Taking It To The Limit

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Preparing for a competitive event usually involves a heavy training schedule that will demand a great physical output. To invest not only in a proper training programme, but also in good nutrition, will pay off well with results like quicker recovery between training sessions, resistance against injuries and more endurance during your training and ultimately a great performance on the BIG DAY.

Endurance activities require sustained production of high rates of energy production, with typical dominant contribution of aerobic energy systems varying according to the speed and duration of the activity. Fatigue during endurance activities can be caused by variety of factors, which some can be manipulated through appropriate nutrition. These factors include:

- Fluid Balance
- Availability of Carbohydrate Fuel
- Disturbance to Acid-Base Status

Nutritional Issues and Challenges

- Supply athletes with fuel and nutrients needed to optimize performance during training sessions
- Optimal recovery after training sessions to improve training performance
- Optimal health and anthropometric shape
- Competition strategies with optimal intake before, during and after training or competition to reduce fatigue

Summary of Common Nutritional Issues arising in Endurance Events
Physique Issues • Desire to reduce body fat and body mass to enhance performance via enhanced power to mass relationship • Risk of dietary extremism, disordered eating and inadequate nutrition attributable to overemphasis on low body mass and body fat level
Training Issues • High energy and carbohydrate requirements to meet a heavy training load • Recovery between training sessions (refuelling, rehydration, repair and adaptation) • Adequate fuel and fluid intake during training sessions, including practice of race-day strategies • Compromise in achieving fuel requirements, and adequate intake of protein and micronutrients when energy intake is restricted to achieve body mass and body fat goals • Risk of low iron status, especially in female athletes and vegetarian eaters, secondary to inadequate dietary intake and some increase in daily requirements • Risk of menstrual disturbances in female athletes secondary to energy drain • Risk of gastrointestinal disturbances and discomfort during prolonged or high-intensity running sessions
Competition • Preparation of adequate fuel stores for race day: carbohydrate loading before races • Pre-event nutrition: topping up fuel and fluid levels without causing gastrointestinal discomfort during the race • Fuel and fluid replacement during races: consideration of need and opportunities for intake at aid stations • Travel: travelling to major competitions and on race circuit

Nutritional Solutions

It will be necessary to check your diet against the following:

Energy intake

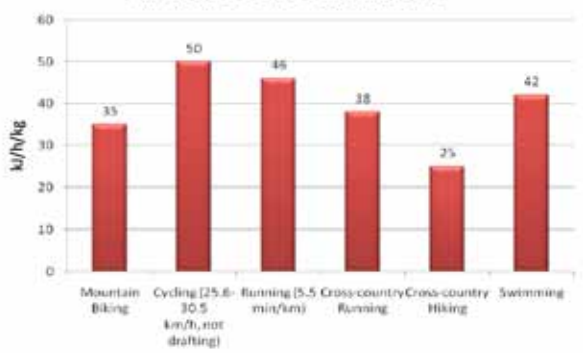
If you have the correct weight for height, age and gender and neither looses or gains weight, you are in a state of energy balance and are consuming the right amount of energy.

When determining energy need, one should consider the following:

- Resting metabolic rate which indicates the amount of energy needed every day to support daily physiological functions
- Activity energy which is influenced by the intensity and duration of activities
- In younger athletes, the energy needed to support normal growth patterns

Energy costs of different physical activities:

A dietitian can assist in calculating your energy needs



as well as analysing your current food intake in terms of energy, carbohydrates, protein, fat, vitamins and minerals.

Carbohydrate: protein: fat ratio

Once your ideal energy intake is established, you should determine the amount (grams) of carbohydrates, protein and fat that would make up the energy content of your diet.

- Carbohydrate is stored in glycogen stores within the muscle and liver. Carbohydrate is a significant energy source during higher intensity activities.
- Protein is stored within structures such as muscle. Muscles have a functional role in the body and therefore protein within the muscle is not normally as an energy source.
- Fat is stored in the adipose tissue in significant amounts. It serves as the main energy source during resting conditions.

Although physical activity places a high demand on energy intake, it is important to still focus on healthy eating with increased intake of carbohydrates, moderate protein intake and still a strict control of fat intake. An athlete should make sure that his total energy intake should be in the ratio of 55-60% carbohydrates, 15-20% protein and 25-30% fat.

Probably the single most important macronutrient the athlete should watch carefully is his/her carbohydrate intake. Carbohydrate intake should be optimal during training, but intake during the big event could also avoid early fatigue. Recovery before the next training sessions will depend on carbohydrate intake directly after an event or training session.
So, you've trained hard, preparing for the big one. Proper physical training is still the one factor that cannot be overlooked, but without expecting miracles, a lot can still be done to enhance performance and having a much more enjoyable ride by eating and drinking the right stuff.

THE BIG DAY!

Before competition

Carbohydrate loading:

Carbohydrate loading can prolong the duration of moderate intensity exercise before fatigue sets in. This can prevent the decline in pace or work output. A successful loading will although result in weight gain of around 2 kg. Carbohydrate loading is generally started 3 days prior to competition with an increased carbohydrate intake to reach an intake of 10 g/kg body weight combined with a tapering in activity.

