



[www.BokSmart.com](http://www.BokSmart.com)



## Rugby Nutrition:

### Fluids

Fluids play a significant role in optimizing rugby performance <sup>[1,2]</sup>:

- ✓ It maintains adequate hydration
- ✓ It helps regulate body temperature
- ✓ It can also be a practical and important source of nutrients such as carbohydrate and electrolytes (and protein if needed)
- ✓ It helps fight infections by increasing the production of saliva, which has anti-microbial properties

### What is optimal hydration?

Provided that you are not using any supplements, you can simply look at the colour of your urine to show you how well hydrated or poorly hydrated you are. Your urine will be a pale straw colour if you are properly hydrated; but the more dehydrated you are, the darker the colour of the urine.

**Both dehydration (hypohydration) and over-hydration, can negatively impact on performance. So avoid the following situations:**

- Being dehydrated (>2%) and thirsty (this is more likely in warm to hot conditions).
- Being overly-aggressive with fluid replacement strategies especially in cooler weather (this can lead to a potentially fatal condition called hyponatraemia – which incidentally is not because of the consumption of low sodium fluids, but is a result of simply drinking too much) <sup>[3]</sup>



### Signs and Symptoms of dehydration <sup>[1,3]</sup>:

Early signs of **dehydration** are headache, fatigue, decrease in body weight, loss of appetite, flushed skin, heat intolerance, light headedness, dry mouth and eyes, and dark urine with a strong odour. Advanced signs require urgent medical intervention and include difficulty in swallowing, clumsiness, shrivelled skin, sunken eyes and dim vision, painful urination, numb skin, muscle spasms, “abnormal behaviour”, and delirium.

### Signs and symptoms of overhydration: <sup>[1,3]</sup>

Signs of **over-hydration** include: an increase in body weight, bloating and swollen hands, legs, and feet, nausea, vomiting, extreme fatigue, respiratory distress, dizziness, confusion and disorientation. In severe cases, hyponatraemia (severe lowering of sodium levels in the body) can lead to seizures, coma and even death if left untreated.

### Can fluid intake prevent heat stroke? <sup>[1,3]</sup>

If the rate of heat production by the body exceeds the rate of heat loss, total body temperature may rise to a level that causes heat illness and heat stroke. Drinking more will not necessarily prevent this dangerous situation (i.e. organ dysfunction and collapse) from occurring as there are many other contributing external and internal factors. External factors include ambient temperature; radiant heat (direct sunlight); humidity; wind; exposure time; clothing (e.g. dark clothing), headgear, and medication, and stimulants such as pseudoephedrine and caffeine. Internal factors include a past history of heat intolerance; body size and composition; aerobic fitness; acclimatization; pre- and during- exercise hydration levels; and viral illness, e.g. upper respiratory tract infection or gastroenteritis.

It is therefore recommended that players are closely monitored and individually assessed on a daily basis, when exercising in a hot environment. Any player demonstrating signs or symptoms of heat stress should be removed **immediately** from training or playing.

### How much fluid before and during training and a match? <sup>[1]</sup>

This varies between different players and will depend on your body weight, work rate and sweat rate. Dehydration also affects individual players differently. You therefore need to **develop your own fluid plan, taking into account your different needs between training and matches and adjusting for different environmental conditions.**

For example, you may require less fluid in a resistance/gym session compared to an aerobic session or a match in hot humid conditions.

- ✓ Start games and training adequately hydrated and utilize opportunities like stoppages/half time to drink sufficient fluid. Continue to replace fluid losses in the recovery period and see that fluid is available at meal/snack times to encourage further intake.
- ✓ By drinking 250-500ml immediately before running on to the rugby field and then topping up with an extra 100ml every 10 minutes (or as close to that as possible) during the match making use of injury time and half time breaks will help with absorption and tolerance. – As a rough guide, drink between 500-800ml per hour if you are a 70-90kg player. Heavier players may require more, and in hot or humid weather conditions all players should drink more.
- ✓ More is not better – do not drink at rates greater than your sweat losses i.e. you should not gain weight during training or matches.

