



## Nutrition

A good balanced diet is important for everybody but for an athlete it is even more important. In order for a swimmer to train and compete to their best ability what they eat and drink must be given a lot of consideration. It is important as it allows the swimmer to replace fuel stores, repair and strengthen damaged muscle tissue and replace fluid losses that can occur after exercise.

The main source of energy during training is derived from carbohydrate so high carbohydrate meals and drinks are essential along with the correct timing to provide energy and to ensure a speedy recovery. Present research also suggests that inadequate carbohydrate intake can also contribute to a fall in the immune system, therefore making individuals more susceptible to illness. Tiny muscle fibres get damaged when swimmers are training so hard and need to be healed, and a high carbohydrate, low-fat diet with some protein is the best way to keep their bodies on top form.

Choosing the appropriate foods in suitable amounts at the correct time will not compensate for the lack of natural ability, a reluctance to undertake the required training, nor an absence of tactical awareness. However it is equally clear a poor diet can affect an athlete's potential to train and compete. A good diet will not turn a mediocre athlete into a champion, but a poor diet can turn a champion into a mediocre athlete.

Without getting too scientific, our bodies – specifically our muscles – need fuel, and the only energy source that can power them is ATP (adenosine triphosphate). Our muscles store enough ATP for just a very short time. For back-up, our energy system is supplied by fat, carbohydrates and protein throughout the duration of aerobic exercise. As a swimmer's body struggles to keep up with the demand placed on it by its muscles, breakdown occurs. Athletes can recover more effectively, work out harder more frequently, increase muscle mass and enhance physical adaptations by not only watching what they eat, but when they eat it.

### **Optimum Nutrition & Training = Optimum Performance**

Most swimmers could complete a training session without supplementing their carbohydrate energy stores, but how is this likely to affect performance on the long as well as the short term?

Once you are running low on carbohydrate energy the body has to rely increasingly upon its fat stores to supply the fuel for exercise. Fat is a very good store of energy, but when it comes to using it, fat has a much higher oxygen cost than carbohydrate. This means that the body will have to work much harder to supply more oxygen to the working muscles in order to go at the same speed, so you will not be able to swim as fast as when carbohydrate is available.

Since it is the carbohydrate energy systems which are most important for success, it makes sense to use and improve these energy systems during training. Training sessions will not only be less mentally taxing but more productive as well! Obvious when you think about its effect on training. Training whilst glycogen depleted will not only be hard work and mentally taxing, but could result in training the wrong energy system for competition. Long training sessions whilst running low on carbohydrate energy will have to be at a lower intensity.

### **Energy Provision**

#### **What is a calorie?**

A unit of measure that tells you how much "energy" is in a type of food. Carbohydrates and protein have 4 calories per gram while fat has 9 calories per gram. Some diets also consider the glycemic index of foods, or how fast a food increases the level of glucose in the blood.

How many calories do people need in a day? A very rough rule is to multiply your weight in pounds by 12 - this is probably the minimum calories one needs to get by day to day; as an athlete, they will need more - they could burn an extra 800 (or more) calories every hour during a workout. If they want to continue to be able to practice, they need to replace this spent energy. How? By eating!!

In order to be able to train hard and swim fast at competition, they need to eat a well balanced diet. Basic guidelines state that in a general diet, approximately 60 % of your daily calories should come from carbohydrates, e.g. pasta, potatoes, beans, cereals, bread, etc 15% from protein, meat, fish, eggs and soya substitutes, etc and 25% from fats, concentrating more on vegetable and fish oils rather than dairy produce - fish like salmon, tuna and mackerel are among the best oily fish to eat and things like olives, avocados and nuts provide useful fats. Also, guard against dehydration. It is important that swimmers prehydrate before they come to training and drink the contents of their water bottle during the session and rehydrate afterwards. As a rough guide, they should be drinking 6-8 glasses of water (rather than fizzy drinks) a day. Not only will this help them train, it will also help them concentrate better at school.

Eat FIVE portions of fruit and/or vegetables a day. Remember that half a tin of baked beans counts as one portion. The vitamins contained in these foods not only help make and keep them healthy but assist their bodies in producing the energy they need for training and competition.

The most efficient source of energy comes from carbohydrate but needs to be eaten well in advance of training and competition to be effective. The easiest way of doing this is to eat regular meals and to plan their meals in such a way that they are not swimming on a full stomach. Imagine the sugar contained in sweets and fizzy drinks like a firework. There is a big bang (i.e. energy) and then nothing soon after. Carbohydrates are more like a lump of coal which burns more slowly (also providing energy) but does this over a longer period of time. In other words, a bowl of pasta eaten the evening before a gala will have a longer lasting effect than a chocolate bar in the morning.

