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Nutrition Guide



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Healthy Eating

Why is nutrition for athletes important?

A good training diet is an essential part of every fitness programme and will help you achieve your training and competitive goals. The right type and quantity of food will help you maintain peak health and perform at your best.

What are athletes' dietary needs?

Training and competing in sport involve a range of activities of varying energy demands. The main factors that determine your energy needs are body size and training load.

One of the quickest and easiest ways to put together a sensible training diet is by using the 'Balance of Good Health' food plate.



| Food Group | Portions per day | Percentage of diet |
|-----------------------------------|---------------------------------------|--------------------|
| Fruit and vegetables | 5+ | 33% |
| Bread, other cereals and potatoes | 5-11 | 35% |
| Milk & Dairy | 2-3 | 15% |
| Fatty and sugary foods | Healthy fats 1-3 Unhealthy fats <1 | 6% |
| Meat, fish & alternatives | 2-3 | 12% |

How to use the food plate

- Include foods from each group on the plate every day
- Make sure you include a variety of foods within each group
- Aim to have the recommended number of portions each day
- Check the portions sizes given on the next page

Fruit and Vegetables

Goal = 5+ Portions

Fruit and vegetables are rich in many vitamins and minerals and are also a great source of fibre and other beneficial plant substances called phytochemicals.

How to achieve your goal:

- Include one portion of fresh fruit with your breakfast, eg. sliced banana or dried apricots on breakfast cereal.
- Eat at least two portions of fresh fruit as snacks throughout the day.
- Add a side salad or raw vegetables to your lunch or dinner
- Include two portions of vegetables in your main meals either on their own or in soups, curries and sauces.
- Include extra salad in your sandwiches.
- Follow your main meals with fresh fruit or a fruit based dessert such as apple crumble, banana custard, baked apples, or fruit mixed with yoghurt.

What is a portion?

| | |
|---------------------|--|
| Fresh fruit | 1 apple/pear/peach/orange/ banana 100g (4oz) berries such as strawberries 100g pineapple/grapes 4 apricots/plums 2 kiwi fruit |
| Tinned fruit | 1/2 tin (200g) of pineapple/ apricots |
| Fruit juice | 1 glass (100ml) juice |
| Vegetables | In general, 100g (4oz) vegetables 2 carrots/courgette 2 florets broccoli 10 brussels sprouts 2-3 tbsp spinach/cabbage/ runner beans |
| Salad | 1 large tomato 3 celery sticks 1 cos lettuce/half iceberg lettuce |



Vegetable ideas

- Add a handful of frozen peas or mixed vegetables to the saucepan while cooking pasta.
- Add extra mushroom, peppers, aubergines or courgettes to ready-made curry sauces.
- Keep a container of vegetable crudites (carrots, cucumber, courgette, cauliflower) for snacking on or for starters.
- Hide pureed vegetables in soups, lasagnes, stews and pies.
- Make fast foods healthier by adding extra vegetables, eg. Pizza with mushrooms, peppers, tomatoes. Hamburgers with tomato and cucumber. Burritos with lettuce and fresh salsa.

Each day you should aim to have:

- At least one orange/yellow fruit or vegetable (eg. mango, apricots, carrot) for antioxidants and beta-carotene.
- At least one red fruit or vegetable (eg. tomatoes, watermelon) for cancer beating lycopene.
- At least one berry fruit or citrus fruit (eg. strawberries, raspberries, oranges) for immunity - boosting bioflavanoids and vitamin C.
- At least one dark green vegetable a day (eg. broccoli, cabbage, watercress, spinach) for iron and folic acid.

Bread, Other Cereals and Potatoes

Goal = 5-11 Portions (7-11 portions for active people)

This group includes bread, pasta, rice, noodles, breakfast cereals, oats, crackers as well as starchy vegetables such as potatoes, sweet potatoes and parsnips. Foods in this group provide complex carbohydrates, B vitamins and fibre. Check your portion sizes to make sure you are eating the right amount. Around 60% of your total energy intake should come from carbohydrates.

How to achieve your goal:

- Start your day with at least 2-3 portions from this group, eg. One large bowl of wholegrain cereal or porridge; 2-3 thick slices of wholemeal toast; English muffins.
- Be more adventurous with the type of bread you choose – try rye, Spanish, focaccia, ciabatta, seeded, pitta, muffins, bagels, sunflower, herb bread.
- Aim to have at least 2-3 portions of foods from this group with each meal – base meals around pasta, noodles, potatoes, rice, cous cous, bulgar wheat or bread.
- Include two portions of vegetables in your main meals either on their own or in soups, curries and sauces.
- Use cooked grains, such as rice or bulgar, to fill vegetables such as aubergines, courgettes and peppers.

