

## Burning fat and carbohydrate during exercise

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In a paper published in *The Journal of Physiology*, researchers from Copenhagen shed light on fat oxidation during exercise and physical activity. Their observations suggest that fat oxidation during exercise reflects a fine interplay between the cardiovascular, neurological, endocrine and muscle metabolic systems.

During exercise and physical activity, the primary fuels used by muscles are carbohydrate and fat. When mild exercise is performed there is a tendency to burn relatively more fat and less glucose, but as exercise becomes more intense, a higher fraction of the energy demands of the muscle are supplied by glucose, until at the highest intensities almost only carbohydrates are used. Is this shift in fuel source a property of the muscle itself, or does it represent the interplay between what is happening in the muscle and the exercise-related responses in the rest of the body?

The study, performed at the Copenhagen Muscle Research Centre at the University of Copenhagen, examined muscle fuel utilisation in response to graded exercise performed with only one leg. Nine healthy males performed one-leg exercise at 25, 45, and 85% of maximal workload.

Their results showed that, when only a small mass of muscle is contracting, and blood flow and oxygen supply are not limited by central circulatory capacity, the shift in fuel source from fat to glucose as exercise intensity increases does not occur.



Helge et al.'s findings show that the adaptations in the rest of the body are the key to this fuel source shift during whole body exercise.

They also help scientists understand why athletes "hit the wall" during events like the marathon, and they have implications for the adaptations made in middle-aged adults who are using exercise to prevent or treat conditions like diabetes and obesity.

If the mechanisms can be fully understood, it may be possible to develop agents that allow fat oxidation to be maintained even during intense exercise with a large muscle mass.

Source: Blackwell Publishing Ltd.

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