# Module Two

## Hacking Your Before and After

# FUELLING PEAK PERFORMANCE Workbook

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# Hacking Your Before & After

*Pre and Post Exercise Nutrition*

## Outcomes

- ★ Possess the tools and strategies to plan your food and fluid intake before, during and after training
- ★ Have the knowledge to calculate the amount of carbohydrate, protein and fluid you require to perform at your best
- ★ Discover the nitty gritty of how to use these nutrients to your advantage

## Fuelling the body for sport and exercise

### 1. Before

All exercise and muscular work requires the expenditure of stored energy and there are several energy sources available to the muscles.

Eating a meal or snack before exercise will give you the opportunity to top up your glycogen stores in the muscles and liver and therefore the energy to workout harder and longer. In an ideal world, a meal should be consumed 3-4 hours before exercise and a snack 1-2 hours before exercise. However, this is not always possible – particularly for early morning sessions.

Your body does need time to digest and absorb the food before your training session starts. You don't want your digestive system busy during your training session when your body needs to be focusing on delivering energy to your muscles.

The pre-exercise meal or snack should provide carbohydrate, which is the key fuel source for muscles during exercise. Beginning a training session with no fuel and low carbohydrate stores will inevitably lead to fatigue and reduced endurance, intensity and stamina.

The amount of carbohydrate should be specific to your level of activity and overall energy needs. The energy cost of an activity such as running, swimming or cycling is directly proportional to the speed and distance travelled. For activities where the body weight needs to be supported, body weight is also an important factor, which explains the emphasis on low body fat levels in marathon runners.

Foods eaten before exercise should contain carbohydrate, be low in fat and contain moderate amounts of fibre to make digestion easier and to avoid stomach upset. Fluid is also an important factor in preparing for a training session.

## Pre-training meal ideas (if 3-4 hours before)

- ★ Fruit toast with ricotta and banana
- ★ Baked potato with corn and cheese
- ★ Baked beans or spaghetti on toast
- ★ Breakfast cereal with milk
- ★ Sandwich with meat and salad filling
- ★ Fruit salad or berries with yoghurt
- ★ Pasta or rice with a low fat sauce
- ★ Pita bread wrap with tuna and salad

## Pre-training snack (if 1-2 hours before)

- ★ Fresh fruit
- ★ Canned fruit
- ★ Tub of yoghurt
- ★ Cereal/muesli bar
- ★ Flavoured milk
- ★ Fruit bun or fruit scone
- ★ Up and Go or similar drink
- ★ Toast with jam/peanut butter/Vegemite
- ★ Breakfast cereal with milk/yoghurt

## What if appetite is a problem?

For some people eating before a training session can be a problem due to discomfort or lack of appetite. Training your stomach to accept food is similar to training your muscles to work hard, it takes time and effort. Liquid meals can be a great starting point as they are easily digested and not too bulky. Try liquid meals such as low fat milkshakes, fruit smoothies or flavoured milk products.

### What about early morning training?

It's dark outside and you are rolling reluctantly out of bed for an early morning training session. Your entire body is still in sleep mode and that includes your stomach. Eating at this point in the day can sometimes seem so difficult and it's a real struggle to get anything at all down. It is inevitable that some of the timing rules that we just talked about go straight out the window, because there is simply not the ideal 1-2 or 3-4 hours available before exercise. It is still very important that you have something to eat because while you have been asleep, it's possible that you have lost around two-thirds of your energy stores (carbohydrate) just through sleeping. If eating seems an impossible task, organise your snack the night before, start small and work your way up. The payoff will be worth it.

If you don't eat a pre-exercise snack, you are basically asking your body to perform without petrol and it is never a winning combination. You won't know how good you can feel until you have tried it.

## 2. After

During low intensity exercise, most of the energy demand is met by the breakdown of fat (which is why we tell individuals who want to lose body fat to exercise longer at moderate intensity rather than short and hard).

As the exercise intensity increases, the total energy demand increases and the contribution of carbohydrate increases (especially muscle glycogen). Carbohydrate is stored in the muscles and liver as GLYCOGEN.

At high intensity efforts virtually all the energy demand is met from carbohydrate with no contribution of fat. Glycogen is available immediately within the muscle cells whereas fatty acids and glucose from the liver have to be transported from the liver into the bloodstream. Small amounts of fat are stored within the muscles but these do not make a major contribution to energy production.

If muscle and liver glycogen stores are at full capacity (i.e. you have eaten enough carbohydrate), the stores will last for approx. 90 minutes depending on several factors including whether you are female or male, your muscle mass and injury.

Then there are factors that determine the rate at which the body's limited carbohydrate stores are used during exercise.

Glycogen utilisation during exercise depends on:

- ★ Exercise intensity
- ★ Exercise duration
- ★ Training status

The higher the intensity of the exercise the faster the glycogen is used and at very low exercise intensity, the muscle glycogen falls very slowly. At high exercise intensities, fatigue is reached before all the muscle glycogen is used, when fatigue is reached after 1.5 - 2 hours, muscle glycogen is close to zero.

If you are training for longer than an hour, you will need to replenish your glycogen stores. It is essential that carbohydrate intake begins well before the first signs of fatigue are apparent. What type of food and fluid you use will depend on the logistics of your activity.

If you are a swimmer, it is difficult to consume food but possible to drink sports drink, which will provide you with carbohydrate and electrolytes.

Cycling allows you to eat more solid food whilst running for longer than an hour really only allows for carbohydrate gels and sports drink.

