

## Hydration strategies

No other dietary strategies enjoy the reputation of proven performance enhancers as do the consumption of water and carbohydrate during exercise. Players can turn this science into optimal performance and well-being by learning the practical aspects of: a) how much, b) what type of foods and drinks, c) when during exercise, and d) what modifications should be made in hot or cold environments. Just as general training and competition strategies should be tailored for individual athletes in accordance with their unique needs and preferences, so should their drinking and eating choices during exercise. Players, coaches and trainers should 'fine tune' these recommendations to identify their own winning formula.

### How much and when to drink?

Limit dehydration during training and matches by drinking water or a sports drink. Obvious opportunities to drink during a match include warm-up and at half time. During training, the coach or manager should organise drink breaks according to the weather and intensity of exercise.

Get a feel for sweat rates during exercise so that drink practices can be adjusted accordingly (see box). It is not necessary to drink enough to prevent loss of body weight, but the amount of dehydration should normally be limited to a loss of less than 2% of body weight (ie, 1.0 kg for 50 kg person, 1.5 kg for a 75 kg person, and 2 kg for a 100 kg person).

Since the negative effects of dehydration on high-intensity performance are greater in warm environments, upgrade drinking practices in these conditions to minimise the overall fluid deficit. This may include drinking at the side-line when match play is interrupted, or having extra drink breaks during training sessions.



Don't drink at rates that are greater than sweat losses so that you actually gain weight during exercise.

### When do you need more than water?

Depletion of fuel stores can be an issue for soccer matches, especially for players in mobile positions or with a running game style. High carbohydrate strategies – fuelling up for the game and consuming extra carbohydrate during the match – have been shown to enhance performance in such players.

Better match intake of fluid and fuel may not only keep players running further and faster in the second half of a match, but may help to maintain skills and judgement when players would otherwise become fatigued. Games are often won and lost in the last minutes of the match, and fatigued players are at increased risk of injury.

The use of commercial sports drinks with a carbohydrate content of about 4-8% (4-8 g/100 ml) allows carbohydrate and fluid needs to be met simultaneously in most events. The intake of carbohydrate that is generally associated with performance benefits is ~ 20-60 g per hour.

Sodium should be included in fluids consumed during exercise lasting longer than 1-2 hours or by individuals during any event that stimulates heavy sodium loss (i.e., more than 3-4 grams of sodium).

Caffeine is present in many commonly available beverages and foods, and can enhance endurance during prolonged exercise. This benefit can be obtained with the relatively small doses of caffeine that are commonly consumed by people of various cultures (e.g. about 1.5 mg/kg bodyweight as found in a small cup of brewed coffee or 500-750 ml of a cola beverage).

### How to estimate sweating rate

Measure body weight (kg) both before and after at least one hour of exercise under conditions similar to competition or a hard practice.

Measure body weight wearing minimal clothing and while bare footed. Dry with a towel after exercise and obtain body weight as soon as is practical after exercise (e.g. less than 10 min).

Note volume of fluid consumed during exercise (Litres)

Sweat loss (litres) = Body weight before exercise (kg) – Body weight after exercise (kg) + fluid consumed during exercise (litre)

To convert to a sweat rate per hour, divide by the exercise time in minutes and multiply by 60

**Note:** 2.2 pounds equals 1.0 kg and converts to a volume of 1.0 litre or 1,000 ml or 34 ounces of water.

### Rehydration after exercise

Recovery after exercise is part of the preparation for the next exercise session, and replacement of sweat losses is an essential part of this process. Both water and salts lost in sweat must be replaced. Aim to drink about 1.2-1.5 litres of fluid for each kg of weight lost in training or matches. Drinks should contain sodium (the main salt lost in sweat) if no food is eaten at this time. Sports drinks that contain electrolytes are helpful, but many foods can also supply the salt that is needed. A little extra salt may be added to meals when sweat losses are high, but salt tablets should be used with caution.

**Just like new boots, don't try out new plans for fluid and fuel intake during important competitions. Do it in practice and find out what fits you best.**