What is a portion?

| | |
|---------------------------|--|
| Bread | 1 slice bread 1 small roll 1/2 bap 1/2 bagel 1/2 large pitta/chippati |
| Cereals/grains | 2 heaped tbsp cooked pasta/ rice/noodles |
| Starchy Vegetables | 1 medium (175g/6oz) baked or boiled potato 3 new potatoes 2 tbsp cooked sweet potato/ yam 2 tbsp sweetcorn 1 large parsnip |
| Breakfast cereals | 1 small bowl (25g/1oz) breakfast cereal 2 weetabix 1 'variety pack' box cereal |
| Crackers | 3 crackers/crispbreads/ rice cakes |

Tips

- Instead of grabbing a croissant and a cup of hot chocolate (331kcal/17.1g fat), have an English muffin with fruit spread, a banana and a glass (140ml) of orange juice instead (330kcal/1.8g fat).
- Make sure most of your portions are wholegrain varieties, eg. Wholemeal bread/pasta, wholegrain cereal.
- Instead of butter, top jacket potatoes with fromage frais, yoghurt, cottage cheese or hummus.
- Eat boiled or roast potatoes with their skins left on. There is no need to peel potatoes used in soups, stews and casseroles.

Milk and Dairy

Goal = 2-3 Portions

The foods in this group include milk, cheese, yoghurt and fromage frais which are rich sources of calcium. They also provide protein, vitamin B12, riboflavin, and (apart from fat-free varieties) vitamins A and D. Many athletes misguidedly cut down on milk and dairy products because of their fat content, but this means missing out other nutrients such as calcium and vitamin B12. Instead, switch to low fat varieties; they provide all the protein, minerals and water soluble vitamins of full fat varieties, but with less fat and fat soluble vitamins A and D.

How to achieve your goal:

- Have 200ml (? pint) milk per day (semi-skimmed or skimmed) on breakfast cereals, in drinks or puddings.
- If you don't like milk on its own, use it in shakes, custard sauces or rice puddings.
- Aim to have one portion of cheese (preferably low fat) per day.
- Have a pot of low fat yoghurt or fromage frais for dessert.
- Use yoghurt as a base for salad dressings – add herbs, spices or lemon juice.

What is a portion?

| | |
|------------------------------|--|
| Milk | 200ml (1/2 pint) |
| Cheese | 1 matchbox-sized piece (40g/1 1/2oz) hard cheese |
| Yoghurt/fromage frais | 1 small pot (150g/5oz) yoghurt or fromage frais |



Tips

- Use semi-skimmed or skimmed milk instead of full fat.
- Limit hard (full fat) cheese to 1-2 portions per day.
- Choose low fat varieties of yoghurt/fromage frais.
- In recipes, use a strong flavoured or mature cheese so you can cut down on the amount needed.

Meat, Fish and Alternatives

Goal = 2-3 portions

This group includes lean meat, chicken, turkey, fish, eggs, beans, lentils, nuts, soya and quorn. These foods supply protein, vitamins and minerals. Vegetarians can get plenty of protein from plant sources, but you may substitute extra dairy foods for one of the portions in this group.

How to achieve your goal:

- Aim to have at least half your portions from non-meat sources.
- Use smaller amounts of meat in stews, bolognese sauce, pasta sauces, risotto, shepherd's pie – substitute pulses and vegetables for some of the meat.
- Eat at least one portion of oily fish a week eg. mackerel, trout or sardines. The oils are rich in omega-3 fatty acids, important for preventing strokes and heart attacks and their beneficial circulatory properties help boost exercise performance.
- Include at least 3 portions of pulses per week – make pulses the base for stews, curries, salads and casseroles.
- Limit processed meat (eg. burgers, sausages) to once a week or less.

What is a portion?

| | |
|-----------------------------|--|
| Meat | 2 thin slices (50-75g/2-3oz) red meat 1 small chop (50-75g/2-3oz) 3 thin slices ham |
| Poultry | 75g (3oz) chicken/turkey (weighed without bone) 1 small breast |
| Fish | 1 medium fillet (150g/5oz) white fish 1 small fillet (75g/3oz) oily fish 1 small tin (100g/4oz) tuna 75-100g (3-4oz) prawns |
| Eggs | 2 |
| Pulses | 1/2 large tin (420g) baked beans/ red kidney beans/chick peas/other beans 3 heaped tbsp cooked beans/ lentils/ peas |
| Nuts | A small handful (50g/2oz) nuts or seeds |
| Soya/tofu/ quorn | 100g (4oz) tofu/quorn 3 tbsp soya or quorn mince 1 tofu/quorn burger |



Tips

- Choose lower fat food from this group whenever possible - very lean meat, fish, poultry (without skin), pulses, eggs (up to 6 per week), quorn and soya.
- If you eat meat, make sure it is lean and well trimmed.
- If you eat poultry, remove the skin before or after cooking.
- In restaurants, order grilled fish, not fried, and reduce fat by 15g (145kcal).
- Cook meat, fish and poultry with out added fat - dry frying, grilling, baking or poaching.

