



Marathon Nutrition

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About Marathon Running

Running an endurance event such as the 42.2km marathon requires significant training and preparation to be mentally and physically ready for this grueling event. Nutrition plays a vital role in preparing one's body to complete this event; whether it's a first timer aiming to just cross the finish line or an experienced marathoner hoping to obtain a personal best (PB).

Training Diet

Marathon runners undertake intense training and require significant amounts of carbohydrate for energy, protein to maximize muscle strength, and sufficient fluids to maintain hydration.

Carbohydrate is the main source of energy for muscle contraction (stored as muscle and liver glycogen) and is an excellent fuel for exercise of long duration and high intensity.

For long training runs it is important to load up the muscle and liver with glycogen. Most runners require at least 5-7g carbohydrate/kg body weight/day. However this can increase to 7-12g/kg/day for longer training periods (10-15 hours per week). Eating such a large amount of carbohydrate every day can be challenging, so consider seeing an Accredited Sports Dietitian, who can assist you with some clever ideas. It is important to include carbohydrate-rich foods at all meals and snacks. Liquid carbohydrates (e.g. fruit smoothie with yoghurt/ice cream and sports drinks) are useful to keep carbohydrate levels topped up.

Many runners like to "carbo-load" leading up to a marathon. **Carbohydrate loading** allows you to super 'saturate' carbohydrates into working muscles. It won't make you run faster but it can help to delay fatigue during a race. During the taper week before the marathon, reduce training load significantly and increase carbohydrate intake to 7-10g/kg/day for three days before the marathon. During the carbo-loading period, expect a weight gain of 1-2kg due to the weight of extra glycogen stores and water. However, normal weight will resume once the marathon is over and while being lean is important for the marathon, this small amount of extra weight is well worth carrying!

Protein intake should be between 1.2-1.8g/kg/day. For example, a 60kg athlete would need to eat 72-108g of protein per day. Lean red meat, fish, chicken or vegetarian alternatives like tofu or legumes eaten at both lunch and dinner daily (lunch typically being a smaller serve than dinner), and three serves of dairy foods (or appropriate substitutes) per day will normally provide sufficient protein. Protein eaten together with carbohydrate can improve protein balance and absorption, and help with muscle repair and recovery (see the next page for examples of foods containing 50g carbohydrate and 10g protein).

Fluid needs

During a marathon, average sweat rates are anywhere between 0.5-1.5 litres of fluid every hour, and can be higher depending on individual sweat rates or if racing in hot or humid conditions. On any training day, drink enough fluids to allow for pale urine 5-6 times per day. It can be helpful to weigh yourself pre- and post-run to assess losses and, aim to replace 125 -150% of this loss. E.g. 1kg sweat lost = 1.25 - 1.5L to replace as soon as possible after exercise.

Maintaining hydration is critical for marathon running. A hydration strategy should be included in a nutrition plan and it is essential to practice drinking fluids during training. Dehydration places such a strain on the body and even very small fluid deficits (less than 2% of body mass) impair running performance. It is also useful to start drinking early during the race to minimise the risk of dehydration rather than trying to correct a fluid loss later. Sports drinks can be a convenient way to replace both fluid and carbohydrate losses during the race.

Sports drinks are also an excellent fluid source to help maintain / replace fluids and restore electrolyte balance. Sweat is made up of three electrolytes (sodium, chloride, potassium), with sodium lost in the greatest concentration. There is an abundance of sodium in food but when you are running a marathon (especially at high intensity in the heat and humidity) you may need extra sodium. Practising your hydration strategy for the marathon during training runs ensures you are comfortable with the fluids and volumes to drink, from both the physical and psychological perspectives.

What should I eat before an event?

The pre-event meal is like filling a car with petrol to get ready to go on a long journey; don't worry about focusing on long-term nutrition goals at this time. Eating before a race will help fuel muscle and liver glycogen stores to the maximum. It is important to eat something that is easy to digest and contains carbohydrate as well as fluid. Like fluids ingested when running, practice eating different pre-event meals before training runs to ascertain what works best for you. It is best not to try anything new on race day.

Many runners suffer from nerves and may find a liquid meal such a smoothie easier to tolerate. Ideally, the meal should be eaten one to two hours before the race to allow for food to be emptied from the stomach.