Begin reloading their carbohydrate stores after training in preparation for the next session. Eating a tuna sandwich and an apple within fifteen minutes after their training session would be ideal and will be a lot better than a bar of chocolate.

### **Refuelling the Body After Workout:**

#### **Before Morning training:**

Cereals, toast or a snack type item (cereal bar, fig rolls, toast with jam, a piece of fruit, low fat fruit smoothie.) Make sure they consume adequate fluid before training so that they begin training in a hydrated state.

#### **During Training:**

Make sure they have a drink (water, cordial or a sports drink) so that they are able to keep hydrated throughout the session.

#### **After Training**

Foods that contain both carbohydrates and protein can assist with the replacement of muscle glycogen and speed of muscle damage repair better than either if consumed alone!! Try to get them to consume a 50-100g carbohydrate snack, which also includes protein. In doing so they will replenish muscle glycogen stores, initiate tissue repair and reduce muscle damage. Give them a carton of fruit juice but **no fizzy drinks**.

#### **Recovery snacks providing 50g of carbohydrate and 10g protein include:**

If they get home within the 30 mins:

Bowl of cereal with low fat milk and a banana

500ml smoothie, flavoured milk, milkshake or meal replacement drink

Tub of yoghurt and fruit salad and a muesli bar

2 pieces of toast with ½ can of baked beans

1 tub of fruit yoghurt and a toasted bagel

1 medium serving of pasta or noodles with grated cheese, lean meat, chicken or tuna topping

If they can't get home within 30 mins:

2 sports bars

1 sandwich or roll with a meat/chicken/fish filling or peanut butter and 300ml juice or a sports drink

A couple of handfuls of dried fruit and nuts and a juice

**It's important to refuel an athlete's body after workout, and that window of opportunity is open for just 15 minutes after exercise.**

Their day should start with **BREAKFAST**

High carbohydrate breakfast accompanied by some fruit or fruit juice and maybe even a yogurt. Remember to give them a drink.

### High Carbohydrate Breakfasts

- Cereals – try some wholegrain varieties e.g. bran flakes, shredded wheat, porridge, weetabix or muesli. Add chopped banana or other fresh and dried fruits to increase the carbohydrate content. Use skimmed or semi-skimmed milk, or yogurt with the cereal. Don't choose the same cereal every day and **don't go** for the sweetened cereals e.g. Frosties
- Toast – use whole meal or wholegrain bread. Always go for thick sliced bread. Try raisin bread for a change. Take care not to smother it in high fat spreads
- Scotch pancakes with syrup
- Toasted crumpets/teacakes with a little butter
- English muffins and marmite
- Bagels with jam/honey
- Low fat milkshake with banana/fresh fruit/low fat yogurt
- Fresh fruit and yogurts
- Beans on toast
- Boiled egg and toast



### Mid Morning:

Cereal bar and a drink, **avoid fizzy drinks.**

### Lunch

If they eat school lunch they should select the healthy option such as pasta, rice or baked potato plus some fruit and a drink. If they have a packed lunch they should eat all their sandwiches plus some fruit and a drink - **avoid fizzy drinks.**

### Mid Afternoon

Banana or cereal bar plus a drink - **avoid fizzy drinks.**

### Home from School

Home by 3.30pm. Training at 5 - don't eat after 4. Have a light meal or snack plus a drink - **avoid fizzy drinks.**

### After Training / On Journey Home

As above.

### Supper

High carbohydrate meal with some protein.

Louise Sutton, head of the Carnegie Centre for Sports Performance and Wellbeing at Leeds Metropolitan University, has also worked with top swimmers. She stresses the need for recovery foods. "A lot of people neglect the food they eat after intense exercise, but it's very important. Try drinking fresh fruit juice to supply carbohydrate, fluid and electrolytes or body salts - dilute with water if it tastes too acidic."