Essential Fats and Oils

Goal = 1-3 portions

This group includes foods rich in essential oils: nuts (walnuts, cashews, almonds, pecans, brazils, pine nuts), seeds (sesame, pumpkin, sunflower), cold-pressed seed and nut oils (flax seed, pumpkin seed, walnut, sesame and sunflower), and oily fish (sardines, mackerel, pilchards, trout).

How to achieve your goal:

- A small handful of nuts or seeds eaten as a snack.
- A tablespoon of cashews or peanuts added to a stir-fry.
- A tablespoon of oil in a dressing or sauce.
- Stir a tablespoon of essential oil (eg. flaxseed or a blended essential oil) into a soup or a pasta sauce just before serving.

What is a portion?

| | |
|---------------------------|---|
| Nuts and seeds | 1 heaped tablespoon |
| Nuts and seed oils | 1 tablespoon |
| Oily fish | 85g (3oz) fish (this is the richest source of Omega-3 oils so 1-2 portions a week would more than cover your needs. |



Tips

- Choose plain, unsalted nuts and avoid those with coatings or flavourings.
- Lightly toast nuts and seed under a grill or in a hot oven for a few minutes to bring out their flavour.
- Add nuts and seeds to salads, muesli, stir-fries, crumble toppings and yoghurt.
- The nutritional value of nuts, seeds and oils is easily destroyed by heating and by exposure to light and air. So, store in dark bottles in a cool, dark place.

Fatty and Sugary Foods

Goal = up to 1 portion

This group includes biscuits, cakes, sweets, soft drinks, chocolate, puddings and crisps. These supply lots of calories with very few (if any) essential nutrients ('empty calories').

How to achieve your goal:

- Regard fatty and sugary foods as treats rather than everyday foods.
- Limit high fat puddings and cakes to three times per week or less.
- Limit salty/sugary snacks to three times per week or less.

What is a portion?

1 packet crisps
3 biscuits
1 slice cake
1 chocolate/confectionary bar



Tips

- Sandwiches/rolls/pitta/bagels (filled with cottage cheese/peanut butter/banana/salad/honey/marmite/tuna/chicken/turkey/ham)
- Low fat yoghurt and fromage frais
- Fresh fruit
- English muffins/scones/crumpets/potato cakes
- Dried fruit
- Dried fruit bars/'energy bars'/cereal bars
- Nuts and dried fruit mixtures
- Rice cakes/crackers/bread sticks

Calcium

Calcium is an essential nutrient needed for bone development and maintenance. Calcium is important because of its role in bone health and osteoporosis. Many athletes, especially females, do not consume enough of this mineral. Long-term low intake levels of calcium can affect both bone mass and muscular contraction. 700mg/day of calcium is enough to make sure there are no deficiencies. Good sources of calcium include:

| Source of calcium | Portion size | Mg calcium |
|-----------------------------------|------------------------|------------|
| Semi-skimmed milk | 1 pint | 702 |
| Reduced fat cheddar cheese | Average in sandwich | 410 |
| Yoghurt | 150g pot fruit yoghurt | 225 |
| Sardines (canned in tomato sauce) | 4 sardines | 460 |
| Baked beans | 450g can | 239 |
| Broccoli | 3 spears | 54 |
| Sesame seeds | 2 tablespoons | 134 |
| Orange | 1 large | 99 |

Tips

- For breakfast have cereal and milk – taken together the absorption of calcium from the cereals is increased
- Add grated reduced fat cheese to salads
- Sprinkle sesame or sunflower seeds on salads and vegetables
- Use yogurt based dressings for salads
- Have one snack of yogurt, apricots or oranges a day
- Make an effort to include dark green vegetable often in your diet eg. broccoli, spinach, spring greens and water cress.



Iron

Iron is important for athletes, especially females. Its major function is the formation of haemoglobin (which transports oxygen in the blood) and myoglobin (which transports oxygen in the muscle cells). Many muscle enzymes involved in energy metabolism require iron. Athletes who are vegetarian or who eat less than 2000 kcal/day are more likely to become iron deficient. The symptoms of iron-deficiency anaemia are fatigue, headaches, light-headedness and above-normal breathlessness during exercise. However, these symptoms could be caused by many other illnesses. A blood test will confirm whether you are iron deficient. The reference nutrient intake for iron mg/day is 8.7 for males and 14.8 for females. Good sources include red meat, cereals, fruit and dark green leafy vegetables, nuts and seeds.

