

## NUTRITION FOR ROAD CYCLING

Road cycling involves both team and individual events. Races may be held over a number of stages or as single days. Other events include time trials (both team and individual) and criteriums (a race of varying number of laps around a circuit of roads). Races vary in distance from a few kilometres for some criteriums, to individual stages of 250 km or more. Road cycling primarily requires strength and endurance, although anaerobic capacity may be called upon in breakaways, hill climbing and all-out sprints to the line. Cycling is a sport that is heavily influenced by folk lore. It is common to hear of cyclists adopting quite bizarre nutrition practices based on anecdotal evidence and hearsay.

### Training

Road cyclists do most of their training on the road, and training distances vary with the time of the year. At the elite level, training involves at least daily sessions, with weekly distances tallying 400-1000 km. Wind-trainer sessions and weights may also be included. Even at the recreational level, cyclists often undertake a serious commitment to training. Distances of 300 km per week are common for a committed recreational rider.

### Competition

At the height of the elite season cyclists race almost daily, leaving little time for training. Serious recreational cyclists tend to race 1-2 times per week. Occasionally, 2-3 day tours are scheduled. Road cycling is physically and nutritionally challenging. Meeting fuel and fluid needs becomes increasingly difficult as the duration of races increases. Elite cycling is very technical and teams utilise a system of support vehicles and 'domestiques' to ferry food and fluid to team riders. At the recreational level, riders usually have to carry their own supplies from the start of the race.

### Physical Characteristics

Different physical characteristics make riders more suited to different aspects of cycling (e.g. sprinting, time-trialling, climbing). However, in general, cyclists are muscular and lean. Low body fat levels help keep the power-to-weight ratio high. This is particularly important for hill climbing.

## Common Nutrition Issues

### Training Nutrition

The long kilometres and hours of training undertaken by elite cyclists calls for a high-energy diet - high in protein, vitamins and minerals, and high in carbohydrate for muscle fuel stores. Adequate carbohydrate during prolonged exercise sessions is important to maintain a strong immune system and prevent riders breaking down mid-season. Daily recovery between heavy

training sessions requires a high total carbohydrate intake, but also clever timing of meals and snacks to enhance muscle glycogen restoration. Carbohydrate and other nutrients such as protein and vitamins immediately after a long training session will kick-start muscle glycogen synthesis and prepare fuel stores for the next training sessions, as well as promote other recovery processes.

A pattern of frequent meals and snacks may also be handy for making sure total energy and carbohydrate needs are met. With the amount of food required, it can be hard to rely on three meals a day. A dietary study of elite male cyclists estimated their average daily energy intake at over 26 000 kilojoules. This was only possible by a pattern of constant 'grazing' over the day.

Recreational cyclists also need a diet that is proportionally high in carbohydrate and sufficiently varied to provide enough protein, vitamins and minerals. Total needs are lower than elite cyclists and vary according to training loads. There is less reliance on snacks. Compare the following:

	<b>Elite Cyclist (600 km/wk)</b>	<b>Club Cyclist (300 km/wk)</b>
Kilojoules	> 250 kJ/kg/day	150-200 kJ/kg/day
Carbohydrate	8-11 g/kg/day	5-8 g/kg/day
Protein	1.2-1.6 g/kg/day	1-1.6 g/kg/day

## **Iron Status**

Iron status may be an issue, particularly for female cyclists. Often the desire to maintain low body fat levels can cause female cyclists to over restrict their intake and miss out on nutrients such as iron. Cyclists need to include sources of iron such as lean red meat, chicken, fish, green vegetables, wholegrain cereals and fortified products such as breakfast cereal regularly in the diet. Iron supplements should only be used when a blood test indicates an iron deficiency. Inappropriate use of iron supplements may weaken the immune system.

## **Body Fat Levels**

Most endurance cyclists take care of their body fat levels through heavy training. In some situations, particularly in the case of female athletes or athletes coming back from a break, there may be an additional effort needed to help lower skinfolds. Cyclists needing to lower skinfolds should target excess kilojoules from fat, alcohol, refined carbohydrate and other energy dense foods. It is important to maintain an adequate intake of nutrient- dense carbohydrate such as bread, cereals, fruit, vegetables and low-fat dairy products. Some cyclists fall into the habit of consuming large quantities of foods when in heavy training then fail to cut back when they are less active. Recreational cyclists can overestimate carbohydrate needs and consume too many products such as gels, sports drinks, bars and powders.

Some cyclists have unrealistic goals for body fat. It is true that reducing body fat can help to improve performance especially when hill climbing. Losing body fat may have little impact on cycling ability in the flats or when time-trialling and sprinting. It has been estimated that a loss of 5 kg would only improve time-trialling in the flats by 1%. Most recreational cyclists would not even notice this level of improvement. Striving to maintain an unrealistic body fat level can have adverse implications on long-term health and psychological well-being. Cyclists need to judge if the effort really is worthwhile.

## **Food and Fluid Needs during Long Rides**

Good performance during training and racing requires looking after fluid and carbohydrate needs. Moderate to severe dehydration will impair performance - this is obviously critical on race day but also a disadvantage to good training. Fluid needs will vary according to exercise intensity and environmental conditions. Fluid losses of approximately 300 ml/hr to 1200 ml/hr are reported in the literature but in some conditions, losses are expected to be much higher. Cyclists can estimate their own fluid losses by weighing themselves before and after riding. Each kilogram of weight loss is equivalent to one litre of fluid and shows the net deficit at the end of the session. The volume of any fluid consumed in the exercise session should be added to this deficit to estimate total fluid losses during the session. For example, a cyclist who finishes a session 1kg lighter and has consumed 750 ml of fluid has a total fluid loss of 1750 ml for the session, and has a remaining fluid deficit of 1000 ml (1 litre).