As a guideline, they should aim to eat 0.5g of carbohydrate for every pound of body weight two to three hours after they finish training to top up their depleted glycogen stores. **"Rest and replenish are the rules after intense swimming,"** she says. **"Your body needs to recover."**

## Light Meals and Snacks

- Filled sandwiches (thick sliced), rolls, pitta breads. Choose fillings such as cottage cheese, peanut butter, banana, salad, honey, marmite, tuna, chicken, turkey, ham or combinations of these e.g. ham salad
- Thick vegetable/ pulse based ( made with beans) soups and crackers
- Rice or pasta salad
- Beans or scrambled/poached eggs on toast
- Toasted sandwiches – thick sliced with one of the fillings listed above. If they want cheese go for a lower fat option such as Edam
- Jacket potato and filling – opt for low fat fillings such as tuna (no mayonnaise) and cottage cheese rather than cheese
- Risotto
- Tinned spaghetti in a tomato sauce
- Pasta with a light tomato based sauce

## Snacks on the run

Sandwiches as described above

Low fat yogurts and fromage frais

Fresh fruit – apples, bananas, nectarines, oranges, grapes etc

English muffins, scones, crumpets

Scotch pancakes – no butter or margarine

Dried fruit – raisins, apricots etc

Cereal bars

Nuts and dried fruit combinations

Rice cakes, crackers and dry breakfast cereal

## Main Meals

Spaghetti Bolognese

Chili Con Carne

Chicken with Potatoes

Jacket potato with tuna

Have fresh fruit, yogurt or jelly for desert

## Two weeks to go:

For the two weeks building up to a competition they should follow a high carbohydrate/low fat diet. A good example of a high carbohydrate meal would include: Pasta, rice, potatoes (not chips), noodles. Mix this with plenty of vegetables. Make sure they do not start eating foods which they would not normally eat - the last thing you want to do is upset their stomachs.

## One week to go

With just seven days to go until the competition they should have a dress rehearsal of the competition. Get them to try to plan and practice their competition menu and see if it fits in well with the competition. If it works then they will feel more relaxed on the day in the knowledge that the menu suits them. If not then try something different - perhaps a menu which works well for them in training. Remember they need to eat plenty of fruit and veg and drink plenty of fluids.

## Three days before competition:

Their diet should change slightly when the competition moves to just three days away. It is crucial they reduce the number of fats they eat in this period and that they start to build up your glycogen stores. This means eating lots of dishes which are high in starchy carbohydrates such as bread, noodles, rice and potatoes. Try to replace chips in their diet with bread rolls. If they feel like a snack try fruits and high energy snack bars instead of crisps.

### **It is the night before the competition:**

The day before the competition is the time to make sure their body is prepared for the big day. They need to increase their fluid intake - drinking around 500-1000ml of water or isotonic fluid. They need to continue to build up their glycogen stores and remember that the meal the night before the competition is crucial. It could be the difference between victory and defeat. Avoid foods which are high in salt. Give them low fat meals; avoid fried foods, burgers, pies, chips - especially take away's and foods which the athlete is not used to. Give them high carbohydrate foods such as rice, potatoes, pasta, bread, cereals and noodles. Mix high carbs with vegetables or salad

### **Good meals are:**

Ratatouille and rice

Tuna fish or vegetable risotto with bread rolls

Lasagne with crusty bread

Jacket potato with chicken and vegetables

### **Sleep**

Sleep is important because it is the time when children grow and recovery from daily activity takes place. Sleep overs are **NOT** a good idea here 😊 A good nights sleep before a competition is very important.

### **At competition**

After hours of hard training sessions hopefully your child is well prepared. They feeling great and are in tip top form. They have obviously been doing a lot of things right. However, the gala has a different set of challenges; they might face days, sometimes away from home. Hours will be spent on a hot humid pool-side, and they will need to cope with the physical and mental stresses of swimming heats and hopefully finals! You need to plan their eating during a gala as getting it wrong could be costly in terms of their performance. Give them something like a bowl of cereal and some fruit for breakfast. Make sure that they get up early enough to be able to eat breakfast and do not allow them to eat nothing. Cereals are high in carbohydrate, quick and easy, iron rich, calcium rich and low in fat and cholesterol. Avoiding breakfast will lead to depleted glycogen stores and the increased risk of fatigue!

### **Pre-event meal (day of the competition)**

After an eight hour fast **breakfast** is the most important meal before a competition.