Iron is absorbed more efficiently when it exists in the ferrous form (animal sources). When it is in the ferric form (plant sources) it is absorbed less efficiently. However, absorption is enhanced in the presence of vitamin C or other fruit acids so it is beneficial to have vitamin C, rich fruit, vegetables, or juice, with iron-containing foods. For example, orange juice with breakfast cereal. This is especially important for vegetarians.

| Source of Iron | Portion size | Mg iron |
|-------------------------------------|-----------------------------|---------|
| Roast chicken (meat only) | 1 medium breast | 0.8 |
| Minced Beef (lean) | Small average portion | 4.7 |
| Lean roast lamb | Average portion | 2.0 |
| Tuna in brine | 1 small can | 1.0 |
| Liver (lambs, cooked) | 2 slices | 8.0 |
| Wholemeal bread | 2 slices, medium large loaf | 1.9 |
| Branflakes | 40g serving | 8.0 |
| Baked Beans | 450g can | 6.3 |
| Red kidney beans | 1/2 440g can | 4.4 |
| Apricots (semi-dried, ready to eat) | 4 apricots | 3.4 |

Tips

- Select breakfast cereals that are fortified with iron.
- The absorption of iron from vegetable sources can be improved by eating vitamin C rich foods.
- Combine poorly absorbed vegetable sources of iron with animal sources eg. broccoli with beef, beans with beef in chilli con carne to improve overall absorption.
- Use yogurt based dressings for salads.
- Have one snack of yogurt, apricots or oranges a day.
- Vegetarians should ensure their diet contains some of the following on a daily basis – wholegrain cereals and flours, nuts, green vegetables, pulses, dried fruit and seeds.



Vitamins

Vitamins are required in tiny amounts for growth, health and physical wellbeing. If you are eating a well balanced diet, supplementation with one or more vitamins will not result in increased physical performance, prevent injuries, provide energy or build muscles. Excess vitamins offer no competitive edge, in fact some may cause gastro intestinal upsets. However, regular, intense exercise increases your requirements for a number of vitamins particularly those involved in energy metabolism, tissue growth and repair, red blood cell manufacture and free radical defence.

| Vitamin | Function | Sources |
|--|--|---|
| E | Powerful antioxidant which prevents the oxidation of fatty acids in cell membrane and protects the cell from damage | Vegetable oils (sunflower, safflower, corn), wholegrain cereals, dark green vegetables, nuts, oily fish |
| C (ascorbic acid) | Required for the formation of connective tissue and certain hormones (eg. adrenaline), which are produced during exercise. Also needed for absorption of iron. | Most fruit and vegetables, especially blackcurrants, strawberries, oranges, tomatoes, broccoli, green peppers, sweet potato |
| B ₁ (thiamin) B ₂ (riboflavin) B ₃ (niacin) | Involved in releasing energy from food. | Wholegrain cereals, bread, oatmeal, brown rice, meat, pulses, nuts, liver, milk, cheese, eggs |
| B ₅ (panthothenic acid) | Needed for making glucose and fatty acids from other metabolites in the body. | Yeast and yeast extracts, liver and other offal, cereals, nuts, pulses, vegetables |
| B ₆ (pyridoxine) | Allows the body to use and store energy and to form haemoglobin so is very important to athletes | Pulses, nuts, eggs, cereals, bread, chicken |
| B ₁₂ (pyridoxine) | Formation of red blood cells, energy metabolism, helps process folic acid | Meat, salmon, cod, wholegrain cereals, milk, cheese, eggs |
| A (retinol) | Helps vision in dim light, maintains healthy skin and lining of the digestive tract | Full fat dairy products, eggs, carrots, green leafy vegetables, apricots, tomato |
| D | Needed to build strong bones. Needed to absorb calcium and phosphorus | Sunlight, oily fish, fortified margarine and breakfast cereals, eggs |
| K | Used to control blood clotting. Also involved in bone formation and repair | Green leafy vegetables, liver |

Tips to keep the vitamins in food

- Buy fresh, firm fruit and vegetables; avoid bruised, soft or wilted produce.
- Keep vegetables in a cool dark place, such as the salad compartment in the fridge.
- Don't prepare food too far in advance - vitamins are lost if cut up fruit or vegetables are left to stand.
- Keep the skin or peel on whenever possible as most vitamins are found just under the skin.
- Cut into large pieces rather than small; vitamins are lost from cut surfaces.
- Cook vegetables in the minimum amount of water - steaming, microwaving or stir-frying retains more vitamins
- Make sure water is fast boiling before adding vegetables.
- Cook vegetables for as little time as possible until they are tender crisp.
- Save the cooking water for soup, stock and sauces.

Alcohol

Drinking alcohol may appear to make you more alert and confident but, even in small amounts it will certainly have the following negative effects.