Some runners may also prefer to avoid fibre to prevent risking gastro-intestinal upset during the race. Cereal with milk, fruit and yoghurt, or an English muffin with jam/honey, are ideal pre-event meals to help boost glycogen stores. If you travel to compete, make sure you consider what food will be available before the event and plan to take your own meals if necessary.

Examples of foods containing 50g carbohydrate and 10g protein

- 250mL fruit smoothie
- 300mL flavoured low fat milk
- 1.5 Sports bars (Check labels)
- 1-2 cups cereal with 1 cup milk
- 1 sandwich with cheese / meat filling + 1 pc fruit
- 1 cup fruit salad with 200g low fat yoghurt
- 2 slices toast with small tin (125g) baked beans
- 2 crumpets / English muffins with either peanut butter or 2 slices cheese

What should I eat and drink during an event?

The role of nutrition during the race is to help prevent fatigue, prolong duration and intensity, and maintain hydration and electrolyte balance. During the marathon, most of the fuel comes from muscle and liver glycogen, which needs regular topping up. It is recommended to take in between 30-60g of carbohydrate per hour and even more if racing in heat, humidity and higher than usual intensities.

Consider practical foods that can be carried on one's body or made available at drink stations. Consider also small foods that can be eaten on the move. Popular choices include carbohydrate gels and sports drinks. Lollies, sports bars or even vegemite sandwiches are good options.

As with the pre-event meal, it is important to practice with different types of food and timing during the training runs to determine optimal individual preferences.

What about recovery?

The recovery meal should incorporate the three R's:

1. **REFUEL** muscle glycogen stores with carbohydrate
2. **REPAIR** muscles with protein
3. **REHYDRATE** with fluids and electrolytes

A marathon results in significant nutrition stress (loss of nutrients, fluid loss, muscle damage) and it is important to start the nutrition recovery process as soon as possible. A runner's appetite is often diminished at the end of a marathon so choose foods that are easy to tolerate such as liquid meal supplements or low fat flavoured milk. Make sure you have a snack ready at the end of the race to help kick start the recovery process. Muscles are most receptive to rebuilding glycogen within 30 minutes post event and they refuel at a faster rate if carbohydrate is ingested together with protein. Keep small practical foods handy (e.g. sports bar, fruit, low fat yoghurt) and aim to replace 125 - 150% of your estimated fluid loss.

Whilst it may be tempting to celebrate at the end of the race, keep in mind that alcohol can impair rehydration and recovery. Make sure you drink plenty of non-alcoholic fluids to rehydrate and choose foods containing carbohydrate and protein to recover before the celebrations begin.

Other Nutrition Tips

Vitamins and minerals are essential for keeping long distance runners healthy and active. With the high intake of additional kilojoules, carbohydrate, and protein, most distance runners will meet their additional needs for micronutrients.

However, pay attention to two key minerals.

Calcium is a key player in the bone remodeling process. The extra stress on bones in legs and feet causes the bone mineral to constantly dissolve and be replaced. Runners need to ensure they eat enough calcium-rich foods to maximize this process (e.g. dairy foods, fortified soy drinks / yoghurts, fish with bones, almonds) and take in enough Vitamin D to help the body absorb calcium. Long training runs during the day will help with Vitamin D absorption from sunlight. For more information, refer to the [Bone Health](#) fact sheet.

Long distance runners require up to 1.7 times more **iron** than a sedentary person. Intense running places stress on iron stores as iron is lost from "foot strike" (constant running on hard surfaces), sweat and urine. Female runners lose more iron through menstruation. Low iron stores are quite common in marathon runners and can lead to decreased immunity, elevated heart rate, low energy, and inability to train effectively. The best sources of iron come from animal protein; this iron is well absorbed by our bodies. Vegetarians need to take extra care to make sure iron requirements are met as most plant sources of iron (e.g. green leafy vegetables, wholegrains, and legumes) are not well absorbed. For more information see the fact sheet on [Iron Depletion in Athletes](#).

How do I get involved?

Buy a decent pair of runners, some active wear, and get going. A good way to maintain motivation and enjoyment in running is to join a club, or schedule training sessions with like-minded friends. Websites such as <http://www.starttofinish.com.au> and www.coolrunnings.com.au list upcoming events, along with plenty of interesting information and tips for improving running performance.

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