

## NUTRITION FOR MOUNTAIN BIKING

Competitive mountain biking can broadly be categorised into cross-country and downhill disciplines, though within each there are a range of events in which athletes can compete (see Table 1 below). Given the distinct physiological demands imposed by cross country and downhill racing, most elite level mountain bikers tend to specialise in one discipline. In cross-country races, athletes complete several laps of a 5-9 km circuit, which will include a significant amount of hill climbing and technical descents. Race durations range from 90-120 minutes right up to 24 hours. Elite level cross country riders require a large aerobic capacity and the ability to sustain a high percentage of this for a prolonged period of time.

Downhill mountain bike races typically last between 2 and 4 minutes, with riders competing at near maximal intensity for the duration of the event. Downhill mountain bikers need a high degree of strength to generate the large power outputs required, and a well-developed anaerobic capacity.

Regardless of the discipline, all elite riders need to develop the technical skills to be able to control and stabilise their bikes on the various off-road terrains they encounter.

### Training

Regardless of their specialist discipline, the training year for elite mountain bikers will typically consist of a pre-competitive and off-season, with the length of each phase dependent on the competitive schedule of individual athletes. For cross-country mountain bikers, the focus of the pre-season is to develop a large endurance base, which they will aim to maintain during the season. This will be achieved through a combination of cross-country and road riding. Elite downhill riders typically do the majority of their training on the trails. Increasingly, riders competing in both disciplines will incorporate some gym work to develop the specific strength and power characteristics required for the sport, especially during the pre-season.

### Competition

In Australia, riders will compete in the five race National Series which runs from November through February/early March. The Australian Championships are usually held in January, with the Oceania Championships being held in March. For elite level Australian cross country and downhill riders, the focus of their season is the World Cup series, which consists of six races held between April and September. They will also compete in other international events during this time in the lead up to the World Championships, which are held annually in August/September. Cross-country mountain biking has also been part of Olympic Games since 1996, and is also now an event at the Commonwealth Games. Some riders will be involved in professional teams, while others compete individually.

## Physical Characteristics

Elite cross country riders are generally lean and lightly muscled, especially in the upper body, with low total body mass. The low body fat levels seen in elite level riders assists in keeping their power-to-weight ratio high, which is especially important for hill climbing. Indeed, some studies have found elite cross country riders possess some of the highest relative power outputs during maximal aerobic exercise ever recorded. Downhill riders tend to be bigger and more muscular, as a result of their need to generate large power outputs when training and racing.

Common race formats for both cross country and downhill are described below.

### Cross Country

- Circuit** Competitors race on a circuit for a designated time period. The circuit must be at least 6 km and the race duration typically ranges from 1-2 hours depending on the level of riders. Twelve and 24-hour events are also popular, with riders competing solo or in teams of 2, 3, 4, 6 or 10.
- Point to Point** The course starts in one location and finishes in another. The course distance is usually between 25-100 km. The race may be conducted as a mass start or time trial format.
- Short Course** This event is similar to Circuit however each lap must be a maximum of 6 km.
- Enduro** This event takes place over one or more days and incorporates speed averages and special tests such as bike handling and mechanical skills.

### Downhill

- Downhill** Solo competitors race downhill over a distance of 1.5-3.5 km. A run typically takes 2-5 minutes to complete. Very little pedalling is required. The course is usually a mixture of rapid and technical sections and includes a mixture of single track, forest roads and rocky tracks.
- 4-Cross** A downhill event where 4 riders compete against each other and must pass through a series of gates. The course typically takes about 30-40 seconds to cover.
- Dual Slalom** Two riders race head to head down two parallel slalom courses. Conducted as a series of elimination races. Each run is typically 20-45 seconds.

### Other

- Observed Trials** A highly technical event where competitors must make their way around a series of obstacles. Points are deducted for mistakes in clearing sections.
- Hill Climb** A point to point course containing at least 80% of uphill riding.

## Common Nutrition Issues

This section focuses on nutrition issues faced by athletes training for and competing in Olympic cross country races, which typically last between 120-135 minutes for men and 105-120 minutes for women, unless otherwise stated.

