



fittips



# Sports Drinks

Important fitness information in bite-sized, easy-to-digest chunks, so that you can get down to the nitty gritty of your programmes and not miss out, by Andrew Hamilton



A bag of salty water may not sound very flattering but it's a pretty fair description of your body! According to evolutionists, life on land only became possible when organisms developed means of taking their own 'bit of sea' with them. Although humans are far removed from those humble beginnings, we still carry our own bit of 'sea water' within us – about one gallon for every stone of body weight – containing all the right mineral salts for our optimum physical function. Once we start losing even small amounts of this fluid, we suffer. A loss of just 1%

of body weight through dehydration can significantly reduce performance. A loss of 2-3% will lead to the onset of fatigue and cramps. Even greater losses can lead to heat stroke, coma and even death. Hydration then is vital for anybody in serious training and is especially important in hot conditions (with increased sweating when losses are more rapid) or during long events. This explains the growing popularity of sports drinks in the kitbag, which aim to not only keep the volume and concentration of this salty water constant, but may also supply useful carbohydrates for hard working muscles to boot.

**For muscles to contract continually they need three things:**

- Water.
- Electrolyte minerals (sodium, potassium, calcium and magnesium), which help provide the electrical stimulus required to 'fire' the muscle fibres.
- Glycogen, a high grade fuel made from carbohydrates and which can actually be stored in the muscles.

The first priority for any athlete is to maintain water and electrolyte levels, where even small losses can have disastrous consequences. Athletes participating in longer events (90+ minutes), or those with high volumes of weekly training also face the problem of glycogen depletion (which can severely dent any high intensity training programme) and may benefit from drinks containing added carbohydrate.

**Sports drinks fall into three categories:**

- Fluid and electrolyte replacement drinks
- Energy replacement drinks
- Energy gels

**Fluid/electrolyte drinks** aim to provide fluid and electrolytes in an 'isotonic' form, ie. the same concentration (or 'saltiness') as blood plasma. Research has shown that the water in isotonic drinks is absorbed from the stomach more rapidly than pure water alone. The added electrolyte minerals help to make the drink isotonic and to replace minerals lost through sweating. Fluid replacement drinks are especially useful in hot conditions where copious sweating occurs or where the event is over an hour long. Some fluid replacement drinks also provide small amounts of carbohydrate, but this is often in order to help make the drink isotonic rather than to supply large amounts for muscle glycogen replenishment. Ready-mixed drinks can be very expensive – it's a better bet to buy drinks in powdered form and mix your own. This also allows you to fine tune for taste preferences. If funds are really tight, you can make your own cheap and cheerful fluid/electrolyte replacement drink by taking a litre of pure orange juice and adding a litre of water and half a teaspoon of



### SPORTS DRINKS TIPS

- Always read labels and check the quality of what you're buying. Some so-called sports drinks are nothing more than exorbitantly priced sugary water.
- Don't make the mistake of using a new drink for the first time in a race situation. Always test it out in training first.
- If you follow a high carbohydrate diet, workouts of less than an hour are more likely to benefit from fluid replacement rather than energy drinks. However, energy drinks can assist recovery.
- Don't just think about hydration during training or racing. Keep well hydrated at ALL times by drinking plenty of fresh water. If your urine is any darker than a pale straw colour, you're dehydrated.
- Remember that the bulk of your energy should be coming from high quality complex carbohydrates in your daily diet, rather than from sports drinks.
- Make sure you consume plenty of fresh fruits and vegetables (rich in potassium and magnesium) and some dairy produce (rich in calcium) to maintain electrolyte mineral balance. Don't worry about sodium – most diets contain too much rather than too little.

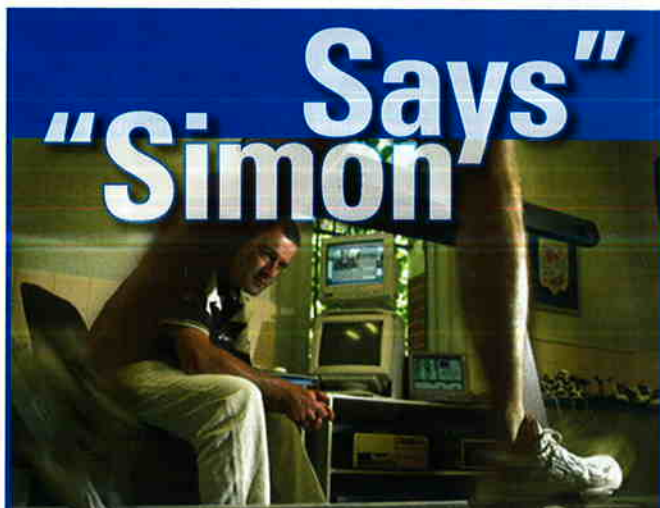
table salt. While not as technically advanced as some of the better products out there, it is at least reasonably pleasant tasting!