- Reduce coordination, reaction time, balance and judgement
- Reduce strength, power, speed and endurance
- Reduce your ability to regulate body temperature
- Reduce blood sugar levels and increase the risk of hypoglycaemia
- Increase water excretion and the risk of dehydration
- Increase the risk of accident or injury.

The Department of Health suggests a maximum of 3 units per day and 14 units per week for women; and a maximum of 2 units per day and 21 units per week for men.

Size of 1 unit

250ml (1/2 pint) ordinary strength beer/lager
 1 small glass (125ml) wine
 1 single measure spirits



Sensible drinking guidelines

- Intersperse alcoholic drinks with water, diluted juice or other non-alcoholic drinks
- Extend your alcoholic drinks (wine, spirits) with water, low calorie mixers or soda water.
- Keep a tally on your alcohol intake when you go out – set yourself a safe limit.
- If you think you have drunk too much, drink plenty of water/sports drink before you go to bed – at least 1 pint per 2-3 units.
- Don't drink on an empty stomach as this speeds alcohol absorption.
- To minimise a hangover, choose pale coloured drinks (e.g. white wine) rather than dark drinks; avoid carbonated drinks (e.g. gin and tonic, champagne) as the alcohol is absorbed faster.

Competition Nutrition

Glycemic Index

The glycaemic index (GI) was developed to describe the effect different foods have on your blood sugar levels. Foods are ranked from 0 to 100 based on their immediate effect on blood sugar levels, a measure of the speed at which you digest food and convert it into glucose. The faster the rise in blood glucose, the higher the rating on the index. If you need to get carbohydrate into your bloodstream and muscle cells rapidly, for example, immediately after exercise to kick-start glycogen replenishment, you would choose high GI foods.

The carbohydrate you consume should be easily digested and absorbed as you need it to raise your blood sugar level and reach your exercising muscles rapidly. However, some factors can influence the GI of a food.

| Factor | Function |
|---------------------------------|---|
| Particle size | Most breakfast cereals like cornflakes and rice crispies have a higher GI than muesli or porridge |
| Degree of starch gelatinisation | Cooked potatoes have a high GI and biscuits have a low GI |
| Fat | Potato crisps have a lower GI than plain boiled potatoes. Adding butter or cheese to bread lowers GI |
| Sugar (sucrose) | Sweet biscuits, cakes, sweet breakfast cereals, honey have a high GI. |
| Protein | Beans, lentils, pasta (contain protein as well as carbs) lower GI. Eating chicken with rice lowers GI. |
| Amylose to amylopectin ratio | Beans, lentils, peas and basmati rice have high amylose content, i.e. low GI. Wheat flour and its products have high amylopectin content i.e. high GI |
| Soluble fibre | Beans, lentils, peas, oats, porridge, barley, fruit have a low GI. |

For more information on the glycemic index go to www.glycemicindex.com

The week before a competition

Your two main aims are:

- To fill your muscle and liver glycogen stores so that you compete with a full fuel supply
- To keep well hydrated

Obviously the preparation for your individual competition will be dependent on what kind of event, the importance and how frequently you compete.

- Taper training
- 60-70% carbohydrate or 7-8kg body weight/day
- Low GI meals
- Monitor fluid intake
- **Examples of meals**
 - Pasta with fish or beans
 - Rice with chicken or tofu
 - Jacket potatoes with tuna or cottage cheese

The day before

Your two main aims are:

- Top up muscle glycogen stores
- Ensure you are well hydrated

Continue eating meals which have a low GI and drink plenty of fluid. To maximise muscle glycogen replenishment perform only very light exercise or rest completely. Don't miss your evening meal as this is important for topping up glycogen stores. Still try to eat if you're nervous but stick to familiar and simple foods and avoid fatty or oily foods and alcohol.

- High carbohydrate meal (low GI)
- Keep drinking plenty of fluid
- Moderate - low fibre
- Low fat
- Familiar foods
- **Examples of meals**
 - Pasta with tomato based sauce
 - Rice dishes

Competition Day

Ideally, you should eat between 2 and 4 hours before training, leaving enough time for your stomach to settle so that you feel comfortable – not too full and not too hungry. It also leaves enough time for your blood sugar and insulin levels to normalise. Nervousness can slow down your digestion rate so if you suffer from pre-competition nerves, you may need to leave a bit longer between eating and competing. It is not a good idea to skip breakfast, particularly if the event lasts longer than 1 hour or you are competing in a number of heats. It is most sensible to eat a low GI meal 2-4 hours before exercise and a higher GI snack 1-2 hours before exercise.

