

The fitter you are the better you burn fat

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Females who are fit and healthy tend to burn more fat when they exercise than men, according to new research from a team of sports nutritionists.

The research, comprising two new studies from academics led by the

University of Bath's Centre for Nutrition, Exercise & Metabolism, analyzed the factors that most influenced individuals' capacity to burn [body fat](#) when undertaking endurance sports.

How the body burns fat is important to all of us for good metabolic health, insulin sensitivity and in reducing the risk of developing Type II diabetes. But, for endurance sport competitions, such as running or cycling, how the body burns fat can make the difference between success and failure.

Previous research from the same team has shown how, for endurance athletes competing in distance events, the body's carbohydrate stores deplete quickly when exercising. This means that an athlete's ability to tap into their fat reserves to fuel them on becomes essential to their performance.

The first study, published in the *International Journal of Sport Nutrition & Exercise Medicine*, involved 73 [healthy adults](#) aged 19-63 (41 men; 32 women). It tested the lifestyle and [biological factors](#) for optimal fat burning by asking participants to take part in a cycling fitness test and measuring key indicators.

Their results found that females and those who were physically fitter, right across the age ranges, burnt fat more efficiently when exercising.

The second related paper, published in the journal *Experimental Physiology*, took this a stage further to explore what molecular factors in our muscles and fat tissue determine how fat is burnt. This experiment involved the researchers taking fat and muscle biopsies from participants to analyze how differences in the proteins in fat and muscle tissue might affect their ability to burn fat.

It found that the proteins in muscle that are involved in breaking down

stored fat into the smaller fatty acids, and proteins involved in transporting those fatty acids into the mitochondria in muscle (the powerhouse of the cells) consistently correlated with a greater ability to burn fat. The molecular factors explored did not explain why females burned more fat than males, however.

Lead author on both papers, Ollie Chrzanowski-Smith from the University of Bath explains: "Our study found that females typically have a greater reliance upon fat as a [fuel source](#) during exercise than males. Understanding the mechanisms behind these sex differences in fuel use may help explain why being female seems to confer a metabolic advantage for insulin sensitivity, an important marker of metabolic health."

The researchers note that the ability to burn fat as a fuel appears to protect against future weight gain, ensuring good weight management. However, they caution that the body's ability to burn fat should not be equated with an ability to lose weight. Losing weight is primarily produced by an energy deficit (ie. consuming fewer calories than we expend). For weight loss, in particular where individuals might be overweight, they stress the importance of diet and exercise.

Dr. Javier Gonzalez, also from the University of Bath's Department for Health, added: "Weight management is mainly about energy balance, so to lose weight we need to eat fewer calories than we expend through our resting metabolism and physical activity. However, people with a higher ability to burn fat as a fuel seem to be somewhat protected against future [weight](#) gain, which might be related to how fat burning affects food intake and energy expenditure.

"Ultimately, a greater capacity to burn fat as a [fuel](#) has potential benefits for endurance athletes, by delaying the timepoint when they run out of precious carbohydrate stores."

More information: Oliver J. Chrzanowski-Smith et al, Determinants of Peak Fat Oxidation Rates During Cycling in Healthy Men and Women, *International Journal of Sport Nutrition and Exercise Metabolism* (2021). [DOI: 10.1123/ijsnem.2020-0262](https://doi.org/10.1123/ijsnem.2020-0262)

Provided by University of Bath

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