Fact Sheet 1
JUNE 1998

# Fluids in sport

## . . . an overview

- Start the session well hydrated. Make sure that you've replaced fluid losses from your last exercise session, and be aware of your fluid needs in hot weather.
- Have a drink 10-15 minutes before the start of your sport or workout. This drink will help to replace the first beads of sweat.
- Don't rely on visible sweat as a guide to your fluid needs. Some athletes can't see their sweat losses e.g. swimmers who are already wet, or cyclists whose skin is quickly dried as they speed through the air.
- Check out your sweat losses during training or sport. Weight loss over an exercise session is almost entirely due to loss of fluid - not body fat (see *Estimating your sweat loss* on this page). Use the information to plan your rehydration after the session or to plan better fluid intake practices during future sessions. Make every effort to keep weight changes to less than 1 kg during any workout or sports event.
- Make sure your plan takes advantage of the fluid intake opportunities presented in your sport or exercise activity. Make drinks available for these occasions (see *Practical tips for drinking* next page), and try to keep them cool and refreshing.
- Aim to drink early in the session, and then at regular intervals. Most people can learn to drink about 600-1000 mL per hour. For example, drink 150-250 mL every 15 minutes. Train yourself to drink to your plan.
- Ideally, your fluid intake plan should replace about 80% of your sweat losses. However, in hot conditions it may be impossible to keep pace with high rates of sweating. Do the best that you can.
- After exercise, rehydrate quickly as part of your recovery plan. You will need to drink plenty of fluid to cover the present fluid deficit and ongoing sweat and urine losses. If you know how much fluid you have lost, plan to drink an extra 50% over the next couple of hours (e.g. 1.5 litre if you lost 1.0 kg or 1.0 litre) to put you back into fluid balance. Choose a recovery plan based on fluids and high carbohydrate snacks.
- Alcohol interferes with rehydration and other recovery processes. If you choose to drink alcohol, look after recovery needs first and then enjoy alcohol in sensible amounts (maximum four standard drinks for men and two for women).

## Estimating your sweat loss

There's a simple way to check your sweat losses, and how well you replace these during training sessions or events.

Weigh yourself before and after the session. If possible, weigh yourself naked or in minimal clothing, making sure that you have towelled yourself dry. Use accurate scales.

- Your weight change over the session reflects your accumulated fluid deficit - in other words the difference between sweat losses and your fluid intake over the session. Try to keep this below 1 kg. (1kg = litre of fluid)
- Some people prefer to express this fluid deficit or dehydration as a percentage of their initial weight. Aim to keep this well under 2%. To do the sums:

  % dehydration =

  $$\frac{100 \times (\text{pre-exercise wt (kg)} - \text{post-exercise wt (kg)})}{\text{pre-exercise weight (kg)}}$$

- You can estimate your total sweat loss by adjusting your weight loss over the session to account for the fluid that you consumed:

  Total sweat loss (mL) =

  1000 x (pre-exercise wt (kg) – post-exercise wt (kg))
  \+ mL of fluid consumed (mL)
  \+ solid food consumed
  ---
  Total sweat loss (mL)

- Knowing your approximate sweat rate can help you to develop a personalised drinks plan.

## Did you know?

- Thirst is not a good guide to dehydration. Most people feel thirsty only after a significant fluid deficit has occurred. And when they drink, they usually feel satisfied and stop, well before fluid losses have been fully replaced.
- Sweat rates vary between people - even people exercising side by side. In general, however, sweat rates increase with the intensity of exercise, and in a hot, humid exercise environment. Aerobic training and acclimatisation to a hot climate both help an athlete to sweat earlier and at higher rates during exercise. Being able to sweat enables your body to get rid of the heat that your muscles produce during exercise.
- Athletes who undertake high intensity exercise in hot conditions can lose 2-3 litres of sweat each hour! Typically, though, most exercisers can expect to lose around a litre of sweat per hour.
- Children and the elderly have lower sweat rates, and are therefore less able to regulate their body temperature when they are hot.