Example of a carbohydrate loading menu:

65 kg male runner (± 650 g/day CHO)
BREAKFAST **2 cups low fibre cereal with ¾ cup Milk** **2 slices toast with Jam** **250 ml Fruit Juice**
SNACK **Fruit Bun + 600 ml Sports Drink**
LUNCH **1 large bread roll with fillings** **200 g flavoured yoghurt with banana** **600 ml sports drink**
SNACK **2 Crumpets with honey**
SUPPER **1 ½ cups cooked Rice + ½ cup Sauce** **1 cup Jelly** **600 ml Lemonade**
SNACK **1 cup liquid meal supplement**
THROUGHOUT THE DAY **100 g Jelly Sweets**

50 kg female runner (± 500g/day CHO)
BREAKFAST **1 ½ cups low fibre cereal with ¾ cup Milk** **Slice of toast with Jam** **250 ml Fruit Juice**
SNACK **Fruit Bun**
LUNCH **1 large bread roll with fillings** **200 g flavoured yoghurt** **600 ml sports drink**
SNACK **1 Crumpet with honey**
SUPPER **1 cup cooked Rice + ½ cup Sauce** **1 cup Jelly** **250 ml Lemonade**
SNACK **1 cup liquid meal supplement**
THROUGHOUT THE DAY **100g Jelly Sweets**

The meal on the morning before a competition should consist of:

- High carbohydrates – 1-4 g carbohydrates / kg body weight (200 – 300 g) eaten 2 – 4 hours before the start of the competition
- Low fat content
- Low fibre content
- Low to moderate protein content

EXAMPLES OF PRE-COMPETITION MEALS

Breakfast cereal with milk and fruit
Porridge with low fat milk and fruit juice
Pancakes with maple syrup, honey or golden syrup
Toast, muffins or crumpets with honey/jam/syrup
Baked beans on toast
Spaghetti with low fat, tomato based sauce
Jacket potato with creamed corn
Low fat breakfast bar or muesli bar and banana
Roll or sandwich with banana and honey
Fresh fruit salad with low fat yoghurt
Smoothie with low fat milk, low fat yoghurt and fruits

During competition

Fluid needs

It is important to know your fluid needs prior to a big event. Earlier advice to drink as much as possible has since been proven incorrect. The idea is to drink enough to prevent dehydration, but not too much to avoid overhydration. A good guideline to follow is taking 125-175 ml fluid every 15 minutes. This adds up to 500-700 ml per hour that can be increased to 1000-1200 ml every hour in very hot conditions. Train yourself to drink enough during practise and competition. It may take some time to get into the habit, but you'll soon reap the rewards. You can use your weight as an indicator of the amount of fluid you've lost by weighing yourself before and directly after the race. The difference in kilogram will be equal to the amount of fluid you've lost in kilograms as 1 kg weight loss = 1 litre fluid loss

Energy needs

As muscle glycogen, which is your prime energy source, gets depleted within 1.5 hour's time, fatigue will set in as a result of low blood sugar. Athletes refer to this condition as "hitting the wall" or "bonking". This will easily be avoided if carbohydrates are taken during the activity if the activity lasts longer than one hour. The recommended intake is 30-60 grams of carbohydrate per hour of activity.

EXAMPLES OF FOOD CHOICES SUPPLYING 50 G CARBOHYDRATES

CHOICE	*AMOUNT REQUIRED TO PROVIDE 50 g CHO*
Powerade (6% carbohydrate)	***600 ml***
Sports Gel (40 g sachet)	***2 sachets***
Sports Bar (60 g bar)	***1 ¼ bar***
Cereal or Muesli bars	***2 bars***
Bananas	***2 medium***
Other fruit (e.g. Oranges)	***3 medium pieces***
Jelly beans	***60 g***
Chocolate bar	***80 g***
Dried fruit	***80 g***
Cola drinks (11% carbohydrate)	***450 ml***
Sandwiches / Bread	***2 thick slices with honey / jam***
Fruit bread / Cake	***100 g***

Electrolytes (sodium, potassium)

Small quantities found in sports drinks are sufficient to prevent deficiencies. It also helps to make the drink more palatable and ensure fast gastric emptying.

The ideal drink/ snack

Carbohydrate and fluid replacement can be done through the use of sports drinks. The ideal drink contains 4-8% carbohydrates (4-8 g/100 ml) as these concentrations assure fast gastric emptying for quick energy supply. 30-60 g of carbohydrates per hour will be sufficient to cover all losses. An intake of 600 – 1000 ml of a 6% carbohydrate drink provides 30 – 60 g carbohydrates.

During a relative long race snacks can also be taken if hunger pains strike. Again the rule should apply that only snacks high in carbohydrates, low in fat and fibre should be taken, so it can be digested faster. Bananas should therefore be a suitable choice.

Remember that needs varies among athletes. Fine tune your refuelling and rehydration strategies during practices and less serious competitions – well in advance and stay with what you know works for you!