

Nutritional Advice for Athletes

Nutrition is an important element in any performance, but specifically for athletes due to the amount of energy that they expend. Careful consideration should therefore be given to nutrition before, during and after training and competitions.

Nutritional components

Nutritional components include what we eat and what we drink:

- ✓ **Carbohydrates** are the most important source of fuel and therefore provide our key energy source. Carbohydrates are divided into two types:
 - **Complex** – found in starchy foods; bread, pasta, rice, potatoes, breakfast cereals, bagels, beans and lentils etc.
 - **Simple** – found in processed and refined foods such as sugar, sweets, fruit, soft drinks, cakes, biscuits and chocolate.
 Complex carbohydrates are digested and stored within the body to provide a constant source of energy whereas simple carbohydrates cause an energy 'high' which quickly is converted to a 'low' as the body releases a chemical called **insulin** to counteract the effects of the simple carbohydrates.
 Simple carbohydrates should therefore be **avoided immediately prior to training or competition**, but may be necessary **after** training or competitions to allow an athlete who has used up some of their energy stores to take in enough carbohydrates so that their body can refuel and repair effectively. More about this later!!

- ✓ **Fat** also provides a source of energy, but the body takes much longer to make it into energy in comparison to carbohydrates. The body needs a certain amount of fat and especially unsaturated fats which are found in sunflower, soya, corn and olive oil as well as all oily fish. Some vitamins are fat soluble, for example vitamins A and D.

- ✓ **Protein** is required for the successful repair of muscles. However, many athletes eat too much protein in the belief that it is the key to improved performances. Excess protein cannot be stored and is therefore converted by the body and stored as unwanted fat.
 Proteins are found in white and red meat, eggs, yogurts, nuts, milk, cheese, fish, beans and quorn.

- ✓ **Fibre** is necessary to aid healthy digestion and is found in all wholemeal products such as brown rice and pasta, porridge, beans, vegetables and some fruit.
 Athletes, especially those involved in longer endurance events who need a high carbohydrate diet need to be cautious about taking in too much fibre at the same time as an over-active bowel may play havoc with your performance!

- ✓ **Vitamins** and **minerals** do not provide energy, but are required to maintain general health. It is not necessary to take vitamins as supplements as a regular intake of **five** portions of fruit and vegetables (5 handfuls), will ensure an adequate intake of vitamins and also contribute to an athlete's carbohydrate intake.
 Remember that vegetables can come in fresh, frozen or tinned varieties so most athletes will be able to find some that they like.
 Minerals which are of particular importance are iron found in liver, kidney and oily fish, and calcium found in all dairy products.

- ✓ **Fluid intake** is essential to maintain the body's hydration levels. People's normal fluid intake per day should be 1.5-2 litres, but for performing athletes this will be higher due to dehydration during training and competitions. Also remember that it does not have to be warm for you to become dehydrated! The key to hydration is not to wait until you are thirsty – by this point you will already be dehydrated and as little as 2% dehydration can lead to a 20% impairment in performance.

Proportions - Size matters!!

For athletes the nutritional components in your diet should be made up slightly differently from that of someone who does not train, but just wants to stay healthy. Have a look at the comparison below:

Parts of your diet	Health	Sport
Carbohydrates	47%	60-70%
Fat	33-35%	20-30%
Protein	11-15%	11-15%

Barriers

There are many things that can get in the way of a healthy diet for an athlete:

- ✓ Peer pressure – fruit and vegetables may not be cool
- ✓ Time – school, training and work commitments
- ✓ Travel – to training and competitions places an extra pressure on fitting in the correct nutritional intake
- ✓ Eating habits – of family and friends



Remember, however, that without healthy eating, performance won't happen.

Why do you get fatigued?

Fatigue during athletics is caused when the energy you have used is higher than the energy available in the body. This is mainly caused by running out of glycogen stores which are supplied by the intake of carbohydrates. The muscles then try to burn fat to make more energy, but this is not a quick fix and the muscles then try to 'pinch' glucose from the blood which can lead to a low blood sugar (hypoglycaemia). The feeling of fatigue for you as an athlete



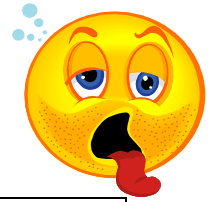
Updated 03.04.08

Written by Sophie J Dunnett

may be when the muscles start to feel weak and heavy and you may feel light-headed and dizzy.