Your pre-competition meal should be:

- Based on low GI carbohydrates
- Low in fat
- Low in protein
- Low or moderate in fibre
- Not too bulky or filling
- Not too salty or spicy
- Enjoyable and familiar
- Easy to digest
- Include a drink – approximately 500ml 2 hours before the event.

| Pre-workout meals | | |
|--|--|--|
| Pre-competition breakfast (2-4 hours before exercise) | Pre-competition lunches (2-4 hours before exercise) | Pre-workout snacks (1-2 hours before exercise) |
| <ul style="list-style-type: none"> • Breakfast cereal or porridge with low fat milk and fresh fruit • Toast or bread with ham/honey; low fat yoghurt • English muffins with honey • Meal replacement shake | <ul style="list-style-type: none"> • Sandwich/roll/bagel/wrap filled with chicken, fish, cheese, egg or peanut butter and salad • Jacket potato with beans, cheese, tuna, coleslaw or chicken • Pasta with tomato based sauce and cheese and vegetables • Chicken with rice and salad • Vegetable and prawn or tofu stir-fry with rice or noodles • Pilaff or rice salad • Chicken and vegetable cassarole with potatoes • Fish and potato pie | <ul style="list-style-type: none"> • Fresh fruit, eg. apples, bananas, oranges, grapes, kiwi • Dried apricots, dates or raisins • Tinned fruit • Smoothie • Low fat yoghurt • Yoghurt drink • Shake (home made or a meal replacement shake) • Energy or nutrition bar • Fruit loaf or raisin bread • Diluted fruit drink |

If you suffer from pre-competition nerves and can't face solid food, you could consume liquid meals such as meal replacement products (protein-carbohydrate sports supplements), sports drinks, milk shakes, yoghurt drinks and fruit smoothies. You could try smooth, semi-liquid foods such as pureed fruit (apple, banana or apricot), yoghurt, porridge, custard and rice pudding. Bland foods such as semolina, mashed potato, or porridge made from cornmeal or ground rice might agree with your digestive system better. Avoid high fibre foods such as bran cereals, dried fruit and pulses. Caffeine can also cause digestive problems when combined with nerves. Basically, avoid anything that is new and unfamiliar.

During competition

If you are competing for more than 60 minutes, you may find that extra carbohydrate will help delay fatigue and maintain your performance, particularly nearer the end. Depending on your exercise intensity and duration, aim to take in 30-60g carbohydrate/hour. Start consuming the food and drink after about 30 minutes and continue at regular intervals, as it takes approximately 30 minutes for digestion and absorption. Any carbohydrate with a high or moderate GI would be suitable but many people find liquids easier to consume than solids. If you are competing for more than 60 minutes, avoid or delay dehydration by drinking 125-250ml every 10-20 minutes during exercise. Clearly, the more you sweat, the more you need to drink. However, do not use thirst as an indicator as you are already dehydrated if you are thirsty. If you compete in several heats or matches during the day, it's important to refuel and rehydrate as fast as possible so that you have a good chance of performing well in your next event.

| Suitable foods and drinks to consume during exercise | |
|--|---|
| Food or drink | Portion size providing 30g carbohydrate |
| Bananas | 1-2 Bananas |
| Raisins or sultanas | 1 handful (40g) |
| Cereal or breakfast bar | 1 bar |
| Diluted fruit juice (1:1) | 500ml |
| Energy bar | 1/2 - 1 bar |
| Energy gel | 1 sachet |
| Glucose polymer drink (12g/100ml) | 250ml |
| Isotonic sports drink (6g/100ml) | 500ml |

Post competition

What you eat after exercise is very important especially if you are competing again the next day or if you are taking part in event or heats. You should start refuelling as soon as possible after exercise as glycogen replenishment is most rapid in the first 2 hours. You should try to eat 1g/kg body weight of carbohydrate during the 2 hour post exercise period. You should eat foods with a moderate to high GI.

| Food or drink | Portion size |
|---------------------------|-----------------|
| Diluted fruit juice (1:1) | 500ml |
| Raisins or sultanas | 1 handful (40g) |
| Cereal or breakfast bar | 1 bar |
| Bananas | 1-2 Bananas |
| Fresh fruit | 1-2 portions |
| Sandwich/roll/bagel | 1 |
| Wholegrain cereal | 1 bowl |
| Energy bar | 1 bar |

Your immediate post-event food should be followed by a carbohydrate rich meal approximately 2 hours later. Avoid rich or fatty meals (e.g. chips, burgers, curries) as they will delay recovery. Drink plenty of rehydrating fluid and wait a few hours before drinking any alcohol. It is also a good idea to include some protein in your post exercise meal or snack as this has shown to be more effective in promoting glycogen recovery than carbohydrate alone.

Fluid

When you exercise fluid is lost through sweating and water vapour. During 1 hour of exercise, an average person could lose around 1 litre of fluid.

Dehydration results in decreased performance:

- Loss of 2% in weight results in aerobic capacity falling by 10-20%
- Loss of 5% results in aerobic capacity falling by 30%.

