

# Module Four The Icing on the Cake FUELLING PEAK PERFORMANCE Workbook

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## The Icing on the Cake

*Hydration for Peak Performance + Performance Enhancing Minerals, Calcium, Iron and Competition Preparation* 

#### Outcomes

- ★ Understand the importance of hydration and the role of various fluids including caffeine, sports drinks and energy drinks
- ★ Establish how to meet your calcium and iron needs
- ★ Know how to prepare for a competition or event

## **Hydration**

Many people do not consume enough fluid day-to-day or during exercise. This problem is amplified in the cooler months as we don't feel like drinking cool fluids and tend to consume more tea and coffee. Caffeine containing beverages such as tea, coffee and cola drinks do act as diuretics to varying degrees and can promote the loss of fluid, although this is often minimal.

Thirst is not a good indicator of your fluid needs. It can be difficult to estimate fluid losses when there is no proof of sweat e.g. sitting in an air-conditioned office.

Taking enough fluid on board is one of the most effective ways of enhancing your daily performance. Fluids are lost in sweat and how much you sweat will depend on your size, temperature on the day, clothing you are wearing, and whether you are exercising. Sweat rates vary a lot but when sweat loss is not matched by fluid intake, dehydration will occur.

So how does dehydration affect your daily performance?

- ★ Decrease in physical and mental performance
- ★ Inability to make a decision
- $\star$  Loss of coordination

In short, you feel exhausted, lifting your feet becomes an impossible feat, you can't make decisions (good ones at least) and you get a headache!

If you lose more than 2% of your body weight through fluid loss, the health risks become more serious and can result in nausea, vomiting, diarrhoea and other gastrointestinal problems. And no, you can't toughen up or train your body to handle being dehydrated.

## **Fluids in training**

We know that staying hydrated is key to your general performance but what are some good fluid tips while training?

- ★ Begin your exercise session hydrated and drink well before you start.
- ★ Drink at regular intervals, around every 15 minutes and try to consume between 150-250 ml's each time. You could set your watch timer at 15-minute intervals to remind yourself to drink.
- ★ If exercising for less than 60 minutes, water is the most practical and economical fluid. Cool water is better absorbed and is more refreshing and palatable.
- ★ Fluid recovery is essential and you can check your fluid loss by monitoring your weight before and after training. The difference between the two is your fluid loss and you should aim to replace 150% of this loss over the next 2-6 hours. So, if you lost 1 kg in weight you will need to drink 1500 ml to fully rehydrate.
- ★ Practice your race day fluid plan during training.

## Sports drinks, electrolyte drinks and energy drinks

Sports drinks can be useful performance-enhancing tools when exercising. Electrolytes such as sodium (salt) are lost in sweat and need to be replaced during and after prolonged exercise. Sodium improves fluid intake as it stimulates thirst and promotes carbohydrate and fluid uptake. Sports drinks contain electrolytes like sodium, carbohydrates and water, making it a complete package. These drinks are most effective for exercise sessions one hour or longer in duration.

Electrolyte drinks contain no or little sugar and can be useful in hot weather when additional carbohydrate is not required but electrolytes such as sodium, potassium and magnesium are. Some well known products include Hydralyte, Aqualyte and Carboshotz Electrolyte tabs.

'Energy drinks' should not be confused with common 'Sports' drinks such as Gatorade, Powerade and others, which were originally developed for athletes.

Energy drinks such as Red Bull, V, Lift Plus and Mother have flooded the market in the last few years and primarily appeal to weekend athletes, children and teenagers. They contain a wide range of ingredients including sugar, caffeine and/or guarana, B-group vitamins, amino acids and herbal products. Sugar is the main carbohydrate and energy source, and it's concentration is often 11-15%. This level of carbohydrate is similar to cordials and soft drinks but significantly higher than sports drinks. The high sugar concentration can slow your stomach emptying and affect fluid absorption. There is little scientific evidence to prove the addition of amino acids (such as taurine) or herbal ingredients (like ginseng) to energy drinks are beneficial.

The main ingredient of interest in energy drinks for most people is caffeine. Caffeine is a stimulant that affects the brain, nervous system, heart, kidneys, muscles and lungs. Despite marketing claims to the contrary, guarana contains caffeine and acts in exactly the same way.

Energy drinks are not a good choice for fluid replacement before, during or after sport and should not replace sports drinks or water.

#### **The Performance Enhancers**

## 1. Caffeine

This topic has become hot over the past few years mostly due to athletes using it for performance enhancing purposes. Caffeine was a banned substance for many years until almost 20 years ago in the year 2000, when it was delisted under IOC regulations. It has gained huge popularity amongst the general public since then.

