

# Nutritional and Dietary Advice For Fareham Nomads Swimming Club



Nutritional and Dietary Advice for Swimmers

### **What to eat and when to eat it**

The timing of the meals you consume is important. On the day of a Competition the intake of fat and protein should be reduced, as these nutrients require a relatively long time to be digested. Plan to have your pre- competition meal 3-4 hours before the competition.

#### **Your pre- swim competition meal should be:**

- High in carbohydrate, lower in fat, low in protein, low in fibre
- Not too bulky, and easy to digest
- Don't try new foods pre match

#### **Consume foods such as:**

- Breakfast cereal with low fat milk
- Porridge with banana
- Wholegrain Toast or rye bread with jam/honey
- Granary sandwiches with banana/honey/jam
- Pasta/rice with low fat sauce eg: rice and millet pasta with pesto
- Whole bran muffins, crumpets, bagels
- Baked potato, potato farl's
- Fruit and orange juice
- Energy bars, oat cakes, rice cakes

Snack high in carbohydrate may be eaten about 2 hours before the first race, however the time reference is only a guideline as there are great individual differences in the ability to digest food. It is a good idea for you to experiment with a variation of foods at different times before training sessions. You need to make sure you take adequate food with you for multiple heats and races for one competition day.

### **Training Diet**

Carbohydrate wholegrain rich foods must be the main source of your diet. Table 1 lists foods, which contain a lot of carbohydrate. You should aim to consume the main bulk of your diet from complex carbohydrates (approx 70%).

Simple carbohydrates should not be consumed in large quantities and are more useful as snacks between swim sessions, or to top up your energy intake.

The carbohydrate you consume should be balanced with a healthy intake of protein, low fat and plenty of fruit and vegetables.

**Table 1 Carbohydrate-Rich Foods**

Complex Carbohydrates	Simple Carbohydrates	Mixture of Complex and Simple Carbohydrates
Bread	Sugar	Cakes
Pasta	Jam	Biscuits
Rice	Honey	Puddings
Noodles	Yoghurt	Sweet Pastries
Oats	Fromage Frais	Cheesecake
Breakfast Cereals (unsweetened)	Ice Cream	Breakfast Cereals (sweetened)
Pulses (beans, lentils, peas)	Jelly	Bananas
Baked Beans	Raisins	Grapes
Apricots, Peaches	Full sugar cordials	Oranges
Potatoes	Jelly sweets	
Parsnips, sweetcorn	Soft drinks (Lucozade, sprite, energy drinks)	

If you do not consume enough Carbohydrate (kcal/energy), then you will not have enough energy to complete the competition day (or heavy swim training) and subsequently your performance will suffer, and more importantly you will be more susceptible to injury. Up to 70% of the diet should consist of wholegrain carbohydrate sources (individual variation, dependant on training frequency and duration)

### Timing of Meals and Snacks around Swimming Training Sessions

As swimmers you are required to train sometimes twice a day for several hours a time some or all of the time, recovery from one swim session to the next is crucial. Swimmers need to plan their daily food intake to ensure regular snacks and meals are consumed around swim sessions. It's important to have nutritious carbohydrate snacks on hand immediately after training to initiate the refuelling process. Many nutritious carbohydrate foods contain a small amount of protein which aides in the repair of regenerating proteins used in fuel metabolism and muscle damage incurred during exercise.

### Healthy Snacking

Of course, as a swimmer you need other nutrients too and it's not easy to get the perfect intake of carbohydrate from eating a regular three meals a day. The way to do it is by snacking - snacks play a crucial role in your diet especially if eaten immediately after training or on competition day. That's when the Energy stores in the muscles which have just been working are best refueled.

### **Snack Attack! These snacks are high in carbohydrate but low in fat and should be consumed for a healthy training diet**

- Banana, honey sandwiches
- Muesli bars, unsalted popcorn, pretzels
- Malt loaf, whole meal currant buns, oat bars
- Crumpets, bagels, English muffins, scotch pancakes
- Wholegrain cereal bars (oats, bran etc)
- Low fat rice pudding, rice cakes
- Yoghurts and milkshakes, Soya yoghurt pots
- Wholemeal wraps with humus, Wholemeal crackers

- Fruit and dried fruit (avoid added hydrogenated fats)

### **Fluids- Hydration**

Even though you are in water you still can become dehydrated as a swimmer. As little as 2% dehydration within the body can impair swimming performance. You need to ensure you drink enough water and electrolyte solution. Generally, try and take regular sips at every opportunity during training and competition day.

