The Basics

Q. Is diet really important for a swimmer?

A. A balanced, varied diet will help to achieve their swimming potential

How??

All swimmers need to ensure that they:

- ☑ Have the correct amount of energy for growth and development
- ☑ Have the right foods to build and maintain strong bones
- ☑ Need to be fit and healthy and not ill as much of the time as possible
- ☑ Need to recover as quickly as possible
- ☑ Have the ability to get to and maintain an appropriate weight
- ☑ Be able to concentrate on training and school/work

In other words food and fluids will affect swimmers on a daily basis and shouldn't be left to chance

E - Energy –from carbohydrate foods
A - Attitude – a positive attitude towards food choice is essential
T - Tasty – taste is important, always try to make food tasty

W - Water is essential for life and for swimming
E – Enjoying food means you look forward to it
L – Little and often is the best way too stay energised
L – Lots of fruits and vegetables benefits the immune system

S – Spending time planning means nothing is left to chance
W – Worrying about food should be a thing of the past
I – Invest in good quality food not cheap convenient food
M – Make breakfast an essential part of the day

W – Water bottles need cleaning regularly
E – Energise to survive the rigours of long hours training
L – Learn to rustle up some quick, tasty meals
L – Lastly enjoy the occasional treat – everyone deserves it

Q. Is Carbohydrate all a swimmer needs to increase in the diet?

A. No swimmers need to eat to be healthy. Poor health will impair fitness. Although carbohydrate foods provide the right fuel for swimming, everyone needs to have the correct balance of all the nutrients and that means choosing from a variety of foods

To have variety in the diet base meal choices around the Balance of Good Health

- Eat at least 5 portions of fruit and vegetables per day (best combination is 3 vegetables and 2 fruit)

- Base meals around starchy, wholegrain (preferably) carbohydrates

- Eat 2-3 portions of meat or alternatives daily
- Eat 2-3 portions of milk and dairy products daily
- Have a low saturated fat intake but include essential fats – Like the oils in fish

Q. Low fat, omega3 fats, essential fats, trans fats. How do these things affect a swimmer?

A. Generally swimmers, like everyone, need to reduce their total intake of fat, particularly saturated fat such as butter, fatty meats, and fats in processed foods. Trans fats are produced when food is processed and hydrogenation takes place. Foods such as cakes, biscuits, margarines, pastries all contain trans fats – check the label for hydrogenated fats and avoid. Swimmers should aim to get most of their energy from carbohydrate foods in order to help their performance. However this does not mean cutting fat out all together. Fat contains essential fatty acids and fat soluble vitamins, in particular A, D and E (important sources of antioxidant nutrients which help combat damage to cells after intense training. Foods rich in these essential fats and vitamins include oily fish (sardines, herring, mackerel, pilchards, salmon, fresh tuna) avocados, seeds, nuts and oils (rapeseed, soyabean and linseed) These should be included in the diet but caution should be observed if a swimmer is trying to reduce body fat levels. Omega 3 fats are also found in these foods and are important in overall health.

Nowadays there are a variety of foods with added omega 3 – milk, bread, eggs, and yoghurts that will all contribute to the diet in smaller amounts.

Q. My daughter has cut out all fat in her diet in order to swim better. Is this OK?

A. No! Cutting out fat or having a very low fat diet, whether to aid performance or lose weight will leave a swimmer deficient in a variety of nutrients and lead to several health problems, not least dry flaky skin and cold sensitivity.

Q. Can you get all the necessary vitamins from the diet or does someone who is training intensively need extra?

A. In theory all well planned and balanced diets will provide all the vitamins and minerals needed (see Q. Is carbohydrate all a swimmer needs to increase in the diet?)

