



## High Food: Climbing and the Glycemic Index

It must be hard work being a nutritionist these days, what with a new wacky diet concept popping up every few months, attempting to rewrite the established food rules and undermining the official party line on what we should be eating. It no longer seems okay to just stick with your five fruit portions and a balanced diet of carbohydrate, protein and fat. No, it looks like we should, in fact, be eating just fruit, no wait a minute, just eating protein, no, fat, oh sorry no, we shouldn't eat anything at all and just get our nutrition from the sun (the person who thought up this last one obviously lived in Boulder, not Barnsley).

The last big upset in the diet world came from that troublemaker Dr Atkins, with his philosophy of 'eat meat - stay thin', something that did seem to work

well, even if getting thin could potentially be the result of heart failure. Maybe the Doctor had come up with the idea after reading the quote about the best way to lose weight is to get sick and the best way to keep the weight off is to die.

Climbers, although notoriously obsessed with body fat, require more out of their diet than a way of getting from meal to meal, as food is what fuels what you do and so applying the right food for whatever type of activity you do is crucial for success. Luckily for us the latest dietary trend could offer us some valuable ideas on how to get the most out of the food we have, important if weight/energy ratio is crucial for success.



This latest big thing in the food world is the 'Glycemic Index', a term that seems to crop up more often than the words 'Justin Timberlake' in women's magazines these

days. The basic principle is that you no longer look at carbohydrates in the narrow term of simple calorie content in order to work out how much energy they release. Instead carbohydrates are broken down further so you can look at the numerous components that make up the carbohydrate and how each affects you. This newer approach and understanding holds a great deal of promise to anyone who's willing to apply it to climbing, especially if that climbing involves endurance.

## PUTTING IN THE CORRECT FUEL

Imagine the human body as a car, with its digestive system being the engine. This engine runs on a fancy twin fuel system, carbohydrate and fat, with protein only normally being used to repair the dented bodywork unless things are pretty desperate (a bit like running your car on Turtle Wax). The engine converts both of these nutrients into sugar (glucose actually but for this article we'll call it sugar), which produces the spark that turns your engine (your cells). You can view carbohydrate as the high-octane rocket fuel while fat is the diesel, a slow burn fuel, designed to keep us ticking over day after day. This twin fuel system gave us the ability to sprint off when chased by a sabre tooth tiger and survive the famine when the tiger ate all the sheep you were supposed to be looking after.

This difference in expected fuel usage can be seen in the amounts stored by the body. The average person has 16,000 calories stored in their body (Chilean rugby players may have more), which makes it obvious why we made good sabre tooth tiger food. Of this only 2,000 calories comes from sugar, while 23,000 comes from protein (muscles, skin etc) and the rest, all 13,000 calories of it, from fat. As you can see the amount of sugar available is severely limited, giving you about two hours worth of working hard (anaerobically) and is why you can easily bonk or hit the wall if you don't top up the tank. It makes sense that using fat as fuel would be best, but unfortunately fat takes longer to break down into the sugar your engine needs to burn and most people won't go into an affective fat burning state for over two hours when exercising, meaning by then it might be too late.

## THE NOT SO SWEET SIDE OF SUGAR BURNING

Sugar is designed to supply energy to the nervous system, brain and to provide that emergency power boost. Sugar also provides that power-up energy used to get us started and hopefully allow us to slip into a more long term and efficient fat burning state.

When this limited store of sugars begins to slip into a deficit of 20% the brain sends you a signal to warn you of this fact (a bit like your petrol warning light coming on after only half an hour after filling up), after all it's designed not to want to be out of go juice if something big and hairy takes an interest and it will try to avoid reducing its stores by more than 20%. This warning signal takes the form of loss of concentration, dizziness, irritability, lack of co-ordination and, in extreme cases, blurry vision. These warning signals have been experienced by anyone who's climbed,

walked or run hard in the mountains; a kind of narrowing of vision where all you can think about is the pain and all the joy and colour drains out of the experience. We interpret these signs that we need more food to revive us and turn the situation around and what food do we know will give us fast energy? That's right, sugar, in the form of carbohydrates (chocolate, banana, sandwich).

So what's the problem? Just keep on downing that sugar and keep the tank topped up and everything will be fine? Well, unfortunately, like anything that works so well sugar has a number of side effects if taken to excess.

Once in your small intestine, that chocolate bar or sandwich is broken down into simple sugars so it can be transferred into the blood and absorbed by the body. Now this sugar is new in town and doesn't know where it is supposed to be heading, plus the cells of the body where it's heading are pretty cautious and won't be letting them in unless they are sure the sugar is kosher. This is where the pancreas comes in. Like a taxi HQ it gets the call from the brain telling it that there's a long cue of sugar molecules waiting at the small intestine that need dealing with straight away (remember the brain might be a bit irritable at this point). So the HQ sends out its insulin hormone taxis (stick with it) to pick them up and take them to the right destination. Once picked up they are whisked off through the blood to the nearest cell, where unbeknownst to the poor sugar molecule it gets robbed of all its energy and the brain relaxes.

To begin with the pancreas taxi HQ sends out just the right amount of taxis to get all the sugars to their cells, but as the shift goes on and the work load stays high, with sugars coming and going constantly, the old pancreas loses control sending out more and more taxis until the bloodstream picks up every stray sugar molecule they find and whisks them off to the nearest cells. This causes the normal blood sugar level to drop (hypoglycaemia), triggers the brain to send more signals that you need sugar, even though your cells are chocker with the stuff. With all this sugar going around all the organs get on the case and ignoring fatty molecules, start asking for more sugar, putting you even further into the red.

This is the classic sugar rush and sugar crash experience. It goes without saying that this kind of boom and bust state isn't conducive to a healthy state of body or mind and doesn't just limit your performance but can also lead to mistakes, low morale (leading to failure) and worse of all, ratty partners. In the long term this kind of sugar-burning state is very destructive on the body, leading to a whole host of serious problems including diabetes and carbohydrate intolerance. Furthermore a lot of this excess sugar is stored away as fat, meaning even if you're exercising hard, eating lots of bananas will make you as fat as eating chocolate.

#### MORE THAN AN ISSUE OF COMPLEXITY VERSUS SIMPLICITY

Now the importance of the Glycemic Index is that it breaks down the carbohydrates into those that enter the blood stream quickly (gushers) and those that enter slowly (tricklers). Now many people will immediately link this with the principle of complex and simple carbohydrates, which it was thought had the same effect on blood sugar levels. The problem is that it's been found that it's not that simple, as some complex

carbohydrates are gushers and some simple carbohydrates are tricklers. The problem with the gushers (processed carbohydrates most usually) is that they enter the blood stream in a huge dose, increasing insulin levels and causing a huge spike. Such a huge amount of sugar cannot be used and so is changed into fat, which is one of the reasons why obesity levels are so high. The tricklers on the other hand are much harder to break down, meaning they drip into the bloodstream, reducing the stress on the pancreas and stopping the side effects of variable blood sugar levels.

## APPLYING THE DIET TO THE HILLS

It's obvious that most food will contain a mixture of tricklers and gushers, but the important thing is to know which is which and attempt to maintain an overall low to medium GI. If, say, you're running a mountain marathon and it's day two then it's fine to swallow a mouthful of jelly babies, but if you're scrambling up the Matterhorn and come over all tired, then doing so isn't going to do you much good long term. If you look at your food - which is often limited - as to what type of calorie you'll be getting, then you will hugely improve your energy levels. There isn't room here to go into the ratings of all food (see further reading below or look on the web) but I guarantee there are some surprises, such as, couscous and potato powder being gushers, whereas some pasta and rice are low to intermediates and that a sugar cube has a lower GI than a slice of white bread. Once understood, you'll be eating whole wheat bread with Nutella for lunch rather than baguette with cheese when in the Alps, more apples and less bananas when cragging and feel less guilty eating Snicker bars rather than the power variety. Understanding the GI, and turning what looks like another daft dietary fad into something that lets you keep the weight on, will definitely help you to maintain your energy levels and, most importantly, guarantee that as many calories as possible will be used to power your body and in the process helping you stay alert, positive and make that 'let's go down' feeling far less common.

Further reading

- The New Glucose Revolution Complete Guide to Glycemic Index Values by Miller
- Good Carbs, Bad Carbs by Burtani and Rao

## THE ULTIMATE HILL START

This is a recipe for a muesli hill mix, which follows the principles of a low trickle diet. It can be made in half an hour and is very adaptable to your tastes. This recipe can also be used as the foundation of a flapjack recipe for snacks or bad bivvy breakfasts (where you just want to gobble the food down in your sleeping bag).

The recipe makes around 10 servings.

- 1/2 cup honey
- 1 cups oats

- 1/2 cup ground flaxseed
  - 1 tbs cinnamon
  - 3/4 cup almonds (or any nuts)
  - 1/2 cup soy nuts
  - 1 cup dried berries or currants
1. Grease a large baking pan (9 x 10 x 2 1/2) with vegetable oil and then add in the honey.
  2. Place the pan in a cold oven and turn on to 300°.
  3. In another bowl mix all the other ingredients apart from the dried fruit.
  4. Once the honey has melted remove it from the oven and mix in the oat mixture, mixing it all together so the oats are all coated in honey, then spread the mixture out.
  5. Bake for 20 minutes or until oats are toasted, turning the mixture every five minutes.
  6. Remove from oven and allow to cool.
  7. Add the dried fruit, plenty of milk powder and anything else you want (sugar, chocolate drops) and bag it for your trip.

The feature is taken from the September 2004 Issue of High Mountain magazine - full details at