



**FOOTBALL
FEDERATION
VICTORIA**

Football Federation Victoria
2009 State Squads
Sports Science Handbook

Hydration

Regular drinking of fluids is essential in order to maintain sporting performance. Athletes can lose as much as 1 to 2.5 kilograms of body mass during a soccer match under normal conditions and 4 kilograms during hot and humid conditions due to sweat loss. Fluid intake of athletes is usually less than the amount that is lost during a training session or match. Athletes should not rely on being thirsty to drink fluids because by this time you are already dehydrated. A decline in body mass of 2 percent significantly affects your performance, decreases concentration, and decreases skill levels. Drinks should be cool, palatable (taste good/flavoured), and contain sodium. Sports drinks are an ideal drink in this situation.

Athletes should weigh themselves both before and after a training session or match to monitor their fluid loss. For every kilogram of body mass lost, the athlete should drink 1.5 litres of fluid. For example if you lose 1kg of body mass you need to consume 1.5 litres of fluid (preferably a sports drink).

Evening Before Competition

On the evening before a competition it is recommended that athletes undertake some sort of hydration strategy to ensure that they are fully hydrated for the match the next day. The following strategy was developed by the Victorian Institute of Sport.

- Drink 1 to 1.5L of Sports Drink over a 1½-2 hour period, beginning at least 3 hours before the athlete goes to bed
- Peak urine output should occur 2-3 hours later, allowing the excess fluid to be excreted prior to going to sleep

For example if you're planning to go to sleep at 10pm begin drinking the sports drink at 6pm and finish drinking it by 7:30pm. Peak urine output should occur between 8pm and 9pm. Bedtime will then occur at 10pm. This will allow the athlete to have an uninterrupted nights sleep and wake up hydrated the next morning.

Water, juice, cordial, and soft drink should not be used as a substitute for the sports drink in this hydration protocol.

Match Preparation

- 2 hours before a training session or match, consume at least 300 ml to 500 ml of water or sports drink.
- During a training session or match consume approximately 200 ml every 20 minutes of sports drink.
- It is recommended that bottles filled with sports drink be left near the sideline or on the bench. This allows players to have easy access to their bottles and helps to remind players to keep hydrating.
- Half time should be used to steadily sip on a sports drink to refuel and optimise performance in the second half.
- If only plain water is available, do not over-drink

Post-match Rehydration

After post-match body mass has been recorded, the amount of fluid to be consumed can be calculated.

For every kilogram of body mass lost, 1.5L of fluid should be consumed.

This fluid should be consumed within a couple of hours of the end of the game or training session. The best fluid for rehydration is a sports drink.

References:

- Department of Sports Nutrition, AIS. (2004).
www.ais.org.au/nutrition/FactFluid.pdf
- Sports Science Department, VIS

Nutrition

Athletes need a high carbohydrate intake on a daily basis. Carbohydrates are stored in the muscles and the liver as glycogen and are probably the most important fuel source for energy production. Insufficient stores of carbohydrates may cause an athlete to become fatigued towards the end of a training session or match resulting in a reduction in performance and skill level. On average athletes will require between 5-8 grams of carbohydrate per kilogram of body weight each day. Therefore carbohydrate rich foods like breads, breakfast cereals, fruit, vegetables, rice, pasta, yoghurt, and low fat flavoured milk need to be the focus of meals and snacks.

Match Preparation

Athletes should ideally consume a normal size meal 4 hours before a match. This can be followed by a snack 1-2 hours before the match. If the match is early in the morning you can choose to have a high carbohydrate meal the night before and a high-GI snack 1-2 hours before the match. Choose high carbohydrate low fat foods to ensure easy digestion and to top up carbohydrate stores. Experiment with the type, timing and amount of food to work out what works best for you. Drink plenty of fluids before the match. If you're feeling too nervous to eat before a match try to have something like a fruit smoothie.

Pre-Match Meal Ideas (4 hours before a match)

- Pasta or rice with a sauce based on low fat ingredients (e.g. tomato, vegetables, lean meat) and a glass of juice
- Stir fry with rice or noodles and vegetables
- Rolls or sandwiches with cheese/meat/salad fillings and some fruit
- Pita Bread with salad/meat fillings
- Baked potato with low fat filling and juice or a glass of milk and yoghurt
- Breakfast cereal with skim milk, some fruit, toast and juice
- Muffins and some fruit and yoghurt
- Crumpets with jam or honey and a glass of flavoured milk
- Pancakes with syrup and some fruit
- Baked beans on toast

Pre-Match Foods (1-2 hours before a match)

- Home-made, low-fat fruit smoothies (banana, mango, berries)
- Breakfast cereal or toast with low fat milk
- Cereal bars, muesli bars
- Fruit flavoured yoghurt
- Fresh fruit

Pre Match Snacks (Less than 1 hour before a match)

- Sports Drink
- Jelly/Tube lollies

During the Match

Soccer matches place a high demand on carbohydrate stores. If possible try to consume some carbohydrates during half time. Don't forget this is an important time for fluid consumption.

During match food ideas

- Sports Drink (Gatorade or Powerade)
- Jelly/Tube lollies
- Fruit e.g. Banana

Post-Match

It can take up to 20 hours to fully replace an empty energy tank but the first 30 minutes post match is the most effective period for the recovery of fuel stores. Players should ideally aim to consume 50-100 grams of carbohydrate within 30 minutes of finishing training or a match. Consuming protein post-match is important for the repair of damaged muscle tissue and to speed up recovery.

