

## Nutrition for Ultramarathon

The harder you train, and the closer to your limit of physical performance you reach, the more critical will be your nutrition. The HCC will take you close to your limit, so don't let poor nutrition be your limiting factor.

Ultramarathon nutrition is the combination of food and liquid (water and electrolytes), which partially replenishes that lost through energy expenditure and dehydration (expiration, sweat, urine etc).

**You cannot replace food and liquids at the same rate as they are being used during the event (unless you paddle really slowly!)**

During the first two hours of the event, your body mainly uses glycogen stored in the muscles as its high-energy source. It then begins to rely more on carbohydrate intake, small amounts of protein and stored fat to provide energy.

During the event, you will use between 400 and 600 calories, and up to 1 litre of fluid per hour. However, you cannot replace this amount of energy at the same rate. There is a limit to how much carbohydrate and fluid can be processed by the digestive system, and this is generally around 240 – 280 calories for the average paddler; 60 - 70 grams carbs per hour or just shy of 1gram/kg bodyweight. Water can only be absorbed at around 550ml/hr.

So, ultramarathon paddling is an energy deficit sport. You will never be able to consume and process as much energy and liquid as you use, unless you lower your performance level.

**To improve long-term performance, you need to consume just the right amount of carbohydrates and smaller amounts of protein at the right time, and to train your body to use its stored fats.**

Fat is a far slower, oxygen dependent metabolic process, and cannot provide the energy levels at the rate that pure carbohydrates can. However stored fats (adipose and intramuscular) are already in the body making them an accessible energy source when there is a limit to how much carbohydrate can be ingested. **Note:** You cannot burn fat without also burning carbohydrates. Run out of food, and you can't use your fat. You can't use ingested fats, so don't add them to your race food.

### Fluid Intake

Hydration is even more important to manage correctly than food. Too little hydration results in lower performance, stomach cramps, dizziness and overheating through lower blood volume. Conversely, too much water can cause water intoxication as the blood becomes thinned, with lowered relative levels of sodium and other electrolytes. At least one club member has suffered from this in the past. It can be dangerous, in fact sometimes fatal.

You will use up to a litre of fluid every hour, but you can only consume around 500 – 630 ml per hour. If you are hot, even on a cold night, sweat will contribute substantially to dehydration and loss of electrolytes, though expiration is still the biggest cause.

Once again, at higher performance levels hydration is a deficit situation. A paddler who is paddling at maximum sustainable effort for the entire race should expect to lose between 1% and 3% bodymass over the duration of the event through fluid loss. It is critical to be fully hydrated in the days leading up to the event; drinking lots the night before is too late.

### **How do we maximise fluid intake**

Electrolyte balance should be maintained throughout the race, for several reasons. Without the right osmolarity, it is more difficult to ingest liquids through the gut wall. Becoming dehydrated causes the blood that should be involved in absorption of food, being diverted to the muscles. This leads to less effective absorption of food and electrolytes, thereby exacerbating the hydration and energy level problem. Staying hydrated means balancing electrolyte losses with replacement elements through the event. This will become more necessary as the race goes on.

### **Electrolytes**

The various elements contained in electrolyte supplements serve various purposes, mainly in maintaining muscle control and power. They create the electrical basis for muscle contraction:

Sodium: Fluid balance and blood pressure control (osmotic gradient)

Potassium : Muscle contraction (weakness and/or cramping)

Calcium: Muscle contraction (weakness and/or cramping)

Magnesium: Muscle control

Chloride:

Hydrogen Phosphate

Hydrogen Carbonate:

If you vomit or get diarrhoea during the race, substantial quantities of electrolytes will be lost, and have to be replaced in larger quantities than your normal race intake to regain the correct balance. Pure water with an electrolyte tablet can be useful to have as backup.

### **Food**

During the race, you will need a balanced nutrition than can be easily digested, while maintaining optimum performance. The paddler's choice of food will be determined by their ultimate goal; from just getting to the finish, to doing as well as they possibly can.

Don't start the race on a full stomach. You should have 'carb-loaded' two days prior to the race, so have just a standard serve carb-rich, low fibre meal the night before. On the day, sleep in as long as possible and have a smaller carb-rich meal

for late lunch. You should **avoid fibre, saturated fats and refined sugar** before and during the event. Fibre slows the digestive system as it consumes energy trying to digest the fibre, reducing its capacity to absorb carbohydrates, electrolytes and protein. Fats do likewise. Simple sugars don't provide long-term energy in useful amounts. You want the digestive system to be as free as possible to process your complex carb intake during the event. And to avoid the depletion of muscle tissue as the event goes on, consume approx 15-20% of your food as protein in the later stages.

To maximise the intake of carbs, your fluid mix should match the osmality of your body fluid. This is an Isotonic mix.