The water lost from the body during sweating needs to be replaced to stop you getting tired quickly, and also speed up the recovery process that means feeling fitter and sharper afterwards a lot sooner.

### **What's best to drink?**

For swimmers the best fluid to drink is:

- Diluted carbohydrate/electrolyte solution. In plain English, that's the kind of stuff you'll find in stuff like Isostar, Science in Sport (SIS Go electrode drink) and Gatorade. However it is easy to make up your own Isotonic Sports Drink (see the internet and FNESC Web Site for further information).

### **When should I drink?**

Ideally, it's best to drink before, during and after a swim session, as well as drinking frequently during a gala/open meet. Keep a drinks bottle by the pool be sure not to over hydrate by gulping and take small frequent sips every 15 minutes. Gulping large volumes of fluid will result in gastro- intestinal stress and potential stitch,

### **How much should I drink?**

Only a little – but often. If you drink too much too quickly, you run the risk of getting a stomach upset and stitches. Sip throughout the day as well as during training.

**Daily fluid requirements** are estimated as 35mls per kilogram of body weight (kg). Most swimmers will require between 2- 3 litres a day, which does not include the fluid lost as sweat during exercise. Hourly fluid requirements are calculated by dividing total daily requirement by 24.

Example: Fluid requirements = body weight (60kg) x 35 = 2100mls ÷ 24 = 90mls

This calculation can be used to gauge fluid intake over a number of hours e.g. 500mls over a 5-hour period, 700mls required to cover an 8-hour sleep period etc. It is a useful guide to promote regular fluid intake throughout the day to maximize absorption.

**Pre training or competition** It is important to start each swim session fully hydrated.

- Drink at least 300 – 600mls with the pre-event meal. Choose water, diluted squash or diluted sports drink
- Continue to drink 150 – 300mls every 20mins up to about 45 minutes to 1 hour before the competition, to allow time for a toilet stop
- Drink 250 – 350mls fluid immediately before swimming session starts

**During training or competition** Drinking during swimming provides water and electrolytes to replace sweat losses, and can also give a source of carbohydrate to boost available energy for the muscles.

- Fluids should be full or half strength isotonic drink according to preference you choose to drink water; a sachet of carbohydrate gel with water should be taken before the start of the swim session

- During competitions each swimmer should have 2 fluid bottles, each labeled with number. One bottle should be kept at the side of the pool and the other at the nearest point by the pool and your kit bag. These bottles may need replacing if the competition lasts over several hours.
- Begin drinking early on competition day
- Use every opportunity to drink throughout day especially if you have to qualify for heats then the actual race.

**After training or competition** Replacement of body water and electrolytes after exercise is essential when repeated bouts of swimming are planned within a limited timescale. You have to work hard to take enough fluids to fully rehydrate, especially when swimming in the heat. Don't rely on being thirsty as a sign to drink.

Weight change monitoring (body weight before minus body weight after) provides a guide to fluid needs – a loss of 1kg equals a loss of 1 litre for sweat.

- Start rehydrating immediately after swimming with full or half strength isotonic drink. A fluid that contains some sodium (salt) and carbohydrate provide faster body water replacement than plain water and is more palatable
- Remember that you will continue to lose fluid during recovery through urine losses and ongoing sweating
- Drink according to a plan
- Caffeine containing drinks and alcohols are not good rehydration drinks as they can increase urine losses

#### **Quick hydration checks:**

- Weight – 1kg of weight lost during a swim session is equal to 1 litre of fluid lost.
- The 'urine test' – If your urine is dark colored, it means you need to have a drink. Lots of trips to the toilet, producing lots of clear colored urine, shows you've taken on enough fluid.
- Thirst – Being thirsty is an unreliable indicator of when you need to have a drink. If you're thirsty, you're actually already partly dehydrated so if you finish a swim session and you're gasping it's a giveaway you haven't taken enough fluid on board.

