

Supercharge Me!

DR NICK KIMBER TACKLES THE TOPIC OF SPORTS SUPPLEMENTS AND ASKS THE QUESTION—DO WE NEED THEM?

There's a fair chance that most mountain bike riders out there have tried a sports supplement at some stage to assist their riding. A large range of supplements and sports foods are now available with claims of prolonged endurance, increases in muscle mass and strength, losses of body fat and resistance to illness, fatigue or infection. For athletes, coaches and even the weekend warrior, such promises are an inviting prospect, especially in a competitive environment where success can be determined by the smallest of margins.

The use of supplements among athletes and the general population appears to be widespread; however most of these individuals have a limited understanding about their safety and effectiveness. Increasing the awareness about supplements is therefore an important issue; however distinguishing legitimate claims from fictional advertising is often difficult, particularly when product revenue is the primary concern. Reading this article will certainly help you to become more sports supplements savvy, however be mindful that a comprehensive evaluation of the vast array of nutrition supplements available today is well beyond the scope of this magazine. It is also important to consider that optimum sports performance is a combination of genetics, training and appropriate nutritional practices. It is not a result of 'magic' supplements or ergogenic (performance-enhancing) aids that claim to make you bigger, stronger, leaner, faster and better at their sport.

The ever-growing range of sports supplements can be divided into two separate categories: dietary supplements and nutritional ergogenic aids.



DIETARY SUPPLEMENTS



Carbohydrate Gels and sports drinks are ideal in a race situation as they are very easy to consume!

Dietary supplements can be defined as products that:

- Help you meet known nutritional/physiological needs such as carbohydrates. Examples include sports drinks, sports bars, gels and liquid meal supplements.
- Provide nutrients in larger amounts to reverse a deficiency. For example, iron and calcium supplements.

Carbohydrate supplements such as sports drinks, sports bars and gels are used by a wide range of athletes and can certainly help with improving endurance and recovery for mountain biking. Sports drinks like Gatorade, Powerade, Staminade, Endura, High5 and PowerBar Endurance can be beneficial on rides or events lasting longer than 60 minutes as they provide an optimal delivery of glucose and electrolytes for delaying fatigue and preventing cramps. When deciding on the best sports drink to buy, the key factors are:

- Taste – Palatability is an important part of increasing fluid consumption dur-

ing exercise.

- Concentration of carbohydrate – It is best to buy a powder so you can alter the amount you add. A sports drink with 4-8% (i.e. 40-80g per litre or 4-8g per 100ml) carbohydrate is recommended.

- Type of carbohydrate – Glucose polymers can increase emptying rate from the stomach for a given concentration of glucose.

- Electrolyte composition & concentration – Higher sodium levels and magnesium can reduce cramps. A sports drink with 500-700mg/L (20-30 mmol/L) of sodium is suitable.

If you're competing in a mountain bike event, always familiarise yourself in training with any sports drink that you plan to consume during competition to minimise the risk of stomach upset and abdominal cramping.

Natural Alternatives

Additional carbohydrate can be provided by sports bars and gels. They will help support the increased rate of muscle fuel use during moderate to high-intensity riding. It should be considered however that whilst sports bars and gels are convenient and effective, they are expensive and generally offer no further enhancement of endurance compared with consuming the same amount of carbohydrate from whole foods like muesli bars, jelly beans or snakes, potatoes and jam sandwiches. I used to include bananas on this list but they're probably more expensive than supplements right now!

For endurance events lasting between 1-5 hours, studies indicate that around 30-60g of carbohydrate per hour should be consumed to delay fatigue. This is equivalent to 500-1,000ml of sports drink, 1 sports bar (Powerbar), 2 powergels (Powerbar), 2 medium bananas, 2 muesli bars or 10-20 jelly beans. For ultra-endurance events that are longer than 5 hours such as 24 hour events, approximately



You don't have to buy expensive carbohydrate supplements; alternatives include muesli bars, jelly babies, potatoes, jam sandwiches, bananas and more...



Make your own recovery drink—trim milk, low-fat yoghurt, skim milk powder and a banana.

1.0g of carbohydrate per kg of body weight is recommended to prevent the depletion of muscle and liver glycogen and the lowering of blood glucose that leads to fatigue. In addition to sports drinks, bars and gels, solid foods that are moderate to high in GI are suitable such as potatoes, jam sandwiches, biscuits and muesli bars.

Whey protein powders

Whey is the fluid portion of milk that is obtained by removing the curd (casein) during cheese production. Whey proteins are unique in that they contain high levels of the essential amino acids, which include lysine, methionine, cystine, and the branched-chain amino acids (leucine, isoleucine and valine). In addition to the potential for whey protein to improve muscle mass and lower body fat, whey is also known to improve antioxidant status and reduce post-exercise inflammation in skeletal muscle. Recovery after a training ride on the trails or a competitive mountain biking event can therefore be enhanced, if you have a quality protein powder like Aussie Bodies Perfect Protein (whey protein concentrate) blended together in water with some carbohydrate such as a banana or dried fruit, or simply mixed together with some soy or dairy milk.

If whey protein powders don't fit into your budget, there are more economical alternatives but these do not offer rapid increases in protein synthesis and have reduced antioxidant and anti-inflammatory effects. Examples include liquid meal supplements like Sustagen Sport or you can make your own protein drink by mixing 400ml of trim milk, 1 small tub of low-fat yoghurt, 2 tablespoons of skim milk powder and one banana.