A Hypertonic mix has a higher concentration than the body, so is absorbed more slowly and not suitable during an event. A hypotonic mix is very weak, with a lower osmality than water. It may be useful to consume some hypotonic fluid (low concentration) if you are having difficulty digesting your carb intake. This would simply be a mouthful of your isotonic fluid mix followed by some pure water.

An Isotonic mix is achieved with simple sugars (mono/disaccharides) at around a 6% max solution. This will provide very little useful energy besides a short-term 'hit' followed by an equally depressing low in energy availability. Only around 100 calories/hr of simple sugars can be absorbed, leading to a substantial deficit of long-term available energy. Increasing the concentration of simple sugars, especially at higher volumes, will cause unabsorbed excess to sit in the stomach creating a bloated feeling and nausea. High levels of simple sugar can be found in carbonated soft drinks, sugary sweets etc, and especially 'energy' drinks of the 'bull' type. These drinks can lead to severe heart stress, and are best totally avoided. Leave them to the stockbrokers!

More complex carbohydrates (polysaccharides) can provide the same relative isotonic osmality at a higher concentration of between 15 and 18%, while also providing longer lasting energy due to the greater availability of calories.

As you lose electrolytes through expiration, you should plan to increase intake of electrolytes after around 4 hours. Likewise, you will need to begin consuming some added protein at a ratio of around 4 parts carb to 1 part protein. Taking water and concentrated polysaccharide carbs (GU's) is a less efficient way of controlling carbohydrate and fluid intake than using a premixed, carefully measured formula of balanced energy mix and fluid.

It is very important not to consume quantities of fibre leading up to the event, as it can sit in the gut, and create an inefficient intake of carbs while your gut attempts to digest the fibre.

On longer, events such as the HCC, and multiday events, some fibre is needed to solidify the contents of the digestive system, as soluble carbs can build up in the gut and become uncomfortable and loose.

## How do I regulate my intake?

If your general performance decreases during the Classic, your nutrition may largely be to blame. Getting it right is the simplest way of improving your performance.

You will need at least 600ml of fluid every hour if you are working hard. And on top of this, you will need 60g or so of carbs, and around 15g protein.

The easiest way to regulate your intake is to measure how much fluid you consume in one intake from your drink system.

Put 500ml of your race mix into your drink system, and measure your consumption. Either

1. See how many standard sucks it takes to consume half, or
2. Have as many sips as you can comfortably consume and measure how much you have used.

Try it while you are paddling, not next to the kitchen sink, as you will take a different amount when sitting in a boat.

You then have to regulate your intake during the race to make sure you are consuming this amount. It will mean setting an alarm on your GPS for every 20 – 30 minutes when you will need to have a drink, or doing as I do, and having a drink and a stretch at every checkpoint.

Another variable is to decide if and when you are going to replenish your food and liquid supply during the race. If you are paddling straight through, you will need to carry all your supplies with you. However, every extra litre of fluid you carry will weigh you down a little more, so you will paddle a little slower. You have to weigh up the advantages of continuing against the time lost at a checkpoint refilling.

If you are going to have 'comfort food' alongside your liquid food, remember that you have to match your solid food intake with the required amount of water. I recommend always having some pure water alongside any liquid food, to:

1. Provide you with liquids if you consume any solid food
2. Allow you to stay hydrated if you can't ingest any more food (carb overload)
3. Clear out the stomach if you have been sick, (and follow this promptly with electrolytes)
4. Supplement your isotonic mix during the event.

You will need to look at the nutrition facts of each food type you are considering to make sure they are balanced as close to ideal as possible.

Food	Calorie	Electrolytes	Carbs	Protein	Fats	Fibre
Banana	105	430mg (K)	28g -93%	1.29g - 4%	0.39g -3%	3.1g
Apple Juice, 250ml	117	300mg(K&Na)	28g -97%	0.15g -1%	0.27g -2%	0.2g
Red Bull (can)	110	0	28g -97%	1g -3%	0g -0%	0
Energy Gel (GU) sachet	100	0	25g -100%	0 -0%	0 -0%	0
Energy Gel (GU Rocktane)	100	175mg(Na&K)	25g -100%	0 -0%	0 -0%	0

Endura Optimiser 1 scoop	140		29g -81%	5.5g -16%	0.5g -3%	0
Power Bar (High Energy)	229	110mg(K & Na)	42g - 75%	10.5g - 18%	1.8g -7%	3.1g
Chocolate snack bar	210	35mg (Na)	26g -45%	3.0g -5%	13g -50%	1.0g
Muesli Bar (standard)	190	16.8mg (Na)	26g -55%	3.8g -8%	7.5g -37%	2.8g

**And one last thing:**

Water is ingested more efficiently cold than hot, so keep it cold to improve hydration.