Post-match snack ideas

- Sports Drinks
- Rolls or sandwiches with meat, cheese and salad fillings.
- Jam/Honey sandwiches
- Pita Bread
- Fruit or a fruit salad
- Breakfast bars or sports bars
- Toast
- Scones
- An Iced fruit bun
- Flavoured low-fat Yoghurt
- Fruit Juice
- Fruit smoothie
- Sustagen

The post match meal needs to increase sodium intake as this assists rehydration. This can be achieved by adding salt or by consuming high salt meals such as chicken soup or risotto.

References:

- Department of Sports Nutrition, AIS. (2004)
www.ais.org.au/nutrition/documents/FactCHO.pdf
- FIFA Nutrition for Football pamphlet (2005)
www.fifa.com/documents/fifa/medical/FIFA_COCA_Lay10_EN.pdf
- Sports Science Department , VIS

Recovery

Recovery sessions are necessary for all athletes to undertake after training sessions and games to ensure the promotion and acceleration of regenerative processes of the body. Correct recovery techniques can speed up adaptation to training, improve performance and prevent overtraining and injuries.

Warm Up

A warm up should be undertaken before every match and training session. It should consist of:

- Aerobic Activity
- Passive Stretching to a set routine
- Dynamic Stretching to a set routine
- A Ball Session/Skills Session

Active Recovery

After a match, training session, or a substitution players should undertake an active recovery. An active recovery is suggested as it removes lactate from the blood more quickly compared to passive recovery, it facilitates a smoother decline in body temperature, it helps to dampen nervous system activity promoting sleep, and it can also benefit the immune system as an abrupt drop in body temperature can increase the likelihood of minor infections.

An active recovery can consist of:

- Jogging for 5 minutes
- Light stretching of all major muscle groups

Pool Recovery Session

A pool recovery session can either be undertaken after a match or training session in place of an active recovery or it can be conducted the following morning. The water provides buoyancy and resistance properties that allow the athlete to undertake exercises and stretching with minimal stress placed on the joints. Athletes should be hydrated before the session begins and must have a drink bottle close to them on the side of the pool. Drinks should be consumed regularly throughout the session.

The pool recovery session may include (in waist-deep water):

- Slow walking
- Stretching Passive Stretching to a set routine
- Light Jogging
- Moving the limbs through their entire range of movement

Contrast Therapy

Contrast therapy is a useful recovery tool because it has a flushing effect and promotes blood flow and oxygen delivery to the muscles. The application of a cold shower or cold-water immersion promotes vasoconstriction (constriction of blood vessels), which aids in reducing swelling and inflammation. The application of a hot shower or hot water immersion (e.g. a spa) promotes vasodilation (dilation of blood vessels), which increases blood flow allowing an increase in the amount of oxygen and antibodies going to the muscle.

Contrast Therapy should be undertaken as soon as possible after the active recovery (preferably within 30 minutes of finishing).

The following is a typical protocol for contrast showers:

- 2 minutes in warm water
- 30 seconds in cold water
- Repeat three times

Drink bottles should be close to players at all times for hydration purposes. Avoid using heat if the player is injured - ice therapy should be used.

Massage

In the case of injury, there is to be no massage on the site of trauma. Each athlete can massage themselves, particularly their legs, for approximately 10 minutes. Self-massage is a form of biofeedback allowing athletes to tune into how their body is responding to training. Massage can be used to relax the body and could be useful before going to sleep. Fluids should be consumed throughout massage.

Sleep

A good night's sleep allows the body to adapt to stresses acquired through training and normal daily activities. It is recommended that an athlete receive 7 to 9 hours of sleep. However this may not be enough especially if athletes are undertaking very high intensity training sessions or are going through a growth spurt. In this case 10 hours of sleep may be required. Too much sleep, however, can make an athlete feel slow and lethargic. Therefore try and find a balance. A pre-sleep routine can help an athlete to relax and get to sleep. Strategies that can be undertaken before sleeping include listening to music, reading, meditation, or even drinking a warm glass of milk.

References:

- Calder A. (2003) Recovery Strategies for Sports Performance. *Olympic Coach* 15(3): 8-11
- Cochrane, D. (2004) Alternating Hot and Cold Water Immersion for Athlete Recovery: a review. *Physical Therapy in Sport* 5: 26-32
- Reilly, T., Ekblom, B. (2005) The Use of Recovery Methods Post-Exercise. *Journal of Sports Sciences* 23(6): 619-627

Tips for Travelling

Many people arrive at the airport already tired and weary because it is an early flight or they have left things - like packing - until the last minute. Having plans and being organised prior to travelling will help to reduce stress levels and ensure that you, your parents, and the team are well rested.

Things to take with you on the plane:

- At least 1 drink bottle of sports drink or water to prevent dehydration. The humidity on a plane is 10-15%, which means that moisture is literally drawn away from your body
- A sandwich/roll for lunch or a snack because often airports don't have healthy food available.
- Some healthy snacks (e.g. breakfast bars, dried fruit, mixed nuts, fruit, rice crackers)
- Something to entertain you like a book, magazine, ipod, cards etc.

On the Plane

- Drink 300-400ml of fluid (water, sports drink, juice) every hour to prevent dehydration.
- Avoid soft drinks, coffee and tea.
- Do some stretches in your seat and walk around to prevent stiffness and fatigue (without disrupting other people).

Reference:

- Warr, CR. "The travelling athlete – minimising adverse effects".