Activities like running can be super tricky with taking food and fluids on board.

Sometimes it can seem like a major hassle to carry fuel belts and bottles but the benefits in performance far outweigh the initial logistical problems.

The amount of carbohydrate required during training is as follows:

| Exercise | Length of time | Carbohydrate |
|---|---|---|
| Brief exercise | < 45 min | not required |
| Sustained high intensity exercise | 45 - 75 min | small amounts (including mouth rinse) |
| Endurance exercise | 2+ hrs | 30 - 60g/hr |
| Ultra-endurance exercise (glucose/fructose mix) | 4+ hrs | Up to 90g/hr |

### Foods containing 25-30g of carbohydrate include:

- ★ 1 carbohydrate gel
- ★ 1 large banana
- ★ 2 slices of bread with jam or Vegemite
- ★ 400ml sports drink
- ★ 1 muesli bar or ½ sports/energy bar
- ★ ½ packet of carbohydrate ‘chews’ or lollies
- ★ 25-30g lollies
- ★ 4 dates

**Don't forget!** If carbohydrate is consumed without enough water, you may suffer from side effects such as stomach upset, abdominal pain and dehydration. This will ultimately lead to poor performance and in some cases, inability to finish a training session or race. Aim to consume around a cup (250ml) of water per 30-60g of carbohydrate.

## Protein and Caffeine

Research has shown that there is no need for protein during training, although it is important in recovery.

Other research has shown that consuming caffeine before an exercise session may have a glycogen sparing effect (i.e. it gets saved) through using more fat as fuel but this requires more investigation. A cup of coffee is not harmful before an early morning training session and may in fact wake you up!

## 3. Recovery

A common complaint of athletes is fatigue and inability to recover. Quite often this is a result of poor recovery practices and insufficient carbohydrate. It is super important to replenish carbohydrate stores immediately after a training session or competition. Timing is everything and ideally should be within 15-30 minutes of finishing the session. It is very easy to waste time after training talking to friends, teammates, gathering belongings or just generally milling around. Keep an eye on your watch or set the timer to remind you. Aim for 50g carbohydrate plus approximately 15g protein within the 15-30 minute window and then follow-up with something more substantial.

After intense exercise the recovery of glycogen is a relatively slow process and normally takes approximately 24 hours. If adequate dietary carbohydrate is not consumed following exercise, recovery can take up to 7-10 days.

Many athletes train every day and if the diet does not contain adequate carbohydrate the muscle glycogen will not recover between training sessions.

Protein is also very useful and essential for recovery – sports nutrition experts (like my colleagues and I) recommend 10-20g of protein alongside the 50g carbohydrate.

Some barriers to recovery after exercise are:

- ★ Limited time before next training session
- ★ Limited availability of high carbohydrate foods
- ★ Lack of appetite after training
- ★ Restricted energy intake to control body weight
- ★ Presence of muscle damage

There are a number of characteristics that are important to look at when choosing recovery foods:

- ★ Presence of other valuable nutrients; it is important that the majority of carbohydrate foods chosen in an athletes diet are nutrient-rich, that is they should supply some protein, vitamins and minerals.
- ★ Bulky or compact; the bulkiness of many of the more nutrient-rich foods is often a limiting factor for athletes to achieve the carbohydrate intake they need. Compact carbohydrate sources such as sugar and high-sugar foods, including jam, honey and confectionery as well as carbohydrate-containing drinks may provide a practical solution to getting enough carbohydrate.
- ★ Appeal and palatability.
- ★ Glycaemic index – remember that carbohydrates used to be classified as simple and complex based on speed of digestion. It was assumed that 'simple' carbs were digested quickly (lollies, soft drink, cordial, honey etc) and 'complex' carbs were digested slowly (breads, cereal, rice and pasta, fruit and vegetables). Carbohydrates do not fit neatly into these categories and research has shown that they are classified as low, medium or high glycemic index (GI) based on their effect on blood sugar levels.

  After training, high GI carbohydrates will be more quickly absorbed but if they are not available, any will do.

## 50g carbohydrate portions

- ★ 600-800ml sports drink
- ★ 800ml cordial
- ★ 500ml juice or non-cola soft drink
- ★ 50-60g jelly beans or jelly lollies
- ★ 1.5 carbohydrate gels
- ★ 1 round thick jam or honey sandwiches (2 slices of bread)
- ★ 2 muesli bars
- ★ 2 large pancakes
- ★ Bowl of pasta
- ★ 1 cup of creamed rice

### 10-20g protein plus carbohydrate

- ★ 600ml low fat flavoured milk
- ★ 4 heaped tablespoons skim milk powder plus 250ml low fat milk
- ★ 1 x Go Natural Protein Bar
- ★ 2 eggs + 2 slices of wholegrain toast
- ★ 1 x tin tuna + 4 rice cakes

If the timing is right and a meal is naturally placed after you finish training (within 15-30 minutes) then you may not need to have the extra snacks we have talked about but if not, there is definitely the need for a 'transition' snack.

What you eat and drink before, during and after training/competition is vital to your continued energy management and performance. Consistency and organisation are vital.

## Your tasks for this week are:

- ★ Start tracking what you are doing before, during and after training sessions – are you managing your time and nutrients?
- ★ What are the barriers to doing this?

**Obstacles are those frightful things you see when you take your eyes off your goal**

**- Henry Ford, Founder Ford Motor Co**