This should include a variety of foods from all the food groups, in particular the fruit and vegetables group. Training regularly means a swimmer needs to eat in accordance to their appetite and often means eating more than the non-swimming members of the family. Automatically a swimmer will achieve a higher vitamin and mineral intake, provided they are not simply filling up on non-nutritious fatty, sugary foods, which contain very few vitamins or minerals

However if a swimmer has not planned or balanced their diet well, their intake may be low. Many studies have shown that low intakes can adversely affect performance, but also that vitamin and mineral supplements taken in excess of requirements will not necessarily produce an improvement in performance. More does not necessarily mean better!

Performance Foods

Q. How much carbohydrate does a swimmer need?

A. The generic recommendation for swimmers is to consume 6-7g carbohydrate per kilogram (kg) of body weight (up to 8-10g of carbohydrate per kg per day if training two or three times a day). Individual consultations will provide specific requirements for the swimmer based on their training load.
This regime needs to be followed on a daily basis otherwise the stores of carbohydrate in the muscles (glycogen muscle stores) will become low and this is when fatigue sets in. Rather than worry about counting every gram of carbohydrate every day the best way to ensure a high carbohydrate intake is to base all meals and snacks around carbohydrate foods (breads, potatoes, rice, pasta, cous cous etc) Carbohydrates are also found in other foods such as fruit juice, bananas, milk, yoghurts, preserves, baked beans, dried fruit.

Q. What are the best foods to eat before training/competing?

A. The pre training/event meal should be eaten 2-4 hours beforehand * and should be low fat, high carbohydrate and lowish in fibre. It should be reasonably filling but not cause any discomfort during the training/race from over filling or gastrointestinal upset, and should include some fluid. Most importantly, the meal should be familiar. This will mean different foods depending on the race time, and the swimmer's likes and dislikes. If the race is very early opt to have a lighter snack on the morning of competition, 1-2 hours prior to the event, and a larger supper the night before. Pre-event meal ideas include:

- Breakfast cereal, low fat milk with fresh/canned fruit
- English muffins or crumpets + jam/honey
- Pancakes + syrup
- Toast + baked beans and flavoured low fat milk
- Baked potatoes with low-fat filling e.g. tuna and sweetcorn
- Creamed rice made with low fat milk, or tinned low fat rice pudding
- Spaghetti with tomato or low fat sauce
- Rolls or sandwiches with banana/jam filling and fruit juice
- Fruit salad plus low fat yoghurt
- Commercial liquid complete meal

*Before early morning training it is advisable to eat and/or drink some form of carbohydrate to sustain the training. As this may be very early and swimmers find it hard to eat at this time it is important to have had a substantial high carbohydrate evening meal and something like a cereal breakfast bar and low fat milk or fruit smoothie on waking

Q. How much and what type of recovery snack foods should a swimmer be eating after training and competing?

A. In general a swimmer should aim for a recovery snack of 1g carbohydrate per kg of body weight within 2 hours after training or competing (preferably as soon as possible). Research has shown that this helps the muscle recover by storing more glycogen more quickly. This is essential in order to be ready for the next training session. Snacks should be high carbohydrate, low fat and nutritious

(See box – suitable snacks)

Whether the carbohydrate is in a liquid form (isotonic sports drink/milkshake) or solid (teacake/chewy bar) is individual choice depending on how the swimmer feels after the session, the temperature (solid form is often preferred after early morning sessions in the winter, whereas cold sports drinks work better for swimmers in the summer). Research has shown that foods with a high glycaemic index such as sports drinks, bananas, pasta dishes help the recovery process

Newer research is suggesting that some protein as well as carbohydrate after exercise is best to promote recovery especially if the training session involved strength training. It is suggested that for every 50g of carbohydrate, the snack should provide at least 10g of protein. This could be as a milkshake (see recipe) or a bowl of cereal with milk, a round of sandwiches or a filled roll plus a piece of fruit, 1/2 tin baked beans on 2 slices toast. If you know the food is poor or non-existent at the venue it is important to take snacks along to help start the recovery process and to curb hunger until good food is available.