Why do you get dehydrated?

Most people function dehydrated most of the time. For athletes the key to success is to start all training/competitions well hydrated and to maintain your levels of hydration during and after training/competitions. The feeling for you as an athlete of dehydration may be feeling light-headed, weak or feeling sick.



So let's look at how healthy your daily diet is!!

Try keeping this diary and consider how you could improve your nutritional intake.

Day	Meal	Carbohyd.	Protein	Fat	Fluid	Improvements?
Monday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Day	Meal	Carbohyd.	Protein	Fat	Fluid	Improvements?
Tuesday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Wednesday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Thursday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Day	Meal	Carbohyd.	Protein	Fat	Fluid	Improvements?
Friday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Saturday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					
Sunday	Breakfast					
	Snack					
	Lunch					
	Snack					
	Dinner					

Strategies for good nutrition

So what are the strategies you can use for training/competing to improve your performance?

The main strategy is that if you want to improve your nutritional intake so as to improve your performance, it must be a **life change** and not just a change for the 24 hours before a big competition. We have already outlined what change will benefit you within athletics and for your general health.

However what you do before, during and after training and competitions will give you the edge over your fellow competitors if you follow some basic guidelines.

Before training/competition

- ✓ Make sure you are taking in enough carbohydrates to provide the required level of energy (I will tell you how to work this out later)
- ✓ Eat a main meal 3-4 hours prior to training/competition if possible. If not then eat a high carbohydrate snack 1-2 hours before training/competition.
- ✓ Prior to training/competition drink as large a volume of fluid as possible; this should be up to 500mls, but you will need to practise this!!

During training/competition

- ✓ Maintain your fluid intake by drinking whenever possible (up to 100-500mls every 15mins) depending on the athletic discipline you are doing and other factors such as heat. This again will require some practice as it may not come naturally but remember to practice during training and not during an important competition.
- ✓ During longer training of over 1-1½ hours, during an endurance competition of over 40mins or between heats/semi's/finals, try taking in some carbohydrates through fluids or through small amounts of solid foods which are high in carbohydrates. This is a good time to use simple carbohydrates to good effect – try a handful of raisins, a couple of jaffa cakes or half a dozen fruit pastilles or jelly babies.

After training/competition

- ✓ The amount of carbohydrate requirement is 1g/1kg weight, so for a 50kg person, that could be 750-1,000mls isotonic sports drink, 500ml fruit juice, 2 medium bananas, 1 sports bar or 2 cereal bars, jam sandwich, 5 jaffa cakes, lean meat or tuna sandwich or salad sandwich plus fruit. Lots to choose from!! This should be taken in the first 20-30 min. after training/competition and should include a small amount of protein if it was a hard session. Again simple carbohydrates can be used as a stop gap after training/competition if there is going to be a delay in good nutritional intake but this must not be instead of proper nutritional intake of complex carbohydrates and protein.
- ✓ For rehydration after a long endurance session you should aim to drink about 1,000mls of fluid within the first hour after training/competition. You should then check your urine colour and continue to drink until your urine is a pale straw colour (remember, however, that some medications can make your urine a darker colour than normal).

Carbohydrate calculator

To calculate the grams of carbohydrate/day that you require, you will need to know your body weight in kilograms and the level of training/physical activity that you do per day. This should relate to the amount of active training/competition and not the time spent at training/competition. To work out your level of training/physical activity, add the hours for a whole week together and then divide by 7 to give you an average. Find the average number of hours on the following table:



Level of training hours per day	Light (less than 1 hour)	Moderate (1-2 hours)	Heavy (more than 3 hours)
Grams of carbohydrate per day	4-5	6-7	8-10

Then follow this calculation:

$$\begin{array}{ccccccc}
 \text{Weight (kg)} & \times & \text{Level of training} & = & \text{Carbohydrate requirement per day (g)} \\
 \boxed{50\text{kg}} & \boxed{\times} & \boxed{4-5 \text{ (Moderate)}} & \boxed{=} & \boxed{200-250\text{g of carbohydrate per day}}
 \end{array}$$

E.g.