#### **Sports Drinks**

- Sports drinks are likely to promote better fluid intake than water.
- Sports drinks increase retention of fluid consumed post-exercise by reducing urine losses.
- Sports drinks provide an additional source of fuel that may enhance performance and reduce immune stresses.
- In situations in which these benefits do not occur, sports drinks do not detract from performance compared to water.
- Powdered sports drinks can be made up in different concentrations to change the relative delivery of fluid and carbohydrate. For example, a more concentrated drink may be useful when intake of fuel has priority over hydration (e.g. Swimming in a cold environment when sweat losses are small), and a more dilute drink may be useful when fluid replacement is critical.
- Dehydration increases the risk of gastrointestinal problems during exercise and is often the cause of complaints that 'the sports drink made me sick'. Swimmers need to drink earlier to prevent dehydration rather than wait until a substantial fluid deficit has occurred.

Practicing fluid intake strategies in swim training can also help to overcome problems such as dislike of the taste or mouthfeel of the drink, or gastrointestinal discomfort associated with use of sports drinks.

### **Diet and Recovery after a swimming competition**

Here are 4 tips to help you recover from a hard day's competition or heavy swim session.

1. Rest, and make sure you have enough sleep.
2. Eat protein rich foods to help repair muscle damage
3. Replace your body carbohydrate stores by eating carbohydrate-rich foods within two hours after a swim session.
4. Drink plenty of fluids to replace those lost through sweat.

Once the competition is over, fluids should be replaced and carbohydrate should be consumed as soon as possible to promote recovery of glycogen stores (**WITHIN 20 MINUTES**). During the cool down you should consume fluids and small snacks, such as dried fruit, for Goodness Shakes. As soon as possible you should aim to consume a meal which is high in carbohydrates with some protein.

#### **Foods such as:**

- Wheat free pasta, spaghetti, rice, noodles, low fat pasta sauce with protein topping, chickpeas, lentils, lean mince,
- Bread with protein filling such as tuna, chicken, turkey, baked beans, poached egg
- Rice cakes with peanut butter
- Grilled fish with sweet potato mash and vegetables

### **Daily Recovery**

Routine training loads for swimmers increases daily energy (kilojoule), carbohydrate and protein requirements. Many swimmers in the past have focused exclusively on replacing carbohydrate at the expense of other nutrients such as protein. It is important for swimmers to ensure meals and snacks are based around nutritious carbohydrate foods to meet daily fuel and nutrient demands. Persistent fatigue, poor recovery, illness, and unwanted weight loss are common symptoms amongst swimmers who fail to adequately meet daily energy and nutrient requirements

### **Why is iron important for a swimmer?**

Iron is required for a number of key functions in the body:

- Iron is an important component of haemoglobin and myoglobin. Haemoglobin transports oxygen in the blood. Myoglobin transports oxygen in the muscles.
- Iron is involved in the electron transport system. This system controls the release of energy from cells.
- Iron is required for red blood cell production.
- Iron is required for a healthy immune system

Inadequate iron in the body can impair aerobic metabolism by decreasing the delivery of oxygen to tissues and reducing the capacity of muscles to use oxygen for the oxidative production of energy.

Due to frequency and duration of the training loads as a swimmer. It can be hard to balance the training volumes and intensities as they can remain high for long periods so ensuring you have enough iron in the diet is very important to carry out this type of training.

Typical symptoms of low iron count:

- Heavy legs, aches and pains
- Feeling excessively tired/ fatigue
- Aches and pains and injury like symptoms
- Injuries that heal slowly

- Poor recovery after sessions/races
- Feeling cold frequently and low immune system( frequent cold and viruses)
- Depression
- Shortness of breath especially within first 10 minutes exercise
- Night sweats

(There are many more common symptoms) If you feel you are suffering from low iron count you need to make an appointment with your GP or sports medicine doctor.

### **Where does iron come from?**

The body is unable to manufacture iron therefore the body's iron needs must be fully supplied by the food we eat. Although iron is widely distributed in foods, some sources are better absorbed than others. The best sources of iron are foods with a high iron content and high iron bioavailability (i.e. are well absorbed).

Iron absorption is best (15-18%) from foods that contain **haem iron**. Red meat, seafood and poultry are the best sources of haem iron.

Iron absorption from foods that contain **non-haem** iron is much lower (<5%). Non-haem iron is predominantly found in plant foods such as cereals, vegetables, legumes and nuts. The absorption of non-haem iron can be improved by combining sources of haem iron with non-haem iron. Including vitamin C-rich foods with meals (e.g. juice or fruit with breakfast, capsicum in a stirfry, salad or fruit with a sandwich) also enhances absorption of non-haem iron.