Some of you may have been wondering whether caffeine will help you get through your day. Caffeine is a stimulant that speeds up parts of the body and the brain and can enhance your performance if used properly.

It is hard not to notice that our coffee culture is thriving. I can remember the first time I wandered into a Starbucks store, where the options were many and varied. While I was waiting to order I overheard someone ask for a 'Venti (extra large) pumpkin spiced chai latte, no froth with low fat milk'. My latte seemed very boring in comparison!

The fastest growing beverage in the world right now is the very popular 'Energy drink.'

A few years ago when energy drinks were gaining popularity I noticed a report in the West Australian newspaper, which indicated that they might be attracting an entirely new target group. Armed robbers.

"A youths heavy consumption of the energy drink Red Bull could explain (but not excuse) in part why he robbed a supermarket at knifepoint, a judge said yesterday. The court was told that before the robbery the youth was drinking up to 11 cans of Red Bull per day which would put him in a state of caffeine intoxication leading to impaired judgement and delirium"

Eleven cans of Red Bull contain 880 mg. Although there is no recommended intake, most authorities agree that the safe daily upper limit for caffeine is around 300mg for the average adult person. 300mg is equivalent to 3-4 cups of brewed coffee (cappuccino, latte, flat white etc). There is no safe limit for children.

It has been proposed that caffeine can promote the increased use of fat as an energy source during exercise and therefore spare carbohydrate (glycogen) stores, however, further research is required in this area.

### **Caffeine Counter**

		Caffeine (mg)
Brewed coffee	1 cup	85 - 120
Instant coffee	1 cup	60
Brewed tea	1 cup	75
Instant tea	1 cup	30 - 50
Green tea	1 cup	50 - 80
Cocoa powder	2 tsp	20
Milo	2 tsp	1
Energy drink	250ml	80
Milk chocolate	30g	6
Cola drink	375ml can	40
Caffeine table (No Doz)	1 cup	100

Technically, caffeine is a diuretic but this does not necessarily mean that it will make you urinate excessively. For example; a 200ml cup of tea containing 50mg of caffeine will produce 60ml of urine with the resulting 140ml being part if your fluid intake.

### 2.Pumping Iron

Iron deficiency is a condition in which the number of red blood cells or their capacity to carry oxygen is limited resulting in tiredness and fatigue, breathlessness, poor working ability and minor skin and nail changes. It can occur in men and women. Iron deficiency can be a problem for many athletes of any level

	Mg iron / day
Men	7 mg
Women (19 - 54 years)	12 - 16 mg
Women (54 +)	5 - 7 mg
Pregnancy (Trimester 2 & 3)	22 - 36 mg

Dietary iron can be difficult to obtain and is found in two different forms - 'haem' iron which is found in animal foods and 'non-haem' which is found in non-animal food.

'Haem' foods usually contain more iron, which is well absorbed compared to non-haem iron, which is not well absorbed. Foods containing non-haem iron can also contain other substances, which make the iron unavailable to your body. These include tannin (in tea), phytates (in wheat bran and breakfast cereals) and oxalates (in spinach). The consumption of Vitamin C at the same meal enhances the iron absorption of these foods.

Therefore, if your diet is based mainly on vegetables you may find your iron intake to be low and also unavailable. With planning and consistency this can be resolved.

#### Iron content of some common foods

Haem Iron Foods

Food	Serve	mg Iron
Liver	100g (cooked weight)	11.0
Liver pate	40g (2 tbsp)	2 - 3
Lean steak	100g (cooked weight)	4.0
Chicken (dark meat)	100g (cooked weight)	1.2
Fish	100g (cooked weight)	0.6 - 1.4
Oysters	1 dozen	4.7
Salmon	100g (small tin)	1.4

Non-haem foods

Food	Serve	mg Iron
Eggs	100g (2)	2.0
Breakfast cereal (fortified)	30g (1 cup)	2.5
Wholemeal bread	60g (2 slices)	1.4
Spinach (cooked)	90g (2/3 cup)	3.6
Lentils / kidney beans (cooked)	100g	2.5
Tofu	100g	1.9
Almonds	50g	2.1
Sultanas	50g	0.9
Dried apricots	50g	2.0

### The role of red meat

The role of meat in the diet in recent times has been controversial. In 2002 the International Agency for Research on Cancer published a meta-analysis on the relationship between meat consumption and colorectal cancer. Total fresh meat appeared to be unrelated to the risk of colorectal cancer. The increase in relative risk for colorectal cancer associated with increased consumption of processed meats appeared substantial.