### How much fluid after training or a match? <sup>[1]</sup>

After exercise, you will continue to lose fluid by sweating or urinating, so you need to replace fluids and drink at regular intervals. Remember that carbohydrate-containing drinks will also help minimise any muscle damage and will restore muscle energy stores more rapidly. A small amount of protein can be included, particularly if appetite is limited, and additional recovery adaptation goals such as improving post exercise protein balance, decreasing muscle soreness and damage, are desired.

You can also calculate the difference between your pre- and post- body weights and use this to give an indication of how much fluid is needed for rehydration. A general guideline of a volume equal to 125-150% of the fluid deficit is often recommended if you only have 2-4 hours post-training to fully rehydrate (e.g., if playing in 2-3 Sevens matches). Otherwise you will make up these deficits by eating and drinking regularly.

- Avoid alcohol in the recovery period as alcohol encourages further fluid losses. (see below)

### Is there an ideal drink? <sup>[4]</sup>

The 'ideal sports drink' is one that allows you to meet your fluid and carbohydrate requirements and is 'easy to stomach'. It should fulfil the following 3 basic criteria:

- ✓ Taste : good
- ✓ Temperature : colder liquids more palatable
- ✓ Tolerance : concentrations of 4-8% are usually better tolerated  
(> 10 % ↓ rate of gastric emptying and ↑ gastric upset;  
avoid carbonated (fizzy) drinks before, during or after exercise)

Depending on your needs, you can also vary the amount of carbohydrate relative to fluid. In other words, if you are only training for <45 minutes, your goal for hydration will be greater than your need for carbohydrate and you could get by with just water; if you are restricting your dietary energy intake or deliberately 'training low' and the session is 45-75min, frequent 10s mouth swirls of a carbohydrate-drink with additional water may be all you require; but if you are training or playing a match at a high intensity for a longer period of time, a drink with a higher concentration of carbohydrate would be beneficial.

Note – you can also make your own sports drinks, if on a budget

### What about other ingredients and electrolytes? <sup>[4]</sup>

Most sports drinks also contain a small amount of **sodium (salt)**. More sodium is required in hotter conditions and these requirements can be met by commercial oral rehydration powders and/or by adding extra salt to food, and salty snacks.

Other electrolytes such as potassium and magnesium may be included however there is no conclusive evidence that this enhances hydration or reduces cramping.

Some sports drinks may contain **caffeine** with amounts typically ranging from 20-80mg/serving. Although caffeine may be ergogenic (e.g. decreasing perception of effort) for some players, recent research has shown that the performance enhancing benefits can be achieved with doses as low as 1-3 mg/kg that may be well within the normal dietary intake. This means that rather than necessarily increasing your caffeine intake, you may benefit by strategically timing your caffeine intake around training/competition. However, you also need to consider side-effects of caffeine - increase in heart rate, impairments or alterations of fine motor control and technique, anxiety or over-arousal as well as the potential interactions between caffeine and other supplements/nutrients like e.g. bicarbonate, creatine, nitrate/beetroot juice. Furthermore, the use of caffeine by children carries risk.

#### **WATCH OUT FOR:**

Other ingredients like protein, amino acids, and herbals can be added, may not always be warranted and may also increase the risk of testing positive for a banned or prohibited substance.

#### **How to keep your cool**

Cooling strategies are very important to prevent heatstroke in hot conditions. These include staying in the shade during breaks and removing warm jerseys; using cold-water ice packs and side-line fans, etc.

Allowing athletes to acclimatise to hot conditions for 7-10 days should also be a component of managing potential heat illness.

