

PERFORMANCE NUTRITION

PERFORMANCE NUTRITION HELPS DECIPHER THE LATEST RESEARCH TO **HELP YOU OPTIMISE YOUR TRAINING DIET AND SUPPLEMENTATION**

BY JAMES COLLINS

TAURINE: PERFORMANCE ENHANCER OR A LOAD OF BULL?

Taurine is a sulphonic amino acid found naturally in food, especially meat and seafood; it is also an active ingredient in many popular commercial energy drinks. Urban legend suggests that taurine was first extracted from the testicles of bulls; thankfully today's commercially available taurine is synthesised chemically. Taurine has been promoted (largely by the energy drink manufacturers) as improving athletic performance, and a recent study published in *Amino Acids* has found that an acute intake of taurine improved 3 km running performance in trained runners.

MAIN FINDINGS

The main finding from the paper was that 7 of the 8 runners completed the 3 km time trial quicker after an acute intake of taurine, in comparison to the placebo. This equated to a 1.7% average improvement in running performance.

No differences in physiological measures such as blood lactate, expired gas or heart rate were found. Additionally, the prior intake of

taurine did not affect perceived exertion during the run.

SIGNIFICANT METHODOLOGY

Eight competitive male middle-distance runners, who undertook a minimum of 45 miles of running each week completed the study. They attended the laboratory on two occasions and both times completed a 3 km running time trial. Two hours before each trial the runners were provided with a capsule that contained either a 1000 mg dose of taurine (the amount typically found in commercial energy drinks) or an empty placebo capsule. Capillary blood lactate was measured immediately before and after completion of the time trial. Expired gas, heart rate and ratings of perceived exertion were measured at 500 metre intervals during the run.

TAKE-HOME MESSAGE

This study provides evidence that an acute 1000 mg dose of taurine taken 2 hours before exercise may improve athletic performance. Previous studies

have failed to find such a performance enhancement, but the authors of the current study suggest that this was because these studies utilised a 1-hour ingestion period rather than the 2-hour period used in their study, which has been defined as optimal for maximising taurine levels in the blood.

The mechanisms responsible for the possible performance benefits of taurine are not currently known, but it has been speculated that the ingestion of this amino acid might



PHOTODISC

lead to greater stimulation of the neuromuscular system.

Further research is required before taurine ingestion can be recommended as a nutritional strategy pre-exercise. There is, nevertheless, strong evidence that caffeine ingestion before both aerobic and resistance-type exercise can provide

a performance benefit. Whilst some commercial energy drinks provide both caffeine and taurine, the fact that they are carbonated and typically have a very strong flavour means that they can cause gastrointestinal discomfort during exercise. Athletes should also consider other methods for their caffeine

strategy, such as chews, isotonic drinks, gum, coffee and tablets. Trial and error is required to find the optimal dose and timing, as the response is highly individual.

REFERENCE:

Balshaw TG, Bampouras TM, Barry TJ, Sparks SA (2012) **The effect of acute taurine ingestion on 3-km running performance in trained middle-distance runners.** *Amino Acids*. [Epub ahead of print]

CAFFEINE: KEY TO REDUCING THE PERCEPTION OF EFFORT?

Caffeine has been shown to improve both mental and physical performance, but the mechanisms responsible for these effects are not yet fully understood. The ergogenic effects of caffeine have been previously attributed to adenosine antagonism (stimulating the central nervous system), neurotransmitter release and fatty acid mobilisation (and associated glycogen sparing). It has recently been suggested that the analgesic (pain-relieving) effects blunting perceived exertion during exercise, could be a viable explanation. A recent study published in the *European Journal of Applied Physiology* has found that the intake of caffeine before exercise can reduce the perceived effort (or exertion) of a set exercise session.

MAIN FINDINGS

This double-blind study found that, when compared to a placebo, the intake of caffeine reduced ratings of perceived exertion (RPE) over a 30-minute exercise session. Furthermore, during exercise participants reported lower RPE specific to their legs and breathing after consuming caffeine. It is important to highlight, however, that the results from a post-exercise survey revealed commonly known side effects of caffeine (feelings of nervousness, restlessness and stomach distress), which were not present in the placebo group.

SIGNIFICANT METHODOLOGY

Fifteen healthy male and female individuals with varying aerobic fitness levels took

part in the study, which involved a total of three separate visits to the laboratory. Participants completed a VO₂ max test on the first. On the following visits a 30-minute exercise session was completed at 75% VO₂ max on a cycle ergometer. These trials were completed after consuming a capsule containing either 6 mg/kg bodyweight of caffeine or maltodextrin (placebo). Participants were instructed to avoid alcohol and caffeine for 4 days prior to each testing session. Participants were well rested and provided with water to ensure that they were adequately hydrated. Measures of heart rate, RPE (overall), RPE (legs) and RPE (breathing) were recorded every 5 minutes during the exercise session and RPE (session) was assessed 30 minutes after cessation of exercise.

TAKE-HOME MESSAGE

Athletes involved in a variety of sports can benefit from the intake of caffeine before training, due to its ability to not only improve physiological performance but also increase mental alertness and concentration. Caffeine also appears to have an analgesic effect during exercise, which plausibly accounts for at least some of the performance benefits associated with this stimulant.

Responses to caffeine intake are highly individual and therefore the optimal dose will differ between athletes. Those habitually consuming lots of caffeine (e.g. large daily coffee consumption) will likely need a slightly higher dose to achieve the same ergogenic effect. Importantly, a high dose of caffeine (such as the 6 mg/kg body-

weight dose in the present study) can result in a number of side effects, such as increased nervousness, tremors, restlessness and stomach distress. Athletes should also be mindful that high doses of caffeine could potentially mask the body's usual feedback mechanisms, leading to a greater risk of overtraining during high volumes of training. It is vital that athletes experiment with different doses of caffeine prior to training sessions in order to establish a dose that works for them. This should start with smaller doses (such as 0.5-1 mg/kg bodyweight), as for some this can be an ergogenic dose. **M&F**



PHOTO: JSC

REFERENCE:

Killen LG, Green JM, O'Neal EK, McIntosh JR, Hornsby J, Coates TE (2012) **Effects of caffeine on session ratings of perceived exertion.** *European Journal of Applied Physiology*. [Epub ahead of print]

Performance Nutrition is a unique London-based consultancy, providing comprehensive support to elite and recreational athletes. Director, James Collins, is a leading Sport and Exercise Nutritionist, working with Great Britain Elite Sports in preparation for the Olympic Games and as Head Nutritionist for Arsenal FC. For further information visit www.theperformancenutritionist.com