ERGOGENIC AIDS

The second broad category of sports supplements are termed nutritional ergogenic aids which are often claimed to promise a direct and 'supra-physiological' benefit to sports performance and seem to be very appealing to the general and athletic population. These products contain nutrients in amounts that greatly exceed recommended levels and amounts normally found in food. The products are often marketed using unsubstantiated, exaggerated claims and testimonials from successful athletes but have little scientific evidence to back up the claims. Examples, which continually change in popularity, include:

- Mega-doses of vitamins - Vitamin E is the most researched but like other antioxidants, no improvement in performance trials has been found. Evidence suggests however that vitamin E supplementation can decrease muscle and oxidative damage in response to exercise.
- Some minerals - Chromium picolinate is claimed to improve muscle mass and enhance weight loss however very little evidence supports either of these claims.
- Branched chain amino acids - May offer a reduction in skeletal muscle breakdown but no effect on prolonging time to fatigue.
- Phosphate loading - Mixed results with endurance performance although there does seem to be some potential as an ergogenic aid.
- Ginseng and other herbal compounds - In human studies the popular Chinese herb ginseng does not appear to have any effect on endurance performance.
- Bee pollen - Despite being a rich source of vitamins, minerals and amino acids, no ergogenic benefits have been reported and it may even cause extreme

reactions in individuals with pollen allergies.

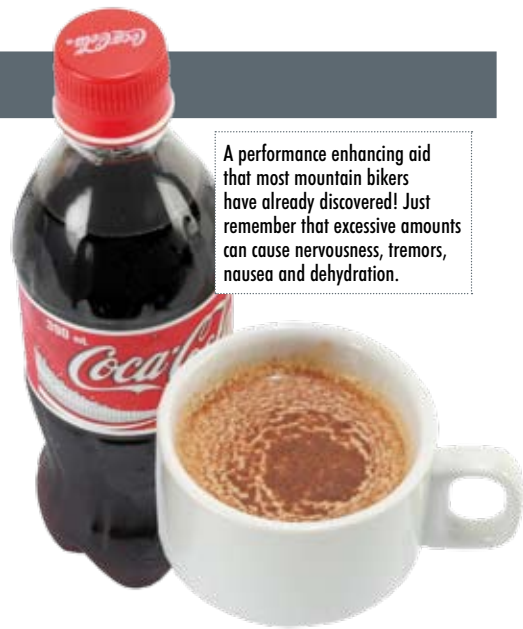
- Coenzyme Q10 - Also known as ubiquinone, supplementation has not shown any performance benefits and may actually cause cell damage under intense exercise conditions.
- Inosine and carnitine - Inosine is reported to increase ATP stores, however studies indicate a negative effect on performance and uric acid levels which can induce gout. Carnitine is speculated to enhance long-chain fatty acid transport across the mitochondria and thus increase fat oxidation, but no consistent effect on endurance performance has been demonstrated.

In general, these supplements have been poorly tested or have failed to live up to their claims when rigorous testing has been undertaken. At best, these substances make you feel more confident without actually exerting any other performance benefit (placebo effect). At worst, they may cause harmful side effects and waste a considerable amount of money.

A nutritional ergogenic aid that has some potential improved exercise performance is colostrum. This substance is the first mammary secretion provided for newborns just before the onset of lactation. It has an abundance of essential nutrients and bioactive components including growth factors, immunoglobulins, vitamins, minerals and amino acids. Oral bovine colostrum ingestion of 20g per day has been shown to provide a small but significant improvement in endurance cyclists and increases in lean body mass are reported after resistance training. However the lack of scientific validity and the expense of colostrum excludes it from being a recommended supplement.


The following supplements are exceptions to the majority of nutritional ergogenic aids. They are commonly known to enhance the performance of certain athletes under specific conditions and may indeed be of use to mountain bikers:

- Creatine - Serves to maintain levels of ATP during short bouts of high-intensity efforts and therefore is more useful for enhancing strength in the gym rather than out riding the trails. For the weekend warrior there is probably no need for creatine and any strength benefits are more likely to be experienced by elite riders. If you want to try creatine however, ensure you take the correct dosage for no more than 6 weeks at a time and be aware that fluid retention in the muscles may lead to weight gain.
- Caffeine - A nervous system stimulant and one of the most widely used drugs



A performance enhancing aid that most mountain bikers have already discovered! Just remember that excessive amounts can cause nervousness, tremors, nausea and dehydration.

in the world that can have large effects on endurance performance. Many studies (including my own independent research during training and competition!) clearly indicate that caffeine significantly increases performance time. Performance benefits are not dose dependent however; excessive supplementation may cause side effects such as nervousness, tremors, nausea and dehydration. Overall, beneficial effects begin to be detectable at intakes of 3mg/kg and no further effects are apparent above 5-6mg/kg.

In summary, it should be noted that a supplement should always be an addition to and will not replace a well-balanced eating plan. Before you consider taking a supplement, it is important to practice the healthy eating strategies outlined in the previous issue. You should always address the well-supported nutritional strategies for sport—such as achieving adequate fuel intake and maintaining your fluid levels. If you decide to use a dietary supplement or nutritional ergogenic aid for enhancing your mountain biking performance, ensure you familiarise yourself with the product before using it in a competitive environment. 

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Dietary supplements such as iron and calcium can help if you are deficient in any of these areas.