Q. How can a swimmer fuel up for multiple races on the same day?

A. On competition days timing of meals and snacks are vitally important.

- Less than 1-hour use sports drinks, as these will be easily and quickly absorbed.
- Between 1-3 hours small snacks such as bananas, raisin breads and sports drinks are suitable.
- Over 3 hours small light meals such as toast, chicken or ham sandwich and fluid help with hunger and give a good source of carbohydrates.
- Sometimes liquids such as fruit smoothies are the only acceptable source of fuel due to nerves.
- On competition day it is good to remember that whatever is chosen should be tried and tested.

Examples of a High Carbohydrate, High Energy Eating Plan

MEAL	1	2
Breakfast	Large bowl of cereal/muesli ½ pint semi skimmed milk add a handful of raisins and chopped banana	Smoothie (bought or homemade) Blend ½ pint semi skimmed milk, 1 ripe banana, 1 teaspoon honey,

	Glass of fruit juice	1 low fat yoghurt 1 toasted teacake with jam Glass of fruit juice
Post training snack (am)	Bagel or muffin Small smoothie	Chewy bar (1-2) Carton of semi skimmed milk
Lunch	Jacket potato with baked beans, tuna & little grated cheese Muller rice type dessert Banana	Large baguette/panini with cooked chicken, sweetcorn, peppers 2 large slices malt loaf with low fat spread Dried fruit and nuts
Pre training snack	Isotonic sports drink	Fruit and fruit squash
Post training snack (pm)	Large bread roll with meat/chicken	Toast (1-2) Banana Raisins
Evening Meal	Pork stir fry with noodles or cous cous or rice Add mixed peppers, sweetcorn, courgettes etc Plain sponge cake, syrup, fresh or tinned fruit and low fat yoghurt	2 egg omelette, Grilled potato waffles and tomatoes and mushrooms, baked beans, Large salad Rice pudding with raisins
Supper	Milky drink with a toasted teacake	2 slices toast with marmite

Q. Should a swimmer eat more protein to increase muscle mass?

A. Yes, but only if the coach has advised training sessions involving lifting heavy weights and this does not necessarily mean protein intake has to increase. It depends on how much protein is normally being consumed. For heavy weight training, eating 1.2-2.0g of protein per kg of body weight per day is frequently recommended, plus enough calories (energy) to prevent protein being used as a fuel. Unless enough food is eaten to supply energy, any protein eaten will be burned as fuel instead of being made into muscle. The upper end of 2g protein per kilo of bodyweight is for extreme exercise loads (as seen if strength training 3 times a day). Most people in this country already eat protein at the upper range.

Some swimmers sometimes concentrate on carbohydrates and do not include enough protein in their diet (e.g. toast and jam, pasta with tomato sauce, baked potato). While carbohydrates are very important, insufficient protein or poor dietary planning can result in a feeling of hunger despite a pile of pasta (protein has a filling effect, more so than carbohydrates) and your immune system may suffer.

Q. Is excess protein harmful?

A. No, not unless your kidneys are not working properly. However, eating large portions of protein foods or protein supplements at the expense of carbohydrate foods is a waste of money and will not improve performance or build muscles. What will happen is that insufficient carbohydrates will be eaten as the swimmer fills up on excessive proteins. Excess protein is not stored, but can be converted to fat. Protein supplements can result in a Vitamin B6 imbalance and may affect calcium balance within the body.

Tip
To get a cheap, nutritious, convenient way of getting some protein and carbohydrate without cooking try a milk based smoothie or a commercially available liquid complete meal

Q. Will being vegetarian affect a swimmer's performance?

A. No, as long as the overall balance and variety of the diet meets all the requirements for health and swimming performance. A vegetarian diet is often high in carbohydrate as more grains, pulses and beans, fruits and vegetables are consumed. Care should be taken to include protein sources at all meals. Many recipes for high carbohydrate dishes such as spaghetti Bolognese, cottage pie can be used by substituting the meat with quorn or soya and tofu can be used instead of chicken in stir fries. A vegetarian needs to mix sources of non animal proteins to get the best combination of amino acids. These include porridge and milk, red kidney beans and rice, peanut butter sandwich, lentil soup and bread roll, breakfast cereal and milk.

