Nutrition and Hydration Strategies for Runners

The role of good nutrition
- Cover demands placed upon the body as a result of training & competition
- Balanced nutrition plan supports peak performance & may prevent injury/illness

Total Daily Energy Needs

<table>
<thead>
<tr>
<th>Gender</th>
<th>Height</th>
<th>Age</th>
<th>Weight</th>
<th>Activity</th>
<th>Kcal/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1.7m</td>
<td>19-39</td>
<td>64kg</td>
<td>Sedentary</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>1.6m</td>
<td>17-39</td>
<td>54kg</td>
<td>Sedentary</td>
<td>1650</td>
</tr>
<tr>
<td>Male</td>
<td>1.9m</td>
<td>19-30</td>
<td>83kg</td>
<td>Moderately Active</td>
<td>3040</td>
</tr>
<tr>
<td></td>
<td>1.7m</td>
<td>31-50</td>
<td>71kg</td>
<td>Sedentary</td>
<td>2370</td>
</tr>
</tbody>
</table>

Total Daily Energy Needs

<table>
<thead>
<tr>
<th>% of Total Daily energy intake</th>
<th>Calories (based on 2000 calories)</th>
<th>Calories/gm</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>10%</td>
<td>100 calories</td>
<td>4</td>
</tr>
<tr>
<td>Fats</td>
<td>30%</td>
<td>900 calories</td>
<td>9</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>55-65%</td>
<td>1100-1300 calories</td>
<td>4</td>
</tr>
</tbody>
</table>

Proteins
- Structural (muscle/bone) & Functional (hormones /enzymes) role within the body
- Made up of “building blocks” called amino acids
- Satiating effect
- Late in exercise when glycogen stores become depleted, protein will contribute as an energy source
Sourcing Proteins
In contrast with carbohydrates, foods supplying a good source of protein are typically of animal origin.

Protein content (gm/serve)

- **Lea & Perrins Sauce**
- **Ham/Smoked Salmon**
- **Chicken/Turkey**
- **Seafood (flesh)**
- **Milk**
- **Cheese**
- **Cottage Cheese**
- **Yoghurt**
- **Ice-Cream**
- **Rice**
- **Pasta**
- **Bread/Fruit Loaf**
- **Cereal**
- **Eggs**
- **Tofu**
- **Baked Beans**
- **Nuts**

Fat Intake
- Some fats considered less desirable due to their implication in some diseases.
- Saturated fat: Animal origin (dairy/meat) <10% of energy intake.
- Unsaturated fat: Plant origin (oils).
- Generally, hard fats (solid) have higher saturated fat than oils which have higher unsaturated fat.

Fat as an Energy Store
- Enough energy stored in fat to supply energy for a 1700 kilometre run.
  - 80 kg male 15% body fat: ~108,000 Cal.
- At rest and during light-to-moderate exercise we get approximately 50% of our energy from CHO and 50% from fat.
- As exercise intensity increases we rely more on CHO and less on fat.

Carbohydrates ~ premium fuel
- Stored in limited amounts within the body (enough to power a run of around 30 km).
- Preferred fuel for exercise.
- Depletion amounts to fatigue.
- Vital to restore & maintain these 'glycogen stores' to allow for peak performance.

Sourcing Carbohydrates..

The two main sources of carbohydrates in the diet that provide energy are simple and complex.

**Simple**: fruit, vegetables, honey, jam, milk & biscuits/cakes

**High Glycemic Index**

**Complex**: cereals, grains, pasta, potatoes, breads & rice

**Low Glycemic Index**

Glycemic Index Range

- **Low GI**
- **Medium GI**
- **High GI**

Blood glucose levels to go up at a moderate rate.
Rapid rise in blood glucose levels.

- **Breakfast Cereals**: Oatmeal, muesli, bran flakes, bran flakes, Puffed Wheat, Rice Krispies, Cornflakes.
- **Grains**: Brown rice, basmati rice, Doongara rice, couscous, cornmeal, tapioca, brown rice.
- **Legumes**: Broad beans, peas, lentils.
- **Starchy Vegetables**: Sweet potato, taro.
- **Fruit**: Cherries, grapefruit, peach, dried apricots, mango, paw paw, raisins, rockmelon, pineapple.
- **Other**: Skim milk, Plain Yogurt, Soy beverage, Chick peas.

- **Breakfast Cereals**: All Bran, porridge, Special K, Rice Bran.
- **Grains**: Barley, Pasta (all types), Noodles, Bulgur, semolina.
- **Legumes**: All Beans (eg kidney, soy, baked beans, peas, and lentils).
- **Starchy Vegetables**: Sweet potato, taro.
- **Fruit**: Cherries, grapefruit, peach, dried apricots, mango, paw paw, raisins, rockmelon, pineapple.
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Race day Nutrition

- Race day emotions can suppress appetite & factors such as travel can disrupt familiar eating patterns.
- Leaves valuable glycogen stores in a sub-optimal state
- Experimenting with food intake prior to training sessions affords a safe route to ensuring beneficial pre-race nutrition.

Can we reduce fatigue?

Muscle Glycogen & Exercise Duration
Carbohydrate Loading
- Technique used to enhance endurance in aerobic exercise events
- High CHO diet 24-48 hours prior to event with decrease in training
- Boosts muscle glycogen 20-40% above normal
- 8-10 grams/kg BW (~600g)

Pre Exercise Nutrition
- Meal high in carbohydrates: 2g CHO/kg BW (~160g) that is low GI (e.g. porridge, whole grain toast)
- 2-3 hours prior to start
- Serves to load muscle’s glycogen stores ensuring adequate energy for >90 mins
- Good time to take on extra fluid to ensure optimal hydration (300-600ml)
- Low in fibre & fat with low-mod protein: minimise risk of stomach upsets

During Race Nutrition?
- During your race it is time to eat high GI foods that quickly release energy and give you a fast energy boost.
- Convenient foods on the run are energy bars, energy gels and sports drinks.
- Exercise >1 hour ingesting CHO with fluid (4-8%) improves performance

Post-exercise nutrition goals
- Depletion of glycogen stores during exercise stimulates regeneration immediately following exercise
- Crucial if subsequent training/races will occur within 24 hours
- Aim: 1g CHO/kg BM immediately & at 2 hours post exercise or until normal meal pattern resumes
  - Electrolyte drink = easily consumed & good immediate source of energy
  - Snacks (banana, cereal bars & sandwiches) to ensure immediate food supply.

Hydration
- Body made up of about 70% water
- Ensures body can effectively maintain temperature without compromising performance.
- Thirst is NOT a good indicator of hydration
  - 1% of BW lost before you become thirsty
  - 2% = 10-15% drop in performance

Fluid intake and exercise
- No advantage in being hyperhydrated (excess body water)
- A good hydration plan should include:
  - 300-600ml with pre-race meal
  - 150-300ml/20 minutes until 45mins prior to exercise
  - 200ml of electrolyte every 15-20min during exercise
- Total rehydration post-exercise.
  - Weight lost during exercise represents water therefore 1kg loss is approximately 1l water.
Fluid intake and exercise

- Exercising at moderate intensity < 1 hour: no need to drink fluid or take in energy
- Exercise > 1 hour ingesting CHO with fluid (4-8%) improves performance
- Exercise > 2 hours, drinks should contain sodium

“There are no magic foods!”

- CHO and water are the most important nutrients for athletes
- Never try anything new on race day
- Choose foods low in fibre & fat with low-moderate protein in order to minimise risk of stomach upsets
- Liquid options for a pre-event meal are an alternative option for those who prone to stomach problems during race day.

Good Luck!