#### **Possible Mechanisms**

- Flame: Polyaromatic hydrocarbons are produced when meat is cooked directly over a fire or grill on a BBQ. These compounds are common in the diet and are found in cereals, oils and fats.
- High heat: Formation of heterocyclic amines when meats are subjected to high heat e.g. Pan-frying
- Curing: Nitrite compounds may be generated during the preservation of some meat such as ham, bacon, salami etc.

It is advisable to avoid char-grilling, less high temperature cooking of meat, more roasting, stewing and microwaving and limit intake of processed meats.

## **3. Calcium**

Dairy products are the foundation for your bones and keep your nerves and muscles firing.

Clinical studies have shown that those people with higher intakes of calcium and dairy foods also have lower body weight and less body fat. These protein foods are more satisfying and keep you fuller for longer.

It is true that dairy products are not the only sources of calcium. Calcium can be found in many other foods besides milk, cheese and yoghurt. The question is, are you prepared to eat 45 tablespoons of sesame seeds to obtain the same amount of calcium that you will find in 250 ml of milk?

People often ask me if they can use sesame seeds, green leafy vegetables or nuts as an alternate calcium source to dairy products. This table gives an indication of the quantities of some common foods that contain the same amount of calcium as 250ml of milk.

## Compare the amount of non-dairy food that needs to be consumed to be equivalent to one serve of dairy.

Food	Quantity
Almonds	120g
Apples	7.5kg
Apricots, dried	430g
Baked beans	900g
Bread, wholemeal	20 slices
Broccoli	1kg
Eggs, boiled	18
Salmon, canned with bones	140g
Sesame seeds	45 tbsp
Spinach	600g

The other factor to consider is that the calcium in dairy foods is absorbed more efficiently than from other sources. This means that although you might be feeling REALLY hungry and manage to munch your way through 7.5 kg of apples, you still won't absorb the same amount of calcium found in 1 cup of milk.

Most people will be able to obtain their average daily requirement of calcium by eating three serves of dairy every day. One serve of dairy is equal to:

- ★ 1 glass (250ml) of milk
- $\star$  1 tub (200g) of yoghurt
- ★ 2 slices (40g) of cheese

Delving into the nitty gritty of these micro's can make all the difference with maximising your energy and well-being.

## **Competition Nutrition**

Preparing for a competition or an event can bring a number of things with it. Anxiety, nervousness and anticipation are a given but what about preparing the body with food? It is now the time to put into practice everything that has been trialled in training. Let me say that again, 'everything that has been trialled in training'. This is a key aspect of a successful competition, EVERYTHING that is consumed must be practiced and trialled in training. Nobody wants a surprise when competing. It can get VERY messy.

#### Carbohydrate Loading

- ★ Discuss the background of carb loading
- ★ Only appropriate for events lasting 90 minutes or longer
- ★ Elevates glycogen levels and this extra supply of carbohydrate has been demonstrated to improve endurance exercise by allowing athletes to exercise at their optimal pace for a longer time. It is estimated that carb loading can improve performance over a set distance by 2-3%
- ★ 1 4 days of exercise taper while following a high carbohydrate diet (7-12g/kg bwt) is enough to elevate muscle glycogen levels
- $\star$  Don't leave the preparation till the night before
- ★ Possibly not as effective for females

There is good evidence to show that an inadequate intake of carbohydrate in the days prior to competition will significantly reduce exercise performance, even in sprint events and games. If the event is shorter than 90 minutes, carbohydrate loading is not necessary but it is still crucial that a diet with enough carbohydrate and protein is eaten to provide the

energy to compete. Now is not the time to eat everything in sight and an eye should be kept on calorie intake and the consumption of fatty foods.

The night before an event should be all about a pasta or rice based meal with some lean meat, chicken or fish plus vegetables or salad on the side. Go for the tomato based sauces rather than the rich, heavy, fat laden cream based variety. Don't forget to keep sipping on the water too.

#### **The Pre-Event Meal**

The pre-event meal needs to be low in fat and should contain approximately 100-150g of carbohydrate. Timing, amount and type of food will depend on individual preferences and needs of the sport. Experimenting is important (but only in training not on competition day). If there are issues with anxiety and gastrointestinal upset, a liquid meal might be preferable as discussed previously.

It is really important to eat breakfast/brunch on the day of an event if it is later in the day (this may be the pre-event meal) and some good choices for this meal includes:

- ★ Cereal without bran (Weetbix, porridge, natural muesli, Mini-wheats) with low fat milk and fresh/canned/frozen fruit
- ★ Toast, fruit loaf, English muffins or crumpets with baked beans, spaghetti, tomato or egg or plain jam, honey or Vegemite
- ★ Pancakes with fresh fruit and syrup
- ★ Fresh or tinned fruit (forget the prunes) and yoghurt
- ★ Up and Go or Sustagen Sport with a banana

Remember from our discussions last week that just like training sessions, if the event or competition will last longer than an hour, glycogen stores will need to be replenished during the event.