**Energy replacement drinks** aim to replace energy (and fluid) by supplying soluble carbohydrates in a drink form. The advantage of using soluble carbohydrate (rather than eating solid food) is that little or no digestion is needed, which means that these drinks can be consumed during training or competition, helping to delay the onset of glycogen depletion. However, there's far more to making a decent energy

### There's far more to making a decent energy replacement drink than just dissolving a load of sugar in water and bottling it

replacement drink than just dissolving a load of sugar in water and bottling it. This is because simple sugars such as sucrose (table sugar), glucose and fructose release their energy to the body very rapidly. While this does provide a quick burst of energy, the downside is that (all too often) this energy boost is followed by a 'sugar crash' a short while later. To make things worse, sugary drinks that are concentrated enough to supply useful amounts of carbohydrate also exert a high 'osmotic pressure' in the stomach. This means they draw fluid into the stomach from the rest of the body, resulting in poor absorption, abdominal bloating and cramps – hardly desirable! The better energy drinks get round this by supplying carbohydrate in the form of malto-dextrins or, better still, as glucose polymers. These behave much more like starchy carbohydrates in the body, releasing their energy much more gradually, and also exert a far lower osmotic pressure in the stomach. This means that you can take significant amounts of carbohydrate in a drink and still benefit from rapid absorption without sugar crashes or bloating effects. The drawback, though, is cost. Long chain glucose polymers in particular are not cheap! Finally, it's worth pointing out that although these drinks also supply fluid, the presence of significant amounts of carbohydrate tends to mean that the water is not absorbed quite as quickly as water in fluid replacement drinks.

**Energy gels** are a fairly recent development. The best examples (such as those developed by Enduro) provide soluble carbohydrate in a gel-like form, which is consumed directly from the sachet. The gels supply carbohydrate in an isotonic form (for rapid absorption), with a minimum of added water. Gels are useful for those occasions when only water is available, or the supply of your normal energy drink cannot be guaranteed – for example, at race feeding stations. By consuming the gel and drinking water, you can ensure that energy and fluid replacement needs are met – wherever you are.



**Simon J. Bartold**  
B Sc., F.A.S.M.F., F.A.A.P.S.M.  
Specialist Sports Podiatrist  
Research Fellow, University of South Australia,  
asics International Research Co-ordinator

### Q: How do orthotics work?

**A:** One of the most common conservative treatments for musculoskeletal pain is the prescription of foot orthoses. These can either be customized in a rigid or semi-rigid material from a plaster reproduction of the foot or heat-molded to the weight-bearing foot with high-density foam.

Orthotic devices, or 'orthoses', have been used for the past 50 years to treat a variety of musculoskeletal conditions, especially related to the lower limb. The practice of inserting some form of supportive insole into a shoe has been popular in Europe, especially the German speaking countries, since the beginning of the last century. However, the mainstream popularity and use of orthoses was strongly tied to the running boom in the United States in the late 70s and early 80s when there was an explosion of overuse injuries due to the fact that 20 million Americans began running for the first time. Many of these injuries, especially those localized around the knee and below, were attributed to either poor or inadequate footwear, or to "faulty biomechanics". A whole new philosophy was born at this time within the podiatry profession, and it became known as podiatric biomechanics, in other words, the specific study of movement patterns, normal and abnormal, of the human foot and leg.

There remains little doubt today that the prescription of orthotic devices have helped or even cured many athletes worldwide of lower limb musculoskeletal injury, however, in this day of evidence based medicine, the most important question is, how?

### Orthotic Devices – do they work?

There are many problems associated with establishing this mechanism scientifically. The majority of studies indicate that orthotic devices are not able to significantly influence actual foot or joint position, and therefore would not function via a mechanical or positional change to the foot, as quoted so often in podiatric, and other, literature. By far the most credible theory for orthotic function today is that they provide altered sensation to the brain, which then alters the movement pattern in a positive manner most likely to protect the athlete. There is a strong link here with our understanding of how athletic footwear works.

This may explain why the success of orthotic therapy is very operator dependent. In other words, there is an art within the science, as with all branches of medicine, and some podiatrists simply have a much better inherent feel than others for what is required from orthotics to achieve the specific treatment goal.