Food for thought – can't stomach the sugar?

The need for carbohydrate feeding during long races is well established – your body's glycogen stores will not last for ever and your race performance starts to be impacted after something between1 and 2 hours, depending upon fitness, speed and terrain.

Most sports drinks and gels are glucose based, which makes sense as this is the smallest of the sugars and it is rapidly absorbed into the bloodstream – just where you want it to be available as fuel for your muscles.

If you're running in endurance events, you're going to use a lot of fuel and so you'll want to take on as many carbs as you can, won't you? Well, this is one of those situations where 'more' is not necessarily 'better'.

It has been established experimentally that there is a maximum rate at which our bodies can utilise the glucose that we take on board, even if higher levels are ingested (in the form of carbohydrate drinks or gels, for example). This maximum is around 1g glucose per kg body weight per hour, so for a 60kg woman that's 60g per hour and for an 80kg man it would be 80g per hour. Most sports drinks provide around 64g glucose per litre (32g per standard bottle), so, ladies, that's 2 bottles per hour, while the chaps need a bit more.

Some runners can drink these volumes of fluid and cope with the concentration of glucose, whereas others suffer a variety of gastro-intestinal side effects - if that's you, you won't need me to go into detail here! Problems are often related to the concentration of glucose, so a more dilute version of your sports drink may be OK.

But more dilute means less carbohydrate and therefore less fuel for your race.

Fructose, whilst being a very similar sugar to glucose, is absorbed through a slightly different route in the gut. This knowledge gives us an alternative option – to mix glucose and fructose as the fuel source in sports drinks or gels. Studies have shown that this mixture of sugars is a more effective fuel for endurance exercise, in other words it gets more carbohydrate to the muscles, where it is needed. In addition, a welcome extra benefit is that the mixture provokes fewer gastro-intestinal side effects than glucose alone.

So, when you're looking for sports drinks or gels to support your marathon or other long race, it is worth finding something containing glucose + fructose, ideally in the ratio of 2:1. There's still no benefit in taking on board huge amounts: 1–1.2g per kg per hour is as much as your body will be able to use, but you are likely to make the most of it, and tolerate it better, if it is the glucose + fructose combination.

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