Some substances in food inhibit the absorption of iron. Excessive intakes of tea, coffee and bran have an inhibitory effect. Consumption of these foods may need to be modified when iron status is poor.

Major contributors of iron in the UK diet are meat, fish, poultry, iron-enriched breakfast cereal and bread. Dried fruit, sweet corn, green leafy vegetables including spinach, watercress, and broccoli are other good sources of iron.

#### **Haem Iron**

<b>Food</b>	<b>Serve</b>	<b>Iron (mg)</b>
Liver	100 g cooked	11.0
Liver pate	40 g (2 Tbsp)	2.0-3.0
Beef	100g cooked	4.0
Chicken	100g cooked	1.2
Fish	100 g cooked	0.6-1.4
Oysters	100g	3.9
Salmon	100g	1.5

#### **Non-haem Iron**

<b>Food</b>	<b>Serve</b>	<b>Iron (mg)</b>
Eggs	100 g (2)	2.0
Breakfast cereal (fortified)	30 g (1 cup)	2.5
Wholemeal bread	60g (2 slices)	1.4
Spinach	145g cooked	4.4
Lentils/kidney beans	100 g cooked	2.5
Tofu	100g	1.9

Sultanas	50g	0.9
Dried apricots	50 g	2.0
Almonds	50 g	2.1

### **Nutritional Considerations for Team Travel**

Traveling away from home for training and competition is standard practice for most swimmers. Unfortunately, the disruptions and distractions of a new environment, changes in schedule and exposure to different foods can significantly affect usual eating habits. Major nutritional challenges faced by swimmers while traveling include:

- Achieving carbohydrate and protein requirements
- Meeting daily vitamin and mineral requirements
- Balancing energy intake(( avoid overeating/under eating)
- Maintaining adequate hydration
- Food safety

It is essential that strategies are put in place to minimise the impact of travel on your food intake. Whether you are travelling overseas or on a long local trip to swimming competition, the key to successful eating while on the move is **planning and preparation**.

### **Will a vegetarian diet improve swimming performance?**

Currently, it is unclear as to whether a vegetarian diet will improve athletic performance. To date, studies have failed to examine the true benefit, if any, of a vegetarian diet on exercise performance. Studies have either controlled for the inherent differences seen between vegetarian diets and non-vegetarian diets, or have used populations that are not representative of well trained athletes. As many studies typically report vegetarians consume a diet higher in carbohydrate than non-vegetarians, further research is required to determine the possible training and competition benefits of following such a diet.

### **Nutrition Tips for vegetarian swimmers**

Be sure to eat a variety of food choices including protein-rich and carbohydrate-rich foods at each meal. Vegetarian sources of protein and minerals typically found in meat include lentils, dried beans and peas (ready-to-use products are available), tofu, tempeh, textured vegetable (or soy) protein, and ready-made nut,

Be sure to include protein rich foods at meals, especially at the midday meal. Many lacto-ovo-vegetarians use cheese as a convenient meat alternative, whereas vegans may fail to use suitable protein alternatives altogether. As a swimmer you may have limited time for meal preparation, particularly at lunch due to large volumes of training. Convenient meat alternatives for lunch include ready-prepared beans (eg. baked beans), nut and seed spreads, such as peanut butter, tahini and almond spread and ready-made luncheon meats, derived from wheat gluten.

- **For the Vegan:** Vitamin B12 deficiency is a concern for strict vegan swimmers. Dairy foods and eggs provide sufficient vitamin B12 for athletes following a lacto-ovo-vegetarian diet. Vegan swimmers should include a known source of vitamin B12 such as fortified soy milks or consider Vitamin B12 supplementation.
- **For the Vegan:** Dietary intake of riboflavin may be limited for vegan swimmers particularly those who avoid consuming soy milk and soy milk products. Rich sources of riboflavin for the vegan

swimmer include fortified breakfast cereals, grains, textured vegetable protein, soy milks, soy yoghurts, soy custards, soy cheeses and yeast extract spreads such as Marmite and Vegemite.

### Alcohol and swimming performance

Alcohol is a depressant drug, not a stimulant as many people think. It slows down activity in the central nervous system, including the brain. Depressants affect concentration and coordination, and slow the response time to unexpected situations.

Alcohol is an ergolytic aid to sports performance. This means that alcohol will detract from, not improve exercise performance. Alcohol intake negatively impacts on a variety of psychomotor skills essential for successful exercise performance, including reaction time, balance and hand-eye coordination. Studies have also shown that drinking alcohol does not improve power, strength or endurance.