An example of a good breakfast would be:

- Cereal or porridge

Plus one of the following:

- A piece of fruit
- Yoghurt

And one of the following:

- Toast with honey or jam or even baked beans
- Pancakes, crumpets, hot cross bun, muffin.
- Isotonic drink - to maintain adequate hydration. The aim should be to drink 300-600ml

### **Don't allow them to:**

- **Have a fry up**
- **Have too many eggs – concentrate more on carbs than protein**
- **Have high sugar kids cereals**
- **Have too much fat or butter – it takes too long to digest**
- **Skip breakfast – swimming on an empty stomach means no energy**

For lunch some pasta and tinned fruit (preferably not at the same time!) is a good idea. Try to get them to eat as soon as the lunch break starts rather than at the end just before the afternoon warm up. Most important, they should not eat too much as this will leave them feeling sluggish. It is much better if they snack during the day between races (without overdoing it) rather than just the one meal at lunch time. For snacks, bananas and cashew nuts are an ideal and tasty combination and will do them a lot more good than chocolate bars. Potassium intake is important when competing so bananas are an ideal snack.

## Before and between races

Food choices will depend on the time between each race and whether your child is an individual who finds it easy to eat at competitions. The best policy is 'little and often'. The ideal time to eat a proper meal before their race is between 2-4hrs. The meal needs to be high in complex carbohydrates and low in fat, as these will release energy slowly. Typical examples are: breakfast cereals, porridge, bread, rolls, toast, fruit juice, fruit, rice cakes, plain crackers, boiled rice, potatoes, boiled pasta, dried fruit, oatmeal biscuits, plain wholemeal biscuits, muffins and carbohydrate sports drinks.

If they have lots of time between a morning and afternoon session then they may opt for a carbohydrate/protein meal such as a jacket potato with baked beans. Make sure they consume adequate fluids whilst on poolside and between sessions and races, to avoid dehydration. The general rule is: 1 to 2 **hours between races - light snack, more than 2 hours - high carbohydrate meal.**

## Snacks to have between events (1-2 hour breaks)

Fruit - fresh/tinned/dried/juice/fruit bars /bananas – very important

Breads - sandwiches/rolls/wraps/pitas – with a light filling/ fruit bread/malt loaf/fruit buns/ fruit scones

Biscuits/cakes - Rice cakes you can top them with honey or jam/fig rolls/Jaffa cakes/plain reduced fat digestives/crackers/ Fruit scones

Dessert - low fat custard/ rice pots /low fat milkshakes/ smoothies

Meal Replacement Drinks (for those who are unable to eat during competition)

Sports Drinks

**Cheese, chips, crisps etc are NOT a good idea.**

## After the competition:

It is crucial that the body is re fuelled with all the energy which has been lost. Give them a high carbohydrate and high protein meal. Immediate carbohydrate/protein intake will help to increase the restoration of the glycogen stores after exercise (approx 1-1.5g of carbohydrate per kg of body weight should be aimed to be consumed immediately after exercise and then 7-10g per kg of body mass over the next 24hrs). Drink plenty of fluid - an isotonic drink if possible. This is especially important if competing the next day or training. **Avoid McDonalds/Burger King – high fat processed foods delay recovery**

Ideas are:

2-3 medium pieces of fruit

1 round of honey or jam sandwiches

1 large mars bar

2 cereal bars

150g thick crust pizza

## Recipes: Energy bar

It contains carbohydrates, protein, fibre and plenty of vitamins and minerals. The fats present are monounsaturated – the good kind. It can be made in large batches, stored for up to a month in the freezer, or a week at room temperature in an airtight container. It's a convenient snack for a swimmer on the run and is much healthier than many store-bought energy bars, which are usually high in saturated fat and contain lots of preservatives.

4 Cups Oats

¼ Cup Honey

1 ½ Cups Sliced Almonds

¼ Cup Canola Oil

1 Cup Plain Shelled Pumpkin Seeds

1 tsp. Vanilla

½ Cup Light Brown Sugar

1 ½ Cup Dried Cranberries or Raisins

½ tsp. Cinnamon

1 Cup Sliced Dried Apricots (no need to soak)

½ tsp. Salt

- \* Preheat oven to 350F (175C) degrees. In a large bowl, mix together oats, almonds, pumpkin seeds, brown sugar, cinnamon and salt.
- \* In a small sauce pan, warm honey and oil over low heat. Stir in vanilla.
- \* Pour honey mixture over oat mixture, and gently stir to combine.
- \* Spread granola out onto a large baking sheet and bake for 40 minutes, stirring every 10 minutes.
- \* Allow granola to cool completely. Stir in fruit and enjoy a healthy, well-balanced snack after workout.

## Hydration

It is well documented that as little as 2% loss in body weight due to dehydration will cause performance to fall by 10%. Dehydration can be a major factor in swimming because of the nature of the environment. When consuming drinks other than water for hydration purposes because they contain carbohydrate, they will also contribute to your overall energy intake.

