PERFORMANCE NUTRITION

DECIPHERING THE LATEST SCIENTIFIC RESEARCH TO HELP YOU GET THE MOST FROM YOUR TRAINING, DIET AND SUPPLEMENTATION

BY MARK HOBDEN AND JAMES COLLINS

IS DRINKING RED WINE A NATURAL WAY TO BOOST TESTOSTERONE LEVELS?

There is growing evidence that drinking red wine could provide multiple health benefits because of its abundance of antioxidants, particularly resveratrol and quercetin. These are known to reduce oxidative cell damage in the body and their intake has been associated with reduced risk of cardiovascular disease and certain cancers.

A recent laboratory study at Kingston University found some of the compounds in red wine also interact with the endocrine system. They inhibit an enzyme that is involved in the removal of the performance-enhancing hormone testosterone from the body. Testosterone has an anabolic effect and promotes the strengthening of muscles, fortification of tendons and ligaments and the repair and toughening of bones. The scientists at Kingston suggested therefore that drinking red wine could result in elevated circulating levels of testosterone, which raises the question whether this could provide performance benefits to athletes.

MAIN FINDINGS

A range of red wine concentrations inhibited the enzyme UGT2B17, which helps to eliminate testosterone from the body by up to 70% over a 2-hour period. This response was largely attributable to the quercetin content of red wine (72%), but also caffeic acid (22%) and gallic acid (9%).

The alcohol content of the red wine had no affect on testosterone metabolism.

SIGNIFICANT METHODOLOGY

This study focused on red wines ranging from 2–8% concentrations. Specialist techniques were used to determine the inhibitory effects of red wine on enzyme UGT2B17. The study also used analytical methods to identify the antioxidant components in red wine that were responsible for this inhibitory effect. It should be noted that the study was lab-based and not tested on humans.

TAKE-HOME MESSAGE

Antioxidant compounds in red wine were shown to have an inhibitory effect on the systems responsible for removing testosterone from the body. Green and black tea have previously been found to have similar properties and it is likely that other food sources rich in quercetin, such as sweet potato, onions and apples, could have the same effect. Additional studies are now required to determine:

1) *whether these compounds result in an increased systemic circulation of testosterone in a real-life setting.*

2) *what dose is required to achieve this effect.*

Remember—excessive alcohol consumption can have a negative impact on hydration status, sleep quality, exercise recovery and body composition. Furthermore, chronic intake of large amounts of alcohol can actually decrease circulating testosterone levels.

REFERENCE

Jenkinson C, Petroczi A, Naughton DP (2012) **Red wine and component flavonoids inhibit UGT2B17 in vitro.** *Nutrition Journal*, 11:67

MUSCLE CRAMPING—IS DEHYDRATION THE MAIN CULPRIT?

Many people experience painful muscle cramps during or shortly after strenuous exercise. The cause of these cramps is not fully understood but one of the most popular theories is based on the loss of fluids and electrolytes (sodium, potassium and magnesium) via sweat. According to the theory, significant sweating causes a fluid shift in the body that increases pressure on selected nerves in the exercising muscles. This alters the neural activity of the nerves and triggers the onset of cramp.

