



# Get the facts about coffee, caffeine and sports performance

## Did you know?



### Caffeine improves physical performance

The effects of coffee are linked to caffeine, rather than to coffee itself<sup>1</sup>



### Caffeine improves performance during endurance exercise

The effect of caffeine is most evident in endurance sports lasting more than five minutes

It has also shown a reduction in muscle pain in running, cycling and rowing<sup>2</sup>



### Caffeine may increase adrenalin production during exercise

For both aerobic and anaerobic exercises, caffeine most likely exerts its effect via caffeine-mediated antagonism of the adenosine receptors in the brain - a pathway that leads to an increased production of adrenalin, which stimulates energy production and improves blood flow to the muscles and heart<sup>4</sup>



### Caffeine does not adversely impact fluid balance during exercise

Caffeine has no significant effect on fluid balance

Statements suggesting the avoidance of caffeinated beverages before and during exercise are unfounded<sup>4</sup>



### Caffeine improves short-term high intensity performance

Caffeine has an ergogenic effect in trained athletes performing high-intensity exercises and team sports<sup>3</sup>

It is widely accepted that any effects of coffee consumption on sports performance are linked to the caffeine in coffee. Most of the published work on exercise performance focuses on the effects of caffeine, rather than coffee itself.

Research suggests that performance benefits can be seen with more moderate amounts of caffeine (around 3mg/kg body weight) across a range of sports, including endurance events, stop-and-go events such as team and racquet sports and sustained high-intensity activity such as swimming and rowing.<sup>1</sup> As well as its potential to reduce muscle pain during endurance exercise<sup>2</sup>, and reduce muscle soreness after strength exercises<sup>6,7</sup>, caffeine can also help during the recovery period by improving the renewal of glycogen (muscle energy stores) when consumed with carbohydrate.<sup>8</sup>

The European Food Safety Authority (EFSA) published its Scientific Opinion in 2015 on the Safety of Caffeine concluding that 'single doses of caffeine up to 200mg (about 3mg/kg bw) from all sources do not raise safety concerns for the general adult population, even if consumed less than two hours prior to intense physical exercise under normal environmental conditions'.<sup>9</sup>

## References

1. Burke L.M. [2008] Caffeine and sports performance. *Appl Physiol Nutr Metab.* 33(6):1319-34. doi: 10.1139/H08-130.
2. Hodgson A.B. et al. [2013] The metabolic and performance effects of caffeine compared to coffee during endurance exercise. *PLoS One.* 8(4):e59561.
3. Davis J.K. et al. [2009] Caffeine and Anaerobic Performance - Ergogenic Value and Mechanisms of Action *Sports Medicine*, 39, 813-832.
4. Killer S. C. et al. [2014] No Evidence of Dehydration with Moderate Daily Coffee Intake: A Counterbalanced Cross-Over Study in a Free-Living Population. *PLoS ONE*, 9(1): e84154.
5. Pedersen D.J. et al. [2008] High rates of muscle glycogen re-synthesis after exhaustive exercise when carbohydrate is co-ingested with caffeine. *J Appl Physiol.* 105(1):7-13
6. Duncan M.J. et al. [2012] Acute caffeine ingestion enhances performance and dampens muscle pain following resistance exercise to failure. *J Sports Med Phy Fitness.* Vol 52 (3):280-5
7. Hurley C.F. et al. [2013] The effect of caffeine ingestion on delayed onset muscle soreness. *J Strength Cond Res.* Vol 27 (11) 3101-9
8. Pedersen D.J. et al. [2008] High rates of muscle glycogen re-synthesis after exhaustive exercise when carbohydrate is co-ingested with caffeine. *J Appl Physiol.* 105(1):7-13
9. European Food Safety Authority [2015] Scientific Opinion on the Safety of Caffeine. EFSA, Parma, Italy. Available at: <http://www.efsa.europa.eu/en/consultations/call/150115.pdf>
10. Goldstein E.R. et al. [2010] Position Stand: caffeine and performance. *J. International Society of Sports Nutrition* Available at: [www.jissn.com/content/7/1/5](http://www.jissn.com/content/7/1/5)

The International Society of Sports Nutrition issued a [position statement](#) on caffeine supplementation and sports performance in 2010.<sup>10</sup>

Further information on fluid balance can be found on the [Coffee & Health website](#).