Symptoms of dehydration include sluggishness, fatigue, headaches, loss of appetite, feeling excessively hot, light headedness and nausea. Do not be guided by thirst as an indicator of dehydration. Sodium increases the urge to drink and improves palatability. If you drink water, it effectively dilutes the sodium, thus reducing the urge to drink before you are fully hydrated. Therefore a small amount of sodium will encourage you to drink more fluid.

Hypotonic has a relatively low osmolality which means it has fewer particles (carbohydrate and electrolytes) per 100 ml than the body's own fluids. As it is more dilute, it is absorbed faster than plain water. Typically, a hypotonic drink contains less than 4g carbohydrate/100ml

Isotonic has same osmolality as body fluids and is therefore absorbed faster or as fast as plain water. Most commercial isotonic drinks contain between 4-8g carbohydrate/100ml. In theory, these provide ideal compromise between refuelling and rehydration.

Hypertonic higher osmolality than body fluids, it is more concentrated so is absorbed more slowly than plain water. Contains more than 8g carbohydrate/100ml.

Carbohydrate drinks based on glucose polymers also replace fluids but provide greater amounts of carbohydrate (10-20%) at a lower osmolality. They are most suitable for prolonged intense exercise (>90 minutes), when fuel replacement is a major priority or fluid losses are small.

You can easily make up your own sports drinks which can save time and money.

| Hypotonic | Isotonic |
|---|---|
| <ul style="list-style-type: none"> • 100ml fruit squash 900ml water 1/4 tbs salt • 250ml fruit juice 750ml water 1/4 tbs salt | <ul style="list-style-type: none"> • 200ml fruit squash 800ml water 1/4 tbs salt • 500ml fruit juice 500ml water 1/4 tbs salt |

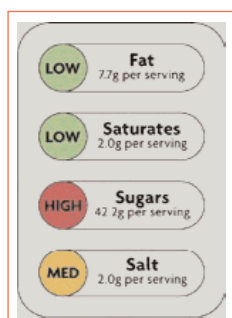
Labelling Guide

Food labels always seem to be packed with information which is hard to follow and understand. This section will help you pick out the information you need to make healthier, safer and more informed choices when you are choosing between products.

Healthy eating: front of pack nutrition labelling

If you want to eat a healthy diet you should cut down on fat (especially saturated fat), salt and added sugars. When you are checking food labels to choose which products to buy, traffic light colours can help you make that choice quickly and easily.

Some supermarkets have started using a traffic light labelling system. This is to help you see at a glance if the food has low, medium or high amounts of fat, saturated fat, salt and sugar.



What the colours mean

Green = Low - try to choose products with mostly greens

Amber = Medium - this is an ok choice most of the time, but you might want to go for green some of the time

Red = High - try to cut down on products with red traffic lights

List of ingredients

Ingredient lists provide useful information about what is in your food. Most pre-packed foods must be labelled with their ingredients, listed in descending order of their weight.

Claims on labels

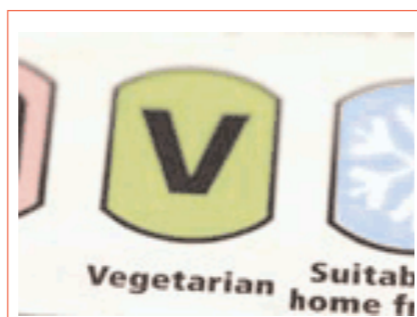
When you see health and nutrition claims on labels you need to view them with caution, as they aren't all yet defined in law. One of the exceptions is 'reduced calorie' which is defined in law. It means the product should be at least 25% lower in calories than the standard product. It is usually best to check the nutrition panel and the ingredient list.

Vegetarian and Vegan

If a food is labelled vegetarian, this should mean that the food doesn't contain any meat, fish or poultry etc, or animal-derived additives such as gelatine. In the case of cheese, it should mean that animal-derived rennet hasn't been used to make it. If a food is labelled vegan, this should mean that the food doesn't contain any animal products, including those from living animals – such as milk.

Ingredients

Potato (45%), Salmon (20%), Prawn (5%), Water, milk, Onion, White Wine, Double Cream, Skimmed Milk Powder, Modified Maize Starch, Low Fat Cheddar, Cheese, Fish, Bouillon (Salt, Dehydrated Cod, Potato, Starch, Sugar, Milk Powder, Yeast Extract, Palm Oil, Yeast Powder), Concentrated Lemon Juice, Parsley, Flavouring, Mustard Powder, Pepper



Nutrition Panel

| Nutrition Information | | |
|-----------------------|---------------------|-----------------------|
| Nutrient | Per 100g | Per serving [(400g)] |
| Energy | 404.6KJ/ 97 Kcal | 1618.4 KJ 388 Kcal |
| Protein | 63.0g | 25.5g |
| Carbohydrate | 9.6g | 38.4g |
| of which sugars | 2.0g | 8.0g |
| starch | 7.7g | 30.8g |
| Fat | 3.6g | 14.6g |
| of which saturates | 1.3g | 5.0g |
| mono-saturates | 1.4g | 5.4g |
| polystaurates | 0.7g | 2.6g |
| Fibre | 1.6g | 6.4g |
| Sodium | 0.2g | 0.8g |
| Salt | 0.5g | 2.0g |

Energy

This is the amount of energy that the food contains. It is measured either in calories (kcal) or kJ.