Q. Why is hydration so important to performance?

A. The human body is 60% water. During exercise some of this essential water is lost as sweat; therefore extra fluids must be drunk to replace it. If a swimmer fails to replace the losses, the body may overheat - like a car with a broken radiator! Dehydration is a swimmer's worst enemy! Even mild dehydration reduces strength and stamina. Severe dehydration can even be life threatening. Water should be considered an essential part of healthy eating for performance.

Q. How do I know if I am dehydrated?

A. Firstly, thirst is not a good indicator and the body cannot be trained to get used to dehydration.

The following signs and symptoms are associated with dehydration:

☞ Dizziness Irritability Muscle cramp

☞	Headache	Fatigue	Loss of performance
☞	Weakness	Nausea	Light headedness

Two of the simplest and easiest ways of detecting dehydration include keeping a daily weight check (using reliable scales) and checking on urine colour. As dehydration develops, the urine colour becomes more yellow and darker and the volume and frequency of urination decreases. The "pee test" is a simple colour chart, which allows a swimmer to monitor the colour of their urine and therefore their level of dehydration

Well hydrated swimmer	Dehydrated swimmer
Go to the toilet frequently	Go to the toilet infrequently
Urine will be pale in colour	Dark yellow in colour
Pass a reasonable volume	Pass only small volumes

However be aware that some multivitamin supplements can make the urine more yellow in colour. Beetroot also affects the colour and certain medications.

Q. How do you measure how much you sweat?

A. Weighing at the start and finish of a training session and taking into account the amount of fluid drunk can estimate reasonably accurately how much sweat has been lost during that particular session.

Example of how to estimate sweat loss during a training session

Weight before training (in swim suit)	60kg
Weight after session	59kg
Weight loss	1kg
Weight (volume equivalent) of fluid drunk during session	1kg (1000ml)
Duration of session	120 mins
Total sweat loss (Weight loss + fluid drunk)	1 kg + 1kg = 2 kg
Divided by time (2 hours)	1kg (1 litre or 1000ml)

This swimmer sweated out 1 kg or 1 litre per hour and therefore needed to drink 2 litres of fluid for that 2 hour particular training session to remain hydrated. In practice most swimmers carry on sweating after they finish their session so may need to take more fluid on board to account for this.
This will vary as the conditions i.e. intensity and ambient temperature of each session changes.

Q. What is the difference between sports drinks, energy drinks and sports waters?

A. Sports drinks are formulated to help fluid intake and optimise performance by providing the best combination of fluid and carbohydrate fuel for most athletes. Carbohydrate and water are rapidly absorbed from the small intestine when the concentration of the sports drinks is less than 10% (isotonic sports drinks are usually between 4-8%). Above 10% absorption slows down. Glucose, fructose and glucose polymers are the best forms of carbohydrate although small amounts of fructose have been shown to improve taste. Isotonic sports drinks contain a small amount of sodium to stimulate both the absorption of carbohydrate and water and to increase the desire to drink. Most contain between 10-25mmol of sodium per litre.

Make your own 4-8% carbohydrate drink:

- 150-200 ml ordinary diluted squash concentrate or High Juice (any flavour)
  800-850 ml tap water
  Small pinch salt (1/5 teaspoon)
  (NB the precise amounts will vary depending on the carbohydrate content of the various brands of squash - aim to achieve a drink containing 4-8 g carbohydrate per 100 ml of added water)

- 50 g glucose polymer e.g. 'Maxim'
  1000 ml tap water
  Small pinch salt (1/5 teaspoon)
  Sugar free squash to flavour

- 500 ml fruit juice drink (the word drink is important as it means it has added sucrose as well as fructose – this is a good combination)
  500 ml tap water
  Small pinch salt (1/5 teaspoon)

- 500ml unsweetened fruit juice (pineapple, orange or grapefruit)
  500ml water
  Small pinch salt (1/5 teaspoon)

Energy drinks have been marketed to boost performance. The carbohydrate content is usually too high to help swimmers before, during or after training or competing, as the higher level of carbohydrate will compromise fluid absorption. Some have stimulants like caffeine added and tend to be carbonated.

