

CHAPTER 6

Will my diet get me through the race? Examining fuelling strategies used by runners

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Nutrition can be a challenging part of any training strategy. Having a good nutrition strategy can improve running performance and overall health. To run well and control body weight, a holistic approach is now being encouraged by leading academics and scientists (including Tim Noakes and other practitioners from the American College of Sports Medicine, 2013; Noakes, 2012). Unfortunately, there is an ocean of contradictory and sometimes misleading information available and it can be surprisingly difficult to make choices about how to fuel before, during and after running (Jeukendrup & Killer, 2010). This seems an unexpected comment to make given the amount of research that has been done, but the decision on how best to fuel your running has never been harder to make.

This chapter is a general guide about fuelling strategies. It intentionally steers a route that keeps clear of controversy. If we start getting close to the controversial issues, we will say so. The idea behind this approach is to help make you aware that there are multiple views on the matter and that some caution is needed. The amount of food and drink you will need to consume before, during and after running will depend on how much you weigh (and your body composition), your running experience, your current fitness level, the weather and your personal goals.

Runner's nutrition can be shaped and presented in a variety of formats (i.e. high-carbs intake, high-protein ratios, high-fat and low-carb consumption, Mediterranean diet, etc.). Independently of the choice adopted, a runner training for an event should eat at regular intervals and consume adequate nutrients according to individual goals. "The EatWell Plate" promoted by NHS may be a good starting point for any runner, as it contains healthy food from all food groups (NHS choices, 2011).

<http://www.nhs.uk/Livewell/Goodfood/Pages/eatwell-plate.aspx>



Water

Water is essential for physical health, performance and wellbeing. As a personal trainer, I often see that my clients fail to drink enough water and fluids. Water is needed to help metabolise fat, protein, carbohydrates and other

nutrients. Water is necessary to draw energy from your fat cells stores. Water is the key that unlocks the energy necessary to fuel your running sessions. The amount of water you need to drink depends on many variables, such as: your weight, environmental temperature and your health. Fluid balance is essential to prevent the early onset of fatigue; hydration also can influence your psychological status and other physiological responses during a race (ACSM, 2013).

Electrolyte beverages can help to replace fluids during long runs and aid recovery after long races. During exercise, drink according to thirst and use caution to avoid drinking excessive amounts of fluids (in order to avoid dilutional hyponatraemia, or water poisoning caused by electrolyte disturbance and excess water). Keep a diary of your fluid intake during training and adjust it accordingly before each a race event. Many years ago when I lived in Brazil, my running club told me to drink around 400 mls of fluid per hour as a guideline (drinking that amount is no longer applicable at this point in time of my life as my training schedule is completely different). I have since trained in Italy, Ireland, France, England and other places and I now know the significance of listening to your own body and the importance to take the time to adapt (as one prescription will not cover all climates and health status). There are numerous online hydration calculators and free apps that may help you to decide your individual daily needs.

Useful resources

MyFitnessPal' Nutritional Tracker (Free app)

<http://www.runnersworld.com/tools/hydration-calculator>

<https://www.powerade.com.au/sports-hydration/calculator>

Electrolytes

Minerals and salts that support the control of fluid balance, energy production, muscle contraction, biochemical reactions and the conduction of electrical impulses in the body.

Natural sources: Bananas, seaweed, water, nuts, coconut water, milk and green leafy vegetables.

Carbohydrates

Consume complex carbohydrates for energy. The digestive system converts carbohydrates into glucose (or blood sugar; for immediate usage) any remaining carbohydrates are stored in the liver and muscles as “glycogen” (any remaining excessive amounts are lastly converted and stored as body fat). The body relies on these stocks of glycogen and fat to generate energy to power your miles. Carbohydrates are needed to refill your energy stores and to control homeostasis including brain and cardiac function (Galloway, 2014; Wong *et al.*, 2008). Aim to consume foods with low to medium Glycemic index (GI) and low to medium Glycemic load (GL). For more information, you can download the Nutrition DATA app for free.