**Precooling** is a strategy that is increasingly being used by elite athletes when exercise is carried out in a hot and humid environment. As part of this strategy, in the 30-60 minutes prior to exercise, sports drinks are consumed in “**slushie**” (**ice slurry**) form and an iced towel/vest/band is used to lower skin temperature. <sup>[5]</sup>

## Tips to encourage better fluid practices and reduce the risk of heat stress

- Always take a full drinks bottle, with your name on it, to training and matches.
- See that this is accessible.
- Familiarise yourself with your own fluid requirements in different environmental conditions – in hotter and more humid conditions you may need to drink more. You can use your body weight as a *general* guideline and to encourage an increased awareness of individual fluid requirements. Weigh yourself before and after exercise in minimal clothing, and correct for urine losses and drink volume.
- Include fluid breaks when training.
- Choose a drink that you like. Ensure drinks are cool as they taste better than warm drinks. If playing in hot and humid conditions, try an ice slushie before playing.
- Meal consumption is critical to ensure full hydration on a day-to-day basis. Eating food promotes fluid intake and retention. See that you have fluid available at all meals and snacks.
- When travelling, take extra drinks with you. Air travel, air conditioning and altitude will all increase your fluid requirements.

## Alcohol

In team sports, the culture may often promote post-game alcohol binges. Alcohol reduces reaction time, and impairs balance, accuracy, hand-eye co-ordination, strength, power and endurance, and impairs body temperature regulation. Alcohol also increases high-risk behaviour that may lead to poor judgement and reduced inhibition, accidents, injuries and even death. Alcohol also distracts from sound recovery strategies, injury treatment and sleep. Drinking alcohol after a match interferes with the recovery of the body's carbohydrate stores, and acts as a diuretic, thereby increasing urinary fluid losses and so delaying rehydration. Alcohol also has a vasodilatory effect, which can increase bleeding and swelling, thus delaying or slowing recovery of soft-tissue damage and rehabilitation from injury.

With an energy density of 29kJ (7kcal)/gram, alcohol can contribute significantly to daily energy intake, causing fat gain. Alcohol may also lead to increased storage of dietary fat, as it is, suppresses the oxidation of fat, which is then stored.

## Practical Tips

1. Adhere to the 24-hour rule, i.e. - avoid alcohol in the 24 hours before a match and in the 24 hours after a match, if any soft tissue injuries or bruising have occurred. Some teams may have a ban on alcohol intake!
2. Ensure that plenty of non-alcoholic drinks are available after training or a match. Those players who choose to drink alcohol should ensure that they are adequately rehydrated and refuelled with carbohydrates and fluid before drinking alcoholic drinks which in any case should be limited.
3. Note that although some alcoholic beverages do contain carbohydrate (e.g. beer) the alcohol content of the drink, is a diuretic and inhibits the restoration of glycogen in the muscles. This affects performance and recovery; therefore, players should rather resort to other more appropriate sources of carbohydrate.

## References

1. Meltzer S and Hopkins N. Nutrition for Technical and Skill-based training. In: *Sport and Exercise Nutrition*. First Edition. 2011. The Nutrition Society. Blackwell Publishing Ltd.
2. Burke LM, Hawley JA, Wong SH, Jeukendrup AE. Carbohydrates for training and competition. *J Sports Sci*. 2011 Jun 8:1-11.
3. Noakes TD with Vlismas M. "Challenging Beliefs: Memoirs of a Career". Zebra Press 2012.
4. Sports Drinks. (carbohydrate-electrolyte drinks). AIS Sports Supplements Framework. [http://www.ausport.gov.au/\\_\\_data/assets/pdf\\_file/0008/594170/CORP\\_33413\\_SSF\\_Sports\\_drinks\\_FS.pdf](http://www.ausport.gov.au/__data/assets/pdf_file/0008/594170/CORP_33413_SSF_Sports_drinks_FS.pdf)
5. Ross M, Abbiss C, Laursen P, Martin D, and Burke LM. Precooling methods and their effects on athletic performance: a systematic review and practical applications. *Sports Med* 2013 43:207-225.

**Document Compiled by Shelly Meltzer, Shelly Meltzer & Associates**