Protein

The body needs protein to grow and repair itself. Protein-rich foods include meat, fish, milk and dairy foods, eggs, beans, lentils and nuts.

Carbohydrate

The body turns carbohydrate into energy. Simple carbohydrates, which include added sugars and the natural sugars found in fruit and milk, are often listed on food labels as 'Carbohydrates (of which sugars)'.

Complex carbohydrates

Sometimes known as starchy foods) include bread, cereals, rice, pasta and potatoes. Where possible, you should try to eat more complex carbohydrates. Sometimes you will only see a total figure for carbohydrates on food labels.

Fat

Fat carries a lot of calories. Many food labels give figures for product's fat content. Some food labels also break the figures down into different types of fat: saturates, monounsaturates and polyunsaturates.

Most of us know that we should be cutting down on fat. But it's even more important to try to replace the saturated fat we eat with unsaturated fat.

Saturated fat

Can raise blood cholesterol levels, which increases the chance of developing heart disease.

Monounsaturates and polyunsaturates

Are both types of unsaturated fat. Unsaturated fats provide essential fatty acids that the body needs.

This means you could consider:

- using unsaturated oils such as olive, sunflower or rapeseed oils instead of butter lard and ghee in cooking
- making your mashed potato with olive oil and garlic instead of butter and milk
- choosing a fat spread high in unsaturates instead of using butter

The following are all high in unsaturated fat: oily fish; avocados; nuts and seeds; oil and spreads made from sunflower, rapeseed and olive; and vegetable oils.

You could also opt for some oily fish instead of sausages or a meat pie, and try snacking on unsalted nuts or dry roasted seeds instead of a biscuit, or try other lower fat snacks – such as fruit.

Dietary Fibre

Most people don't eat enough fibre. Because we digest them more slowly, fibre-rich foods can help make us feel full for longer. So try to include a variety of fibre-rich foods in your diet.

There are two types of fibre:

Insoluble fibre

This is fibre that the body can't digest, so it passes through the gut, helping other food and waste products move through the gut more easily. Insoluble fibre helps to keep our bowels healthy and stop constipation. And this means we are less likely to get some common gut disorders. Wholegrain bread, brown rice, wholegrain breakfast cereals and fruit and vegetables all contain this type of fibre.

Soluble fibre

This fibre can be partially digested and may help to reduce the amount of cholesterol in the blood. Particularly good sources of soluble fibre include oats, and pulses such as beans and lentils.

Sodium and salt

Salt is often listed on food labels as sodium. Salt is made up of sodium and chloride. And it's the sodium in salt that can be bad for your health. Salt = sodium x 2.5

Adults should have no more than 6g of salt or about 2.5g of sodium a day.

Eating too much salt can raise blood pressure. And people with high blood pressure are three times more likely to develop heart disease or have a stroke than people with normal blood pressure. As three-quarters (75%) of the salt we eat comes from manufactured food. It's a good idea to check food labels so you can compare products and choose those with less salt in them

Nutrition during injury

It is highly possible that at some point during your sporting career, an injury will happen. It is important to know what to do to maximise recovery if this happens.

How nutrition can help?

Nutrition can play a very important part in the recovery process. An injury is added stress to the body so eating a diet rich in the nutrients required for healing can optimise the healing process. Some of the major nutrients involved in the healing process include protein, vitamin C, zinc and iron.

Protein

Protein in our daily diet is broken down into amino acids which are building blocks for construction of protein in the body such as muscle, collagen, hormones, enzymes etc. It makes sense therefore that the healing process can be affected by the amount of protein that you eat. Protein requirements for optimum healing are in the region of 1.2 – 2.0g /kg body weight i.e. for a 65kg person this would be

78 – 130g per day. It's important therefore that during injury you ensure you are eating sufficient protein.

| Food | Portion size | Protein (g) |
|----------------|----------------------------|-------------|
| Milk | 1/2 pint | 9.7 |
| Cheddar cheese | Matchbox sized piece (30g) | 7.7 |
| Cottage cheese | Small pot (112g) | 15.5 |
| Yoghurt | Medium pot (150g) | 6.1 |
| Red meat | 2-3 thin slices | 24 |
| Chicken | 2 slices | 26.8 |
| