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Fuelling for Optimum Performance in Ultras

By Andy DuBois

Nausea and vomiting is one of the main reasons for a DNF during an ultra. Among finishers of the Western States Endurance Run, up to 40% of them experience nausea and vomiting. Visibly, it is critical that you have an effective strategy going into a big race.

1. How Much Should I Eat?

The answer depends on how much energy you can absorb, rather than how much you burn. The difference between the two comes from stored muscle glycogen and body fat.

How many calories can we absorb? This figure depends on the types of calories, but the general recommendation is 60g of glucose and 30g of fructose. I recommend a strategy of eating the least amount possible. Consuming less fuel means you must be well adapted to tapping into existing fuel sources, i.e., fat stores in the body. This does need to be practised as fat oxidation uses a different metabolic pathway.

Factors affecting absorption: The concentration of the carbohydrates in your stomach affects absorption. Simple carbohydrates are absorbed fastest in a 5-8% solution, whereas complex carbs can be absorbed in concentrations as high as 15-18%. This means that simple carbohydrates (e.g., glucose, sucrose) need more water to be absorbed than complex carbohydrates (e.g., maltodextrin). That's why sports drinks containing simple sugars are always 6-8% in concentration, which is not to say that one is better than the other.

Factors affecting calories needed: The lighter you are, and the slower you go, the less you'll need. Pace, or intensity, is definitely a huge determinator of calorie requirements, because most people are able to rely on 'fat burning' when exercising at a lower heart rate. However, it is very important to note here that aerobic baseline can be improved and we can work on fat oxidation at higher heart rates through training and nutrition strategies. This may be advantageous to those runners struggling with not throwing up their race fuel during endurance events.

Experimenting in long training runs is the best way to learn what your energy requirements are.

How can you increase your fat-burning ability? This is about training your body to exercise without additional carbohydrates. Long runs performed with no breakfast, and no additional carbohydrates, are great for starters. It is possible to run 4h+ on nothing but water. *However*, training for race nutrition is also necessary. I recommend building your long runs to 4h with no calories, and then runs over 4h to practise race nutrition.

Your requirements will depend on your fat metabolism, and they will even fluctuate throughout a race as the intensity varies — i.e., many athletes will go faster in the first half of an ultra than the second, so you will need to consume more fuel in the first half with a heavier reliance on stored body fat in the second.

Where to start? Experimenting in long training runs is the best way to learn what your energy requirements are. Start with approximately 30-40g of carbs per hour, erring on the side of less rather than more.

Why less rather than more? If you have too many calories, you have to slow down to allow more time for them to be digested before the muscles can get the calories they need. In addition, training with less will help build a strong aerobic baseline and assist the body in getting used to tapping into stored fat as energy.

2. What Should I Eat?

The range of calories consumed during races is huge. From sports nutrition products, like Tailwind and Hammer, to real food like nuts and dried fruit, and then processed products like chocolate or Coke. There are a few factors that will influence your choices.

Practical considerations: Can you transport the food easily in your pack? Bananas might be squashed after

◀ *Illustration: Kirk Wescom*

a few hours, and chocolate bars may turn into an unpalatable mess in the heat.

Taste: If it doesn't taste good, then you will struggle to consume it during an ultra. What tastes good 2h into an ultra may be unpalatable after 10h+. A good strategy is to mix up the food choices hourly, so that you don't succumb to flavour fatigue. Given that most nutrition products are sweet, mixing them up with something salty can extend how long you can tolerate the product for. For instance, you can combine a sports drink with some slices of boiled, salted potato every couple of hours.

Fibre, fat, and protein: These will all slow down absorption — which may or may not be a bad thing, depending on if you need quick energy, or slow-release energy. But, be aware, if you are having a low spot and you have a high-fibre sandwich with butter and chicken in it, it is going to take a while for your body to process all that and get the glycogen it needs.

We don't need to add fat, as we have plenty of fat to burn. Even a 55kg male with 5% body fat will have 2.75kg of fat on him, which equates to 24,750 potential calories!

Protein is burnt to a small degree in ultra races, but there is no consensus on whether consuming small amounts of protein will spare the body breaking down its own muscle tissue.

Absorption: Different carbohydrates are absorbed at different rates depending on the concentration. You need to ensure sufficient water is taken to enable optimal absorption. Pre-made drinks are easy since you can mix them to the desired concentration, but real food gets a lot trickier. For example, how much water do you need to quickly absorb a few potato wedges?

Whilst it may be possible to calculate that on its own, when you factor in what is already in the stomach, it's basically impossible and comes down to trial and error in your training runs.

3. When Should I Eat?

Regularly, and in small quantities, is key. A large intake every 2h is going to be much harder to digest than a small amount every 20-30min. In a long race, you need a strategy to ensure you don't fall behind. For example, you can set a periodical beeper on your watch, or mark your water bottle to remind yourself to consume fuel. Sounds ridiculous, but after many hours on your feet, you will struggle to remember these details.

Do not believe everything you read — the theory, and even the 'science,' behind many commercial fuelling options and suggestions may be great, but if you cannot stomach it, then it's a total waste of money.

4. What to Do If Something Goes Wrong?

Prevention is always better than the cure — but if things do go wrong then you only have a few options, and choosing the right option is key.

Stomach fine, energy levels low: The simple solution is consume more calories. If you are feeling very low, then something like Coke to pick you up fast may be needed, but be aware, there will be a crash in the near future if you don't get some other calories into your system.

Energy levels low, stomach feels full: You need to decide whether or not to drink more water. Think back to how much food you have had and how much you've had to drink — if you consumed more food than drink, then by drinking more water you will decrease the concentration of carbs in your stomach, making it easier for them to be absorbed.

Bloated and nauseous: You need to slow down and allow more blood to flow to the stomach to aid absorption, which may take hours.

One solution is a carbohydrate mouth rinse. It tricks the brain into thinking there is fuel in the muscles, and as such gives you enough energy to keep you going until your stomach can absorb what you have put into it. Depending on your pace, you can probably get by for no more than an hour, or two, just by rinsing.

People have reported that ginger tablets, or ginger beer, may help nausea in a race, while I personally have found that Coke helps settle a dodgy stomach, as it promotes burping.

Flavour fatigue: If your taste buds are rebelling at the thought of consuming any more of your planned food, then try something different — maybe some salted food (not because it has sodium, but because saltiness is the opposite of sweet-tasting snacks).

Coping with the heat: Heat will affect the stomach, as more blood is drawn to the skin to be cooled and therefore less blood is available for the stomach's operation. Keeping the body cooled is more important than staying hydrated — if you keep the body cool, then you don't need to drink as much to begin with.

In addition, do not believe everything you read. The theory, and even the 'science,' behind many commercial fuelling options and suggestions may be great, but if you cannot stomach it, then it's a total waste of money.

Andy is an award-winning personal trainer and elite endurance athlete specialising in ultra running. You can find more useful info on his ultra running coach website (www.mile27.com.au).