This is your carbohydrate range

Protein calculator

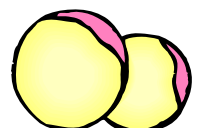
Remember we said that your protein intake was not as important as your carbohydrate intake. However, if you want to calculate your protein intake you will need to decide if you are a **strength, speed** or **endurance** athlete and then use the table below:



Average Protein requirement	
Type of training	Grams(g) Protein/Kg body weight/day
Strength athlete	1.4 - 1.7
Speed athlete	1.4 - 1.7
Endurance athlete	1.2 - 1.4

Fat calculator

Updated 03.04.08
Written by Sophie J Dunnett



Fat Cells

To calculate fat intake, you need to start from your total energy daily intake which for women is 2000kcal and for men 2500kcal. Your total fat intake should be between 20 – 30% of this.

E.g. Women: 20 – 30% of 2000 = 400 – 600 kcal, which is 45-65grams of fat/day (because 1g fat = 9kcal)

Men: 20 – 30% of 2500 = 500 – 750kcal, which is 55 – 83grams of fat/day (because 1g fat = 9kcal)

Types of fluids

There are different types of fluids and good ones don't always have to come with blue food colouring in them or have to live in fancy bottles that cost a lot of money!! Each of the types of fluid performs a different function:



	Carbohydrates in grams/100ml	Fluid or fuel replacement	When?
Hypotonic	2-3	Fluid	Before, during or after especially when warm conditions where hydration is an important factor
Isotonic	5-8	Fluid and fuel	Before, during and after without affecting hydration
Hypertonic	>10	Fuel	After but not during as it can lead to dehydration

The reason why hydration is so important for athletes is that as little as a 1% lose in body weight, can lead to a 10% reduction in athletic performance; that's losing ½ kg in a 50kg athlete during training or competition. So get into the habit of **good hydration** and start by having a look at the labels of drinks in supermarkets to decide which of your favourite drinks are hypotonic, isotonic and hypertonic.

Alternatively you can make your own –

Type of drink	Suggested recipe
Hypotonic	Fruit squash diluted 1 part squash to 4-5 parts water with 1/5th tsp salt per litre. Fruit juice diluted 1 part juice to 3 parts water with 1/5th tsp salt per litre.
Isotonic	60g glucose dissolved in 1litre of water or diluted sugar free squash with 1/5th tsp salt per litre. 500mls pure fruit juice added to 500mls water with 1/5th tsp salt per litre.
Hypertonic	60-100g glucose polymer dissolved in 1litre of water or diluted sugar free squash with 1/5th tsp salt per litre.

Rehydration is calculated on weight changes during training/competitions

During hard/long training sessions or competitions, you should look to replace lost kgs of body weight with fluid intake as any weight lost during this time will be due to fluid loss from sweating as opposed to burning body fat.

To calculate this, you need to weigh yourself in kgs before **and** after training/competition and then multiply any lost kgs by 1.5 to calculate the number of litres of fluid you need to replace.

E.g. Weight before Weight after Weight change x 1.5 = Volume
 52kg 51kg 1kg 1.5litres of fluid

Planning ahead

Because so much training and competition can involve planning your nutrition around training times and travelling arrangements, it is useful to carry some snacks in your kit bag that you can dip into if and when required.

Some suggestions are:

- Fruit:** Fresh fruit (bananas, apples, oranges)
Dried fruit (apricots, sultanas, raisins)
Cartons of fruit juice
- Cereals:** Cereal bars (Nutrigrain, Special K bars, Geobars)
Breakfast cereals
Sandwiches, bread rolls, tortilla wraps, bagels
Fruit bread, malt loaf, fruit scones, sultana pancakes,

teacakes

- Cracker type biscuits
- Biscuits:** Oatcakes, Jaffa cakes, fig rolls, reduced fat digestives, ginger nuts
- Crisps:** Low fat crisps, Snack a Jacks, Thai Bites, Walker Lites, Quavers, Wotsits, popcorn
- Sweets:** Jelly Beans, Jelly Babies, Fruit gums/pastilles



References:

The National Coaching Foundation (2005) *Fuelling Performers Coachwise 1st4sport*: Leeds
Home study pack

Updated 03.04.08
Written by Sophie J Dunnett