

# dietary supplementation

ESSENTIAL NUTRIENTS IN A PILL CAN SEEM LIKE THE IDEAL, CONVENIENT SOLUTION IF YOU NEED TO SUPPLEMENT YOUR DIET. HOWEVER, IT IS IMPORTANT TO FULLY UNDERSTAND THE BENEFITS AND RISKS BEFORE YOU DECIDE TO TAKE THEM

REPORT BY BECKY STEVENSON

**S**upplementation is one of hottest debates in the sporting community. Athletes and fitness professionals are bombarded with promotional information from sports supplement companies who make performance-enhancing claims for their products. Many athletes and coaches do not understand the mechanism, evidence and protocols for many of these supplements, yet athletes are often approached by these companies to endorse their products. Professor Ron Maughan, sports scientist at Loughborough University, believes that athletes need to weigh up the potential benefits and risks carefully before deciding to use dietary supplements.<sup>1,16</sup>

## **multivitamins**

### **pros**

- They can be used if an athlete is restricting food intake to reduce body fat levels, leading to likely nutrient deficiency.
- They can also be used if there is a long period of training away from home, which may compromise diet quality. Under these circumstances, use a multivitamin complex 30% DRV (British Dietary Reference Value).

### **cons**

- However, wherever possible, athletes should not be encouraged to use multivitamins to compensate for poor diets. Ideally, they should be able to satisfy basic nutrient requirements by eating a balanced, varied diet.

## **iron supplementation**

### **pros**

- It may be required in female athletes who have heavy menstrual losses or vegetarian athletes who may be at risk of iron deficiency.

### **cons**

- Iron supplementation should only be implemented following iron screening by the GP or sports doctor.

## **calcium supplementation**

### **pros**

- This is beneficial for sufferers of osteoporosis, who are recommended to take 1,200mg/day. The normal daily calcium requirement is 700mg (National Osteoporosis Society).

### **cons**

- Studies are not conclusive on whether increasing calcium intake prevents fractures or whether giving high-dose calcium will make a difference if an athlete has a stress fracture.

### **additional information**

- 1 pint skimmed milk – 600mg
- 1 carton plain yoghurt – 300mg
- 1 portion cheddar cheese – 245mg
- 1 can sardines – 400mg

## **antioxidants**

During aerobic metabolism, fats, carbohydrates and protein combine with oxygen to generate energy by producing “free radicals”. These free radicals are transient, sometimes called “reactive oxygen species” (ROS). They can cause free radical damage (damage to cell membrane and DNA) if unchecked. Our bodies have a defence mechanism to neutralise the “free radicals”. Scientists believe that gradual biological changes through an accumulation of “free radical damage” can lead to degenerative diseases such as cancer and heart disease.

### **pros**

- Athletes may benefit from much higher levels of antioxidant nutrients to help protect them against the higher risk of free radical damage.
- Reduced muscle soreness has been shown after taking vitamin C post-shuttle running.<sup>2</sup>
- Vitamin C and E supplements were shown to decrease damage to immune cells in women post-exercise.<sup>3</sup>
- Vitamin E supplements were shown to enhance muscle repair in downhill running.<sup>4</sup>
- Significant reduced muscle soreness was seen in a study supplementing with 3g vitamin C per day two weeks before heavy exercise and four days post-exercise compared to placebo group.<sup>5</sup>

Cyclists given a sports drink with added antioxidants had reduced post-exercise muscle soreness and muscle damage markers.<sup>6</sup>

### **cons**

- No reduction in post-exercise muscle damage in ultra-marathon runners taking 1,000mg vitamin C and 300mg vitamin E.<sup>7</sup>
- Taking high doses of supplements long-term can cause more harm than good in athletes. Therefore, it may be more beneficial to the athlete to include foods that have high-antioxidant activity.

### **additional information**

Antioxidants in food:

Phytochemicals – give fruit and vegetables their distinct colour.

Includes:

Carotenoid family – fruit and vegetables, carrots.

Flavonoids – found in citrus fruit, tea, red wine.

Tocotrienols – nuts, seeds, and wheatgerm.

Allyl Sulphide – onion, leeks and garlic.

The deeper the colour, the higher the phytochemical concentration, the higher the antioxidant activity.

# in sport – the pros and cons

## creatine

This is a naturally occurring compound found in muscle. The main dietary source is meat and fish and the body needs around 2g per day. Creatine phosphate is an important energy source in high-intensity exercise.

### pros

- Creatine monohydrate supplementation increases the muscles' creatine content.
- It allows for greater maintenance of high-intensity exercise.
- Helps recovery from high-intensity exercise.
- Used with resistance training, it helps increase lean body mass.
- It can also be taken for interval and sprint training – athletes required to repeat short explosive effort with brief recovery period, or intermittent work (soccer, rugby, racquet sports).

### cons

- Anecdotal reports of increased muscle cramps and tears
- Unsure of potential long-term risks
- Not recommended in athletes still maturing
- Contamination issues
- Promotes weight gain due to water retention

## additional information

Creatine protocol:

Rapid loading: 20g/day – four doses over five days, take with 50-100g carbohydrate with maintenance dose of 3g/day.

Slow loading: 3g/day with a maintenance dose of 3g/day.

Do not take with caffeine.

## caffeine

Caffeine is a mild stimulant – in the sporting world, until recently, caffeine was a “controlled or restricted” drug. The World Anti Doping Agency (WADA) lifted it from the list of banned substances in January 2004. Prior to this, athletes had previously been banned for testing positive for high levels of caffeine. This has reopened the controversial debate about using caffeine in sport.

### pros

- It has proven to improve endurance performance at low doses 3mg/kg/bwt.<sup>8,9,10,11</sup>
- Enhanced road cycle performance was evident using 6mg/kg/bwt caffeine taken before and during a time trial.<sup>12</sup>
- Caffeine added to sports drinks increased delivery of carbohydrate by 26%.<sup>13</sup>

### cons

- High doses 9-13mg/kg/bwt – headache, dizziness, insomnia, muscle tremor and impairment of coordination.<sup>14</sup>
- High-caffeine intake may affect insulin action in recovery.
- Mild diuretic, evidence shown no detrimental effect of caffeine fluid-electrolyte balance and exercise performance.<sup>15</sup>

## additional information

(FSA 2001) caffeine content of beverages:

- Cup of instant coffee 75mg
- cup of brewed coffee 100mg
- cup of tea 50mg
- regular cola drinks up to 40mg
- regular energy drink up to 80mg.

Recommended dosage: 3mg/kg/bodyweight

Test individual sensitivity to caffeine.

## summary

A number of supplements do not have enough scientific evidence to warrant their use. They can be costly and taken in high doses may cause harm. The athlete and coach need to weigh up the cost benefit of using supplements. Elite athletes need to consider the potential for contamination.<sup>16</sup> The best approach is to ensure the athlete is maximising their nutritional intake on a day-to-day basis before considering their use. **fp**

## references

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## resources

[www.nutritionociety.org.uk/senr](http://www.nutritionociety.org.uk/senr), [www.eis2win.co.uk](http://www.eis2win.co.uk), [www.proactivate.co.uk](http://www.proactivate.co.uk)



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