Sports waters are low carbohydrate drinks often made with purified water and some have added vitamins, minerals and electrolytes added. They are not the best choice for swimmers but can be used for short-ish low intensity sessions where sweat loss is low.

Q. Is it necessary to have extra salt if a swimmer sweats a lot?

A. No, unless a swimmer is training very intensely in a very hot climate. A normal healthy diet would adequately cover the body's salt needs after exercise.

Nutritional Issues

Q. How can a swimmer boost their immune system to prevent illness?

A. Hard training is associated with reduced immune function. This is more so when combined with a poor diet. Swimmers are more prone to illness if their diet is lacking in energy (particularly carbohydrate), protein, iron and zinc and vitamins A, E and some B vitamins. Mega dosing with vitamins and minerals does not seem to be beneficial. The answer is to have a well balanced diet all year round.

Q. How can a swimmer boost their iron intake?

A. There are two types of iron found in food. Haem iron is found in animal-derived foods and is well absorbed by the body. Non-haem iron is found in plant foods and is absorbed poorly. The absorption of non-haem iron can be improved by combining non-haem foods with sources of haem iron. Good sources of haem iron are lean red meat, chicken, fish and liver or liver pâté. The largest amounts of non-haem iron are found in eggs, fortified breakfast cereal, wholemeal bread, spinach, legumes, dried fruit and nuts. To improve iron intake and absorption:
Include lean red meat in your meals 3-5 times each week. It's as easy as adding a slice of roast beef to a sandwich or a handful of pork strips to a stir fry.

- Use commercial breakfast cereals that have been fortified with iron. The label will tell you if iron has been added.
- Add a source of vitamin C to your meals. This helps improve the absorption of iron. Good sources of vitamin C include fruit, juice, and vegetables such as peppers and tomatoes.
- Avoid tea and coffee immediately before and after meals. These substances inhibit the absorption of iron.

Q. What is the best way to lose weight?

A. It is all about energy balance (food and drink consumed should be less than energy expended through training)

- By checking out the foods eaten cut out the excess high fat ones such as cream, high fat margarine, crisps, chocolate, high fat cheese and fatty meats, cakes, pastries etc
- Eat the good fats in moderation (oily fish, seeds, nuts, vegetable oils)
- Ditch all non nutritious foods – sugary squashes, soft drinks
- Only eat low energy recovery snacks such as fruit, low fat yoghurts
- Reduce portion sizes at meals but still eat a variety of foods

Q. **How do you lose weight when you are in heavy training without getting tired from having a lower energy intake?**

A. Some level of tiredness is expected when in energy deficit however the effect can be minimised by adopting a balanced, long-term approach to weight loss. It helps to choose an appropriate time to focus on weight loss. For example, well before a major competition. It is also important to adopt a realistic, long-term approach, which involves moderate, gradual changes rather than a large, sudden reduction in energy intake. Consuming a balanced food intake can reduce tiredness.

- Eat enough nutrient-dense carbohydrate (fruit, vegetables, and cereals, low fat dairy products) to fuel your training sessions.
- Eat enough protein to minimise loss of muscle.
- Reduce energy intake by targeting excess calories from sources such as fat and non-nutritious carbohydrate (lollies, soft drink, biscuits, ice cream etc).
- Clever timing of your food intake will also help to minimise tiredness. For example, a snack immediately after a training session is more effective than a snack late at night.
- Make a list of foods and drinks to identify calories, which can be cut i.e. is the sugary squash really necessary at mealtimes or will water do?