### Think drink

Because swimming pools are generally cooler than the body's core temperature, it is unlikely that swimmers will sweat too much or overheat, so dehydration is not a great risk. Pool water is generally heated to about 26-29C, which has a cooling effect on the body. Although swimmers don't have as great a need for fluid intake during training as, say, distance runners or cyclists, they still need to make sure they drink enough. Generally, the rule is to drink about 125ml of fluid for every kilometre swum.

### What is dehydration?

Dehydration is the loss of water and important blood salts like potassium. If you are suffering from dehydration vital organs such as the kidneys, brain, and heart can't function as they require a certain minimum of water and salt.

### Does the body help us prevent dehydration?

The body tries to stay around a temperature of 37 degrees by sweating. This results in the loss of body fluid. If fluid levels are reduced it can lead to dehydration and heat stroke.

### What are the tell-tale signs of dehydration?

You are probably dehydrated if you are thirsty, have dry lips and a dry mouth. A more serious form of dehydration occurs if you have blue lips, a weak pulse, quick breathing, confusion, dizziness, fatigue and poor co-ordination.

Athletes should normally try to drink up to two litres of water a day; this is especially important during the week leading up to the competition, so the risk of dehydration is minimised.

### What type of fluid?

There are 3 different types of drinks for athletes – **Hypotonic / Isotonic / Hypertonic**

### What do they do?

They are designed to quickly replace the fluids which are lost by sweating. They also provide a boost of carbohydrate. Hypotonic are best, followed by Isotonic. Hypertonic are not really designed for re hydration but for refuelling after re hydration.

**Hypotonic:** (4% solution) – absorption tends to be faster than plain water. Effective for fluid replacement during exercise.

25ml unsweetened fruit juice	100ml orange squash
Pinch salt	Pinch salt
Make up to 1 litre with water	Make up to 1 litre with water

**Isotonic:** (5-7% solution) – absorption is slower than hypotonic or water. Sufficient carbohydrate to aid fluid and fuel replacement. Effective for endurance exercise lasting more than 1 hour.

500ml unsweetened fruit juice	200ml orange squash
Pinch salt	Pinch salt
Make up to 1 litre with water	Make up to 1 litre with water

**Hypertonic:** (e.g. Lucozade @ 19% solution) – absorption slow and may increase dehydration. Used to refuel after rehydration. Effective after hard exercise when food is 'unavailable' or 'not fancied'.

1 litre unsweetened fruit juice	400ml orange squash
Pinch salt	Pinch salt
	Plus 1 litre of water

**Excerpt from swimming magazine:**

*A reader writes: I am always at a loss for what to feed my swimmers before a big meet. Their next one is two days away - I stress out for my children! They look to me for "what to eat" (not how to swim). I understand there should be no major changes in their diet for that day. Fruits and vegetables can be difficult to digest. Orange works for one but the other child gets sick. A salad or broccoli could be difficult to digest. Bananas can be OK but I'm not sure. Not sure about digesting grapes either. They both stay away from spicy food. One child always has eggs for breakfast, but the other cannot tolerate eggs on swim day. One likes an energy bar during or before the meet. What specific food should my children eat before their next swim meet? I worry about carbs, protein, and fats but more specifically, what should they put in their mouth?*

Answer: I think you are doing a great job helping your children make good food choices. There are plenty of things that will work, and as you have found what is good for one swimmer is not as good for another. Some of the choices will vary based on timing - what works if eaten three or more hours prior to a meet might be a bad choice eaten 30-minutes prior to a meet!

The meal decision requires some real-world testing, and with a day or two to go before the meet it may be a bit too late to try new things. I suggest you go with what you know works for each of them, regardless of whether it is a breakfast, lunch, or dinner type of meal. What is their favourite pre-swim meal? Go with it! It could be pasta, noodles, rice, cereal, toast, eggs, a sub-type sandwich, pancakes, waffles, even a peanut butter sandwich - as long as it is a meal that hits the main food groups, is easy for them to digest, and is familiar to them.

Get that main meal done two to three hours prior to swimming, then "keep the fuel tank topped off" with easy to digest, lighter foods - fruit (apples, oranges, bananas, raisins, pears, etc.), power bars, sport drink, , pop-tarts, a simple sandwich (peanut butter and banana, banana and honey, jam, etc.), low-fat pudding, rice cakes, plain toast, etc.

Feed 'em what you know is good for them and what they think of as tasting good and that they feel good eating. Later on, try a few different things prior to swim practices and learn what other choices may work for your swimmers