Sports Dietitians

This is a sports nutrition publication of Sports Dietitians Australia. Phone (03) 9682 2442 Fax (03) 9686 2352 Email SDA@ausport.gov.au

# Is water the best drink?

Until recently, most sports scientists felt that the benefits of extra fuel intake during exercise were confined to endurance sports or exercise lasting longer than 90 minutes. Water was considered the best drink for most sports or exercise situations. In fact, earlier research made us think that carbohydrate drinks such as sports drinks were 'too concentrated' for use during exercise. But new information to hand should make us rethink our position.

Recent scientific studies show that carbohydrate intake during sport can improve performance during high intensity exercise of only one hour, and intermittent exercise such as in team sports. Sports drinks (e.g. Gatorade) have been scientifically proven to provide the correct balance of carbohydrate and fluid to improve performance in these types of activities.

Even if you do not need the extra fuel, you tend to drink more when you like the taste of the drink, and do a better job with your fluid balance. Water has the advantage of being free (usually) and being widely available. And it is definitely the best option if you want to pour it over your head to cool yourself down, or give your sunglasses or mouthguard a quick wash.

However, it is likely that a carbohydrate boost during exercise is valuable in more situations than we previously realised. Try experimenting to see if your sports events or work-outs benefit from the extra fuel.

# Dehydration: the ugly facts

Some athletes think that dehydration only becomes a problem when a certain level of fluid deficit is reached. Or because they don't collapse or get 'wobbly' during exercise that the ill-effects of dehydration were avoided. These are the facts:

- The effects of dehydration increase as the level of fluid deficit increases. With every level of dehydration there is an increase in your heart rate, body temperature and the perception of how hard the work or exercise feels. Sports performance is reduced before the athlete notices that their performance is beginning to fade.
- Studies show that dehydration of less than 2% fluid deficit is sufficient to cause a definite decrease in performance.
- The effects of dehydration are most noticeable when exercise is undertaken in a hot, humid environment.
- Dehydration reduces mental functioning and skill co-ordination. Therefore, dehydration will have an extra impact on sports involving skill and decision making.
- High levels of dehydration (> 3-4% of body weight loss) increase the risk of nausea, vomiting, diarrhea and other gastro-intestinal problems during exercise. Dehydration slows the rate at which you absorb fluids. In other words, as you dehydrate it becomes extremely difficult to reverse the fluid deficit. In fact, you may end up feeling sick and bloated if you drink fluid too late.
- High levels of dehydration may increase the risk of heat stress.
- It is **impossible** to 'train' or 'toughen' your body to handle dehydration. Don't bother trying!

# Practical tips for drinking

Scientific studies show that athletes typically only replace about half of their sweat losses during sport or exercise. It may not be possible to achieve full fluid replacement during all activities, but there is room for most of us to drink more fluid and reap the rewards of better hydration!

Sports and exercise activities are all different. Look for every opportunity to drink:

- In most team and racquet sports there are formal breaks between quarters or halves of the match, at the end of games/sets or at the change of ends. Players should use these times to grab a drink. It helps to have your own drink bottle handy.
- Substitutions and time outs also offer a drink break for players. There may be random stops in play e.g. rule or injury stops. In some sports, trainers can take advantage of these 'quiet' times to run a drink bottle out to players. Make the most of these opportunities, especially in warm to hot weather.
- At training sessions, make your own stops in play to take time out for a drink. Work on a schedule rather than waiting until you feel tired or thirsty.
- In sports such as running, cycling, skiing and triathlons, the athlete must drink on the move. The downside includes having to slow down to grab a drink and risking stomach upsets from too much fluid. On the positive side, better hydration will mean better performance. Clever athletes will practice these skills to get maximum benefit for minimum fuss. Some runners use special squeeze bottles for easy drinking, and triathletes/cyclists carry drink pouches with a straw attached for hands-free and aero-dynamic fluid intake. Find creative ways to solve the problems in your sport.
- Many athletes train or compete in wide open spaces, away from taps and shops, or aid stations. Make plans to be able to carry some fluid supplies with you e.g. have drink cages on your bike, or carry packs or bottles in pockets and back packs. If you can't carry all the drink you need, arrange for a 'handler' to bring you a top-up, or plant your own supplies out on the route before you start.
- Encourage yourself to drink by choosing cool fluids that taste great.