PhD, and colleagues explored how interactions between exercise (voluntary wheel running) and non-exercise activity ("off-wheel" activity) affect energy balance in mice.

They continuously monitored mouse behavior, energy intake and energy expenditure with locked running wheels (no exercise) for four days, followed by unlocked running wheels for nine days.

The researchers reported in the journal *Diabetes* that when running wheels were unlocked, mice engaged in voluntary exercise, which increased their energy expenditure and resulted in a negative energy balance. However, wheel running caused mice to decrease their off-wheel activity, such as roaming behavior. This reduction in non-exercise activity blunted the negative energy balance.

The study is the first to report an independent contribution of non-exercise physical activity to energy expenditure and energy balance in mice. By doing so, the study provides a model to further study mechanisms that regulate body weight.

More information: Daniel S. Lark et al. Reduced Nonexercise Activity Attenuates Negative Energy Balance in Mice Engaged in Voluntary Exercise, *Diabetes* (2018). DOI: 10.2337/db17-1293

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