It is essential that carbohydrate intake begins well before the first signs of fatigue are apparent. What type of food and fluid is used will depend on the logistics of the activity. For swimmer's, it is difficult to consume food but possible to drink sports drink, which will provide carbohydrate and electrolytes. Cycling allows more solid food whilst running really only allows for carbohydrate gels and sports drink.

The amount of carbohydrate required during competition (you may recall it's the same in 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/Vegemite
- ★ 400ml sports drink
- ★ 1 muesli bar or ½ sports/energy bar

#### **Don't forget Water**

If carbohydrate is consumed without enough water, side effects such as stomach upset, abdominal pain and dehydration are likely. 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 carbohydrate.

3 - 4 hours	Crumpets with jam or honey + flavoured milk
	Baked potato + cottage cheese filling + glass of milk
	Baked beans on toast
	Breakfast cereal with milk
	Bread roll with cheese/meat filling + banana
	Fruit salad with fruit-flavoured yoghurt
	Pasta or rice with a sauce based on low-fat ingredients (e.g. tomato, vegetables, lean meat)

1 - 2 hours	Liquid meal supplement
	Milk shake or fruit smoothie
	Sports bars (check labels for carbohydrate and protein content)
	Breakfast cereal with milk
	Cereal bars
	Fruit-flavoured yoghurt
	Fruit

Less than 1 hour*	Sports drink
	Carbohydrate gel
	Cordial
	Sports bars
	Jelly Iollies

#### **Preparing for Tournaments and Multiple Heat Competitions**

Tournaments and multi-heat competitions can be very challenging from a sports nutrition perspective. I often see junior athletes at pool, court and trackside getting stuck into hot chips, large jelly snakes, buckets of lollies and anything else they can get their hands on in between events, games or races! Often what they have just loaded up with is fat and super quick acting sugar which won't last until the next event but will certainly either make them sick or push them to fatigue. This can be vastly improved with the right information and prior planning and organisation.

## Sample Tournament and Multiple Meet Competition Plan

Time	Event	Advice
7:00am	Breakfast	Cereal + low fat milk + slice of toast with jam
9:00am	Warm up and race 50 m freestyle heats	Drink at least 1 cup of water in the half hour before race
10:00am	Break	Yoghurt / banana + water or sports drink
11:00am	Warm up and race 50 m backstroke	
11:30am	Recovery, warm up and race 50 m freestyle final	Remember fluids – water or sports drink
12:00pm	Lunch	Vegemite / ham sandwich + tinned fruit
1:30pm	Warm up and race 100 m medley	Remember fluids – water or sports drink
3:00pm	Break	Muesli bar + sports drink
4:00pm	Warm up and race 4X50 m freestyle relay	Remember fluids between races.
4:30pm	Recovery, warm up and race 4X50 m medley relay	Don't forget fluid replacement after racing. Sports drinks will help to replenish carbohydrate until you get home for dinner
6:00pm	Dinner	Chilli chicken + rice (from Survival of the Fittest Cookbook)

## Conclusion

The McDonalds path vs. Live a Long Time route can be applied to all aspects of your health

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Cheap	Digestible
Accessible	Longer lasting
Easy	Requires thought
Fast	Requires effort
No need to think	Gives you an edge

#### How are you getting there?

I love being a passenger in the car and switching off, passing all responsibility onto the driver, particularly on long trips when I can just look out the window and admire the scenery. Anyone else love to do that?

With your health, well-being and performance, you need to be the driver.

AVOID Paralysis by Analysis. We are very susceptible to this phenomenon as there is SO much information and options around now. The end result is usually no action.

Motivation is not permanent and maximising your performance is a daily practice.

But what we really want to avoid is getting discouraged (which may have happened many times before) and following the windy, tortuous route that costs us money, time, effort.

Don't let today be the end of the fork in the road - if you need help and support going forward, please be in touch via email or Facebook.

Thanks so much for being part of 'Fuelling Peak Performance'.

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## There are no shortcuts to any place worth going - Beverly Sills, Opera Singer

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## Resources

- ★ http://juliemeek.com.au/newsletter/news-august13.html
- http://www.ausport.gov.au/ais/nutrition/factsheets/competition\_and\_training/ nutritional\_preparation\_for\_tournaments\_and\_multiple\_heat\_competitions
- ★ https://www.sportaus.gov.au/ais/nutrition/recipes