### Meeting carbohydrate requirements for training

There is a paucity of data on the carbohydrate requirements and intakes of elite male and female cross country mountain bike riders. However, the long hours of training they undertake suggests they should target intakes similar to those recommended for other elite endurance athletes (7-12 g/kg body mass/day) to promote optimal performance and recovery. Achieving the higher end of this intake target, as would be required on harder training days, can be difficult. A useful strategy is to ensure nutrient-dense carbohydrate-rich foods are the main focus of each meal and snack, with additional carbohydrate choices being orientated in and around actual training sessions. For example, consuming carbohydrate-rich foods and fluids during long training rides e.g. sports drink, plain sandwiches, bananas, sports bars, gels, and having a snack that provides a good source of carbohydrate and protein soon after finishing e.g. low fat flavoured milk, creamed rice. Further, choosing more refined or low fibre food options, while taking advantage of carbohydrate-containing fluids such as juice or cordial, may also make it easier to achieve these high intake targets.

Assessment of the adequacy of carbohydrate intake is difficult. However, poor training performance, unnecessary fatigue, frequent illness, or failure to achieve expected outcomes from a specific training block may be indirect markers that the athlete's carbohydrate intake is inadequate.

### Body Fat Levels

The sheer volume of training undertaken by elite cross country mountain bikers means most will naturally "arrive" at a level of body fat that promotes high level performance. However, there are situations where additional effort is needed to help lower skinfolds e.g. after coming back from a break or in the lead up to an important competition. Where this is the case, riders should aim to limit or reduce intake of energy-dense foods and fluid, especially fat and alcohol. In addition, riders may wish to re-schedule training sessions so they finish around their normal meal and snack times, ameliorating the need for additional recovery snacks. They may also wish to undertake morning training sessions in a fasted state to promote greater mobilisation and utilisation of fat stores. Importantly, these riders should still ensure that they support quality sessions (interval or threshold sessions) by maximising carbohydrate availability before and/or during the ride. Further, to help minimise the extent of lean body mass loss associated with periods of energy deficit, riders should ensure adequate intake of protein at most meals and snacks.

While it is true that reducing body fat levels can help to improve mountain bike performance, it's important that reaching a certain skinfold target does not become the primary focus of the riders' preparation. To that end, close monitoring of training quality is paramount when the rider is undertaking a period of deliberate energy restriction. It is important to note that striving to maintain an unrealistic body fat level can have adverse implications on long-term health and psychological well-being.

## **Fueling and hydration strategies before and during rides**

The duration and intensity of Olympic cross country races dictate that riders need to employ strategies to maximise carbohydrate availability, as well as minimise the impact of dehydration on performance.

### **Before the race**

Carbohydrate intake targets for training, combined with light activity or rest in the 24-36 hours before racing, should be sufficient to fully stock carbohydrate (fuel) stores. During this time, athletes may wish to focus on more refined carbohydrate choices and carbohydrate-containing fluids, such as juice or sports drinks, to better promote sufficient intake and reduce the risk of gastrointestinal (GI) concerns during the race. To optimise hydration status, athletes should aim to slightly increase fluid intake in the 24-36 hours before the event, especially around meal times (See "Fluid-who needs it?" fact sheet for further information).

Foods and fluids consumed on the day of the race should be viewed as an opportunity to further top up fuel stores and promote optimal hydration. To that end, foods should be high in carbohydrate, as well as low in fat and fibre (See the "Eating before exercise" fact sheet for suggestions). Consuming drinks with food during this period is an effective way to enhance the retention of fluids and promote better hydration. Athletes involved in marathon cross country and multi-stage events would benefit from undertaking a carbohydrate loading diet in the 36-48 hours prior to the event (See the "Carbohydrate loading" fact sheet for more information)

### **During the race**

The practical difficulties associated with consuming foods and fluids while riding highlight the importance of the fuelling and hydration strategies undertaken beforehand. Furthermore, riders are often reluctant to carry too much with them due to the impact this may have on their power-to-weight ratio. That said, provision of carbohydrate during high intensity exercise longer than 90 minutes, such as Olympic cross country races, has the potential to further improve performance above providing water alone. During the event, riders are able to access feed stations, usually located on flat sections of the course, every 20-25 minutes. Given that most races are held in warm to hot conditions, where dehydration has the potential to negatively impact on performance, riders should aim to get most of their carbohydrate from fluids e.g. sports drink, flat coke. In more temperate or cool

conditions, they may wish to place a larger emphasis on more concentrated forms of carbohydrate, such as gels or even confectionary. Regardless of the strategy they use, it should always be practiced during harder training rides to assess tolerance and practicality.

*This fact sheet is based on AIS / National team athletes and is therefore specific to these athletes. Written by AIS Sports Nutrition, last updated December 2009. © Australian Sports Commission.*