Depletion of body carbohydrate stores may cause heavy legs due to glycogen depletion of the quads or 'hunger flatting' due to reduced blood sugar levels. While some athletes are more affected by low blood sugar levels than others, all cyclists will benefit from preserving carbohydrate levels when training or racing.

Carbohydrate intake should be organised for rides over 1 hour in duration and fluid needs will vary both with the distance and the weather conditions. Be prepared and ensure you have access to sufficient supplies. Carbohydrate intake needs to start before you hit a hunger flat. Aim for about 30-60 g of carbohydrate per hour. Commence carbohydrate early in the race or training session to avoid low stores in the latter stages of the ride.

50 g Carbohydrate  
800-1000 ml sports drink  
2 carbohydrate gels  
3 medium pieces fruit  
2 cereal bars  
800 ml cordial  
500 ml juice  
50 g jellybeans or jelly lollies  
1 jam sandwich

On the bike, a range of solid and liquid forms of sustenance is possible. Sports drinks are a great choice - providing both carbohydrate and fluid. In hot conditions, when fluid needs

outstrip carbohydrate needs, you may require additional fluid such as water. Portable foods include bananas, dried fruit, sports bars, cereal bars and gels.

Good nutrition practices are just as important for training as competition. It is tempting to go on long training rides with only a single bidon of fluid and not want to interrupt your rhythm by stopping for refills. You can't expect to improve your training form without adequate fuel and fluid on board. You may be OK on the ride but spend the rest of the day tired, with a headache and unable to bounce back for the next training session. Try to keep your fluid deficit to as little as possible.

## **Competition Nutrition and the Pre-Event Meal**

The aim for all cyclists should be to start races with carbohydrate and fluid stores well stocked. In most situations, combining your usual carbohydrate intake with light training or rest 24-36 hours before racing will be sufficient to fully stock carbohydrate stores. In some situations, special strategies to carbohydrate load may be required (see next section). The pre-event meal is important for topping up stores and for keeping the stomach comfortable during the race. There are many suitable options for the pre-event meal. Use the following suggestions as a guide and experiment to find the best option for you:

- Have a normal-sized meal approximately four hours before the race and a snack one to two hours before the race.
- If your race is early in the morning, have a high carbohydrate meal the night before and a snack one to two hours before the race.
- Choose high-carbohydrate, low-fat foods to ensure easy digestion and to top up carbohydrate fuel supplies.
- Experiment with the type, timing and amount of food that works best for you.
- Include fluid with all pre-race meals and snacks. Drink regularly before the race to keep fluid levels topped up but don't overdo it or you will find yourself feeling uncomfortable or having to urinate. Consume approximately 300-400 ml of fluid immediately before the race begins. This helps to prime the stomach and improve gastric emptying during the race.
- If you suffer from pre-race nerves, try a liquid meal supplement such as PowerBar Protein Plus powder, Sustagen Sport or a fruit smoothie as a pre-race meal.

Pre-race meal ideas:

- breakfast cereal with skim milk and fruit + toast + juice
- muffins or crumpets + fruit + yoghurt + water
- pancakes + syrup + fruit
- baked potatoes with low fat filling + juice
- pasta with low fat sauce + juice/cordial
- rolls/sandwiches + fruit + yoghurt + water
- liquid meal (supplements or homemade fruit smoothies)

Pre-race snack ideas:

- cereal bar
- fruit
- yoghurt
- toast
- sports drink
- fruit bun
- sports bar

## Endurance Competition - Carbohydrate Loading

Carbohydrate loading is a method of eating which helps to optimise the amount of glycogen stored within the body. Carbohydrate loading requires an exercise taper combined with a very high carbohydrate intake. If your training schedule does not allow time for a taper before the race, you will need to place more emphasis on carbohydrate intake during the race. For very important races, it is worth reorganising training to allow for a longer race preparation and carbohydrate loading. (see the Carbohydrate loading Fact sheet)

## Multi-Stage Races - The Challenge of Recovery

Some cycling events require days of successive riding with individual stages around 200 km or longer. These events place enormous stress on the fuel and fluid reserves of athletes. Riders need to look after needs during each race and undertake strategies to assist recovery between days. Recovery of fuel stores is enhanced when a snack that provides carbohydrate and other nutrients such as protein and vitamins is consumed immediately after exercise. If there is more than an hour before your next meal you will need to choose from the following options:

<b>Male Athlete (Target 60-80 g carbohydrate)</b>	<b>Female Athlete (Target 40-50 g carbohydrate)</b>
200 g fruit yoghurt* + jam sandwich	200 g fruit yoghurt* + cereal bar
200 g fruit yoghurt* + cereal bar + 250 ml juice	200 ml flavoured milk* + cereal bar
200 ml flavoured milk* + cereal bar + banana	750 ml sports drink
750-1000 ml sports drink	200 g fruit yoghurt* + banana
sports bar* + 500 ml sports drink	sports bar*
200 ml liquid meal* + 1 large banana	200 ml liquid meal*

Note: \*indicates a valuable source of protein, vitamins and minerals in addition to carbohydrate

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