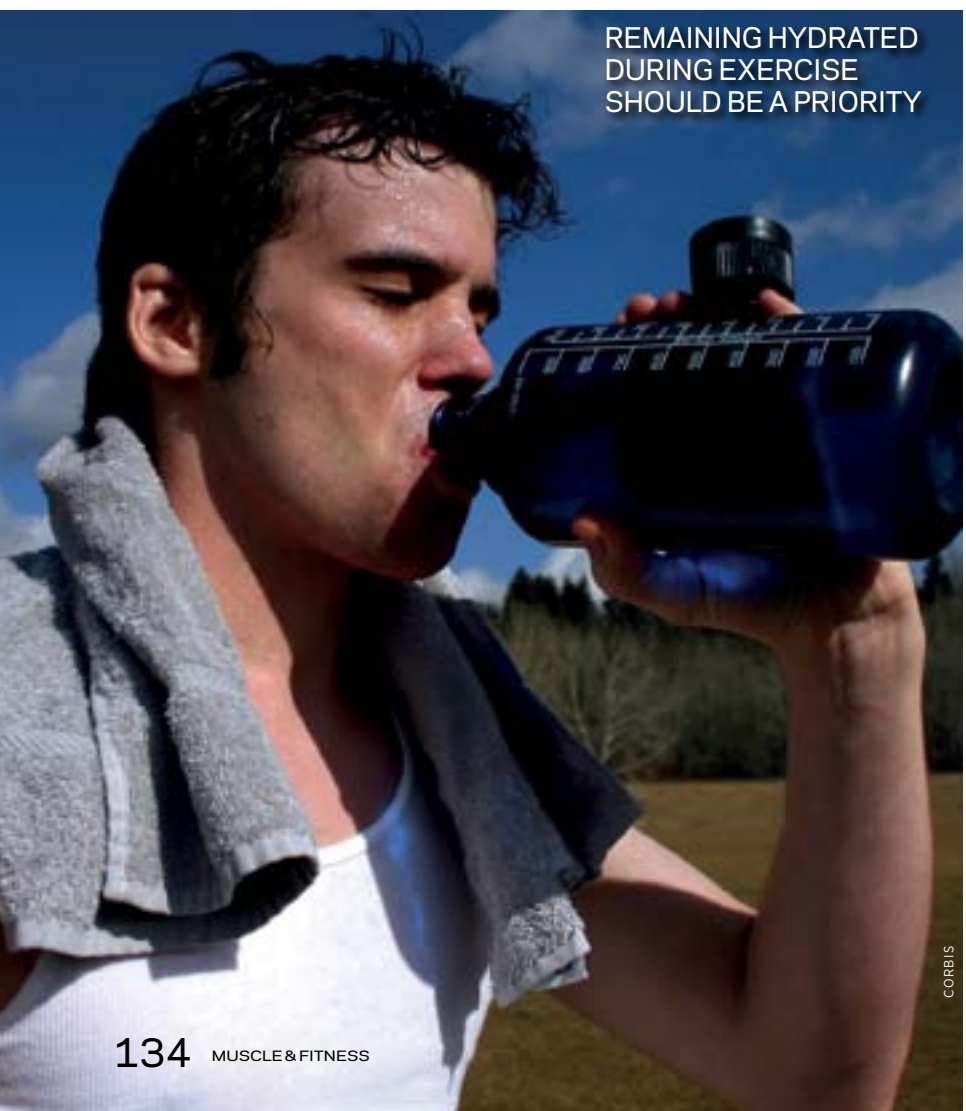
Many companies include electrolytes in their sports drinks and advise that replacing fluid and electrolytes could help reduce the risk of muscle cramps but there has been very little research into this claim. Furthermore, findings from a new study throw this theory into doubt, with the authors concluding that neuromuscular fatigue, and not dehydration or electrolyte losses, may be the most influential factor in the onset of muscle cramps.

MAIN FINDINGS

Significant loss of fluids and electrolytes (sodium and potassium) did not influence any factors related to the onset of cramp, including cramp threshold frequency, cramp intensity or electrical activity in the muscles during cramp.

SIGNIFICANT METHODOLOGY

Ten male volunteers took part in this study, which involved one familiarisation session and one testing day. On the testing day the men arrived at the testing facilities in a euhydrated state, which means they had normal hydration levels. Muscle cramps were induced in all of them by electrical stimulation in their dominant leg. They were then required to complete an exercise session in an environmental chamber set at approximately 39°C until they had lost 5% of their body mass in sweat. Following this the muscle cramp procedure was repeated.



REMAINING HYDRATED DURING EXERCISE SHOULD BE A PRIORITY

CORBIS

TAKE-HOME MESSAGE

The findings suggest fluid and electrolyte losses during exercise do not cause the onset of muscle cramps. The authors of the study recommend that "strategies to increase neuromuscular endurance or correct muscle imbalances may be more successful at minimising the onset of exercise-associated muscle cramps than rehydration or electrolyte replenishment strategies".

Nevertheless, remaining hydrated during exercise should be a priority for athletes because losing as little as 1–2% of body mass has been shown to decrease cognitive and physical performance.

Although consuming electrolytes during exercise may not reduce the risk of cramps, evidence suggests it may allow for quicker rehydration and also, importantly, help reduce the risk of a life-threatening condition called hyponatraemia, which is caused by low sodium levels in the blood during endurance events. Performers should therefore consider using sports drinks during intense exercise lasting more than one hour because they are an excellent source of electrolytes, fluids and rapid-release energy. **M&F**

REFERENCE:

Braulick KW, Miller KC, Albrecht JM, Tucker JM, Deal JE (2012) **Significant and serious dehydration does not affect skeletal muscle cramp threshold frequency.** *British Journal of Sports Medicine*, 10:1136

Performance Nutrition is a London-based consultancy that supports elite and recreational athletes. Director James Collins is a sport and exercise nutritionist and head nutritionist for Arsenal FC. Head of research and development Mark Hobden is completing a doctorate in nutrition at the University of Reading and has degrees in sports biology and sport and exercise nutrition. He has also worked for the Gatorade Sports Science Institute, the Porsche human performance team at Silverstone and in professional rugby. For more information visit **www.theperformancenutritionist.com**