

Olympic gold? A new effect of caffeine boosts performance

June 29 2010

New research shows increased muscle performance in sub-maximal activities, which in humans can range from everyday activities to running a marathon.

With no current regulations in place, the scientists from Coventry University believe their findings may have implications for the use of [caffeine](#) in sport to improve performance.

The scientists present their work at the Society for Experimental Biology Annual Meeting in Prague on Wednesday 30th June 2010.

"A very high dosage of caffeine, most likely achieved via tablets, powder or a concentrated liquid, is feasible and might prove attractive to a number of athletes wishing to improve their athletic performance", explains lead researcher, Dr Rob James.

"A small increase in performance via caffeine could mean the difference between a gold medal in the Olympics and an also-ran", he added.

Caffeine is not currently listed by the World Anti-Doping Agency (WADA) as a banned substance at any concentration in blood or urine samples. Before 2004 WADA did set a specific level over which athletes could be banned, but this restriction was removed.

[Muscle activity](#) is divided into maximal, where the muscles are pushed to full capacity such as in sprinting or weight lifting, and sub-maximal,

which covers all other activities.

A member of the team, Jason Tallis, tested the effect of caffeine on both the power output and endurance of soleus muscles (lower leg muscle) in [mice](#), under both maximal and sub-maximal activities.

He found that a caffeine dosage of 70 μM enhanced power output by ~6% during both types of activity. This effect in humans is likely to be very similar, according to the researchers.

"70 μM caffeine concentration is the absolute maximum that can normally achieved in the blood plasma of a human, however concentrations of 20-50 μM are not unusual in people with high caffeine intakes", explains Dr James.

Resultant caffeine in blood plasma (70 μM maximum) may act at receptors on skeletal muscle causing enhanced force production. Scientists already know that ingestion of caffeine can increase [athletic performance](#) by stimulating the central nervous system.

Additionally, 70 μM caffeine treatment increased endurance during sub-maximal activity, but significantly reduced [endurance](#) during maximal activity.

Provided by Society for Experimental Biology

Citation: Olympic gold? A new effect of caffeine boosts performance (2010, June 29) retrieved 25 May 2024 from <https://medicalxpress.com/news/2010-06-olympic-gold-effect-caffeine-boosts.html>

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