It is important to note that alcohol is banned in some sports during competition. Although most athletes do not use alcohol immediately before exercise, consuming alcohol in binges during the week or on weekends, is likely to affect recovery from swimming sessions and swimming performance on subsequent days

### Easy Steps to Improve Your Diet

Here are some easy steps to improve your diet.

- Eat breakfast. This is the most important meal of the day, so it should not be skipped.
- Reduce the amount of coffee, tea and fizzy drinks that you drink, and replace them with water, fruit juice or other healthy drinks.
- Eat healthier snacks. Eat carrots, dry breakfast cereal, nuts, rice cakes, rye, crisp breads, bagels or toast rather than crisps, chocolate bars and sweets.
- Reduce sugary foods, for example by eliminating sugar from tea, coffee and breakfast cereal.
- Reduce your intake of fatty foods. For example, reduce the amount of butter, margarine, fatty meat, beef burgers, chips and crisps that you eat and other processed foods
- Drink plenty of fluids before a match, at half-time and after the match, particularly in hot, humid weather.
- Avoid sugary snacks immediately before the start of a match. Fruit, such as bananas, or other carbohydrate-rich snacks are better.
- Avoid over-eating before a gala.
- Replace fluids, salts and carbohydrates that you have used during the gala or open meet.

### Sources of nutrients and their major roles

Nutrients	Major roles	Sources
<p><b>Carbohydrates</b> Foods high in carbohydrates are commonly divided into two types:</p> <ul style="list-style-type: none"> <li>□ Simple carbohydrates, which tend to be found in highly refined foods.</li> <li>□ Complex carbohydrates, which tend to exist in their natural unrefined state</li> </ul>	<p>Carbohydrates in either form are broken down to glucose in the body and stored as glycogen. The majority is stored in muscles; some is stored in the liver, which is used to raise the level of blood glucose when required and supply the brain and muscles. Great demands are placed on carbohydrate stores during heavy exercise.</p>	<p>Simple (sugar): confectionary, cakes, preserves, soft drinks. Complex (starches): rice, bread, pasta, potatoes, cereals, fruit.</p>
<p><b>Fats</b> Fats can be split into two types:</p> <ul style="list-style-type: none"> <li>□ Saturated fatty acids, which are mainly found in animal fats and are usually solid at room temperature.</li> <li>□ Unsaturated fatty acids, which mainly come from vegetables or fish sources and</li> </ul>	<p>Fats are stored mainly in adipose tissues and some are stored in muscle cells. They contribute to the general health of individuals, their metabolism playing an important role in the production of energy. Some essential fatty acids must form part of any acid.</p>	<p>Butter, margarine, lard, oils, oily fish (mackerel, pilchards, salmon), pasties, cheese, whole milk, nuts, fresh food.</p>

are liquid or soft at room temperature.		
<i>Proteins</i>	Proteins are composed of amino acids, and form an essential component of any diet. They are required for the growth and repair of body tissues, the building blocks of hormones and enzymes. They are also important in the functioning of the immune system.	Milk, cheese, meat, yoghurt, poultry, fish, eggs, nuts, pulses.
<i>Vitamins and minerals.</i>	Vitamins and minerals play an important role in energy metabolism; deficiency of one or more of these micronutrients can impair exercise capacity. Deficiencies, however, are rare in sportspeople. Excessive amounts of some micronutrients may be harmful.	Fruit, vegetables, nuts, fish, meat, eggs, dairy products, cereals.
<i>Fibre</i> (non-digestible vegetables, carbohydrate)	Dietary fibre is a mixture of mainly indigestible substances which are found in plant cells. In the digestive system dietary fibre assists the body to absorb and use nutrients. Deficiencies can result in constipation and gallstones.	Seeds, peas, beans, vegetables, fruits, wholegrain cereals.
<i>Water</i>	Water performs numerous functions and is one of the body's most important nutrients. It acts as the major transport medium in the body and is crucial in the regulation of body temperature and preventing dehydration.	Foods, drinks, formulated sports drinks.
<i>Alcohol</i>	Alcohol may make a major contribution to the total energy intake of a person's diet. However, this energy source cannot be utilized by muscles; it is slowly metabolized by the liver at a constant rate. Excessive amounts are stored as fats.	Alcoholic drinks: beers, wines, etc.