A runner may ingest carbs before, during, and after running as this can boost performance and recovery (the amounts needed will depend on your personal goals and health status so it is best to experiment to find out what works best for you; Ormsbee, Bach & Baur, 2014). Whole grains, vegetables and fruits are good sources of complex carbohydrates (your daily calorie consumption should include from 50% to 65% of complex carbohydrates, the amount will depend on your personal circumstances). Sweet potatoes, oatmeal, bread, pasta and rice are good source of complex carbohydrates containing minerals, vitamins and fibre). Processed simple carbs (i.e. sweets, cakes and fizzy drinks) lacks naturally- occurring vitamins, minerals (hence it is called “empty calories”) and wherever possible processed carbs should be

Types of carbs:

Starches (i.e. rice, certain types of vegetables, potatoes, pasta, whole grains, oats, wheat beans and soy).

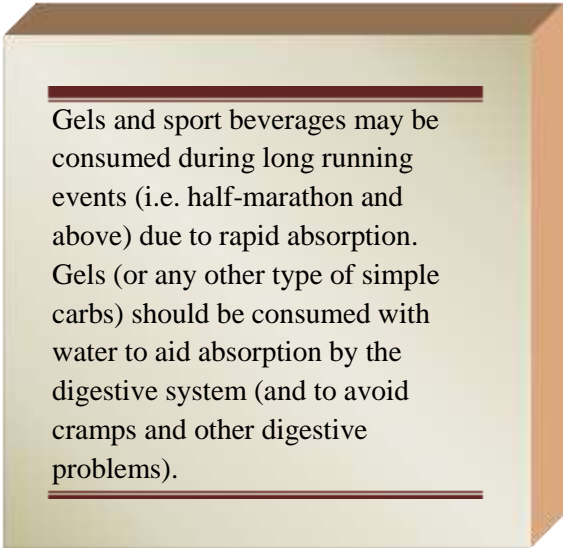
Fibers (i.e. chia seeds, wheat bran and most vegetables such as spinach)

Sugars (i.e. glucose, maltose, fructose, lactose, sucrose).

avoided. There is some controversy surrounding exercise training, running and carbohydrate intake, with supporters of low-carbohydrate/ high-fat intake during training and there are also supporters of high-carbohydrate, high-fat diets for runners (Jeukendrup & Killer, 2010; Galloway, 2014). Whatever approach you adopt should be tested during training and adapted accordingly prior to any event.

Fats

Consume quality fats. Good fats (unsaturated fats) are a good source of energy, important for immune function, hormonal health and needed to the transport of vitamins. Fats from triglycerides (i.e. coconut oil) and omega-3 fatty acids (i.e. salmon) have numerous benefits for health (including running and performance). Omega-3 fatty acids may assist your body to heal faster due to its anti-inflammatory substances. Try adding good sources of fats to juiced or blended juices and use it as an alternative drink during training. Avocados, olives, eggs, almonds, Brazil nuts and seeds are good snack ideas. Processed and saturated fats (such as sweets, cakes, pastries and pies) are linked to poor performance and poor health (i.e. heart disease, high blood pressure) and wherever possible should be avoided.



Gels and sport beverages may be consumed during long running events (i.e. half-marathon and above) due to rapid absorption. Gels (or any other type of simple carbs) should be consumed with water to aid absorption by the digestive system (and to avoid cramps and other digestive problems).

Proteins

Consume quality and natural proteins. Protein is necessary for repair of tendons, recovery of muscles and overall healing. Protein and amino acids are vital for performance and recovery (Galloway, 2014). Not all proteins are created equal; hence, you will need to listen to your body to assess what is best for you. Milk, eggs and beef are a good choice for post running and recovery. Salmon stir-fry with vegetables; Chicken, sweet potato and vegetables are wholesome meal options. Whey protein and milk are also good choices for a pre and post-running snack.

After training refill your energy stores by eating ideally within the first hour (milk, nuts, seeds and yogurt are good sources and generally recommended; Radcliffe, 2011). Carbohydrate and protein intake after exercise can aid recovery, therefore milk, granola bars, whey-protein are good choices, specially as runners may experience lack of appetite that can be caused by exhaustion. A study conducted by Karp et al. (2006) reported that chocolate milk might be an effective recovery drink. Lunn et al. (2012) also reported that fat-free chocolate milk might aid recovery. Other alternatives such as wild salmon, beef, chicken, pasta and vegetables are other good choices that can give your running an extra boost. As a certified Personal Trainer I know there are many other examples of successful strategies, however nutritional advice and prescription should be individualised and whenever possible tailored by a registered dietician or registered sports nutritionist.

The decisions that you make about what you eat and drink before, during and after running should be based on a person-centred approach to “what works for you as an individual” (Galloway, 2014). As a runner, you should maintain a regular diary of what you eat and drink before, during and after each run (alongside notes about how *YOU FEEL*) and adapt it accordingly.

Vitamins and minerals are micronutrients important for performance and good health (bones, transport of nutrients, energy production and electrolytes. Whenever possible vitamins and minerals should originate from food from a balanced diet (i.e. fruits and vegetables) always consult your doctor or a nutrition specialist before taking any vitamin supplements.

<http://www.nhs.uk/Conditions/vitamins-minerals/Pages/vitamins-minerals.aspx>

For virtual help and ideas you may try the following:

<http://www.runengland.org/>

www.calorieking.com

www.fitday.com

<https://www.active.com/fitness/calculators/nutrition>

www.acsm.org

Phone Apps may help you to track your progress and sustain your motivation.

Strava, Zova, Running2Win, Wahoo Fitness, The RunKeeper Pro, Livestrong Calorie Tracker, Dietician-IP, RunCoach, Map my Run, Fitnio, RunGap and FuelMyRun

Online resources are evolving daily and it can be used as a guide to help you to decide what best choice to use to power your running.

General practical tips

1) Eat a variety of wholesome and fresh foods. Think about your food choices as the substances that you consume should be naturally produced and dense with nutritionally packed substances such as vitamins and minerals. Blueberries, bananas, olives, dark vegetables, eggs, milk, Greek yoghurt, fish, oranges, chicken and organic-raised beef are some of the good choices available everywhere. Adequate quantities of good quality macronutrients (proteins, fats and carbohydrates) are necessary to build up your glycogen stores, muscles and to keep your body health and strong. I also encourage runners to include and share a healthy diet with any immediate family and friends (for social support).

2) Avoid processed simple sugar (Meeusen, 2014). Processed simple sugars products (such as cakes, sweets and fizzy drinks) should be acknowledged as a real threat to runner's performance and overall health. Sugar is an acidic compound that can cause insulin sensitivity. Sugar can harvest calcium from bones, increase inflammatory markers and cause damage to all main systems of the human body. To avoid injury and increase your performance you need to stay away from nutritionally-empty simple sugars and processed food.

3) Set genuine short-term and long-term nutritional goals. Cycle your nutrients and keep a diary of your progress. Websites such as www.myfitnesspal.com and Apps such as the Interval Run and Runner's Interval Timer may be a useful alternative to increase your running stamina and speed.

4) Be aware of taking medication when training for a race. Medication, illness and aging can influence the way your body absorbs nutrients from the food that you consume, inform your doctor about your training plans (ACSM, 2013). If you are pregnant, a vegan, a vegetarian or require any special diet (i.e. diabetes, allergies or faith reasons) consult a medical specialist. Your training and nutrition choices may impact your overall health and performance.

5) Ensure you get your required hours of sleep (as it will affect your appetite).

6) Use portion control if you are attempting a weight loss plan. Snack sensibly and try to maintain the recommended safe weight loss rate of 1lb to 2 lbs a week. You may try free apps such as Earthmiles, Careot, Calorie Counter Pro by my Netdiary, WeightPlan (NHS supported weight loss app), Noom Coach, Lose it or MyFitnessPal to calculate your food intake.

7) Keep a diary of your food and fluid intake during training. Apps and interactive wristbands such as Polar loop, Garmin-Vivofit, Fitbit tracker and Jawbone Up may be a good motivational device as you can monitor your training progress, dietary intake and even share your goals and progress online.

Food, performance and mood diary example.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Training							
duration							
Weather							
Food consumed							
Fluid intake							
Mood							
Feelings							

Simple and nutritional snack ideas:

- Dark coloured fruit and vegetables.
- Eggs, sweet potatoes and vegetable soup.
- Vegetables, beans and rice salad.
- Olives, nuts and seeds.
- Caesar Salad (Chicken and lettuce).
- Kale, Chia and coconut blended juice.
- Grilled steak, fish or chicken combined with quinoa.
- Low-fat cottage cheese (good source of casein protein) and salmon.
- Bananas (a good source of potassium and carbs).
- Oatmeal (a good source of soluble fibre and carbohydrates with a sustained energy release).

Nutrition is big business and it can be difficult to distinguish between products. Running can be a physically stressful and demanding activity (Radcliffe, 2011). Good nutrition and adequate recovery should be an important part of your training routine if you want to run longer and faster. The inconvenient truth is that sugar, processed food, alcohol, stress and smoking can hinder your running performance, increase the risk of injury and cause disease. Running regularly alongside consuming adequate amounts of water, fat, proteins, minerals and carbohydrates can improve your health, well-being and running performance (Galloway, 2014; ACSM, 2013).

Case study

Kelsey is a 30-year-old novice runner (2 months experience) and mother of two pre-school children. Start body composition: 1.65m 72 Kg Main goal: weight loss (Total mass loss: 7 kg after 6 months of training).

Kelsey started running with a friend to shed a few pounds. To regain her pre-pregnancy shape Kelsey approached a Personal Trainer for advice. Based on her personal needs, a programme comprised of a mixture of interval training, tempo runs, Fartlek around the local park mixed with yoga, Tabata workout and some weight training was formulated. Tabata interval training can be an easy and interesting way to improve running fitness with fast results as it can improve both aerobic and anaerobic fitness. Yoga was prescribed during the recovery days and absolute rest days were included. Diet plan: Daily breakfast (oatmeal, eggs, low fat yoghurt, etc.), adequately tailored amounts of fresh fruit, vegetables and oily fish (i.e. salmon) during lunch and dinner. Moderate amounts of meat, processed foods and starch carbs (bread, pasta and potatoes) around 2 Litres of water daily (no sugary drinks and minimum caffeine and alcohol intake). In Kelsey's story, adding a mixture of exercise and regular running to a healthy eating strategy helped to improve muscle tone and aided fat loss.

Sample Exercise Plan						
Monday	Tues	Wednesday	Thursday	Friday	Sat	Sunday
40-60 min tempo run or 20 min HITT	Rest	Tabata session or weight training session	Yoga, Pilates Or Swim	Hill Or Fartlek Session	Long run	Rest

Example of runner's diet: Paula Radcliffe, Nutritionist Zoe Harcombe commented that Paula's sample diet presented a practical balance of carbohydrates, protein and fats. <http://www.dailymail.co.uk/femail/article-2007073/Marathon-runner-Paula-Radcliffe-sets-winning-example.html>

Breakfast

8 am -Toast, honey and black coffee

Brunch (after training)

Bowl of cereal with 1 chopped banana and almond milk

Toast with almond butter

Apple juice

Poached egg

Lunch

1pm- Avocado sandwich or sardines on toast

Other lunch examples included tuna sandwich or beans on toast

Sacks: Nuts, apple or nectarine

Dinner

Fish curry - Soya yogurt and fruit.

Steve Way

Steve recently shared his inspirational journey and how he went from an overweight smoker to a marathon runner (recently selected to represent England at the Commonwealth Games after successfully running the London marathon). Steve recently shared his diet tips with the public and explained that one of his strategies is to use a combination of carb depletion meals with a more traditional carb loading approach.

An example of Steve's diet during the carb depletion phase (<http://www.steveway.co.uk/?p=990>)

Lunch

- Pre-cooked roast chicken (skin on), prawns and "fatty" dip and a green salad

Evening meals

- Steak with "Avocado, Pine nuts and cheese salad"
- Omelette with "Avocado, Pine nuts and cheese salad"
- Mexican Tacos without the Taco Shells (Plate of mince, cheese, tomato, lettuce, crème-fraiche and salsa)
- <http://www.steveway.co.uk/?p=976>

Example of the standard carb loading routine used by Steve

- Around 700g of carbs daily (3 days).
- Porridge
- Malt Loaf (Normal and Banana)
- Bagels with Strawberry Jam (No spread)
- Pasta or Rice Dish Evening Meal

Commentary

Andrew M. Lane

Taking on drink or eating a gel is a way runners can boost, or prevent speed deteriorating. Many runners have powerful and persuasive stories of times when they took product X or product Y and it revitalised their performance or made them feel fully energised. Many runners have powerful beliefs that following one diet over another is key to success. Research has shown that if you have a strong belief that something will work, it has a powerful effect on whether it will work or not. What this can lead to is developing strong beliefs that you need to take lots of product X in order to perform extremely well. In the late 1980s when I started competing in triathlon, athletes took a product called L-carnitine, and espoused convincing arguments that it helped them perform better. Younger readers are thinking "L...what?" because the product has not stood the test of time; something that is likely to be saying that lots of athletes used it and not all of them received positive effects. It also might say that other products came along and offered equally or more persuasive arguments. The power of marketing information on what works and what does not should not be underestimated.

In this chapter, Marcia Blake provides information on what nutrients do and offers practical suggestions on how to manage diet. Many clients talk to me about their diet and speak in terms of being passive in the process rather than active. It's worth remembering that it is you who puts the food in, chews the food and swallows and then makes the choice to put the next piece of food in. I realise that this oversimplifies matters and ignores a vast number of competing forces that make you feel that the decision is out of your control, but I cannot emphasise the importance of recognising that you do have a choice.

References

- American College of Sports Medicine (Ed.). (2013). *ACSM's health-related physical fitness assessment manual*. 4th ed. Lippincott Williams & Wilkins.
- Galloway, J. (2014) *Nutrition for Runners*. Meyer & Meyer Verlag.
- Jeukendrup, A.,E., & Killer, S.C. (2010). The myths surrounding pre-exercise carbohydrate feeding. *Annals of Nutrition and Metabolism*, 57 (Suppl. 2), 18–25.
- Karp, J. R., Johnston, J. D., Tecklenburg, S., Mickleborough, T. D., Fly, A. D., & Stager, J. M. (2006). Chocolate milk as a post-exercise recovery aid. *International Journal of Sport Nutrition & Exercise Metabolism*, 16, 78-91.
- Lunn, W. R., Pasiakos, S. M., Colletto, M. R., Karfonta, K. E., Carbone, J. W., Anderson, J. M., & Rodriguez, N. R. (2012). Chocolate milk and endurance exercise recovery: protein balance, glycogen, and performance. *Medicine and Science in Sports and Exercise*, 44, 682-691.
- Meeusen, R. (2014). Exercise, Nutrition and the Brain. *Sports Medicine*, 44(1), 47-56.
- Noakes, T. (2012) *Challenging beliefs*. Cape Town: Zebra Press.
- Ormsbee, M. J., Bach, C. W., & Baur, D. A. (2014). Pre-Exercise Nutrition: The Role of Macronutrients, Modified Starches and Supplements on Metabolism and Endurance Performance. *Nutrients*, 6, 1782-1808.
- Radcliff, P. (2011) *How to run*. Sydney: Simon and Schuster.
- Tokmakidis, S.P., & Karamanolis, I. A. (2008). Effects of carbohydrate ingestion 15 min before exercise on endurance running capacity. *Applied Physiology Nutrition and Metabolism*, 33, 441–449.
- Wong, S.H.S., Siu, P.M., Lok, A., Chen, Y.J., Morris, J., & Lam, C. W.(2008). Effect of the glycaemic index of pre-exercise carbohydrate meals on running performance. *European Journal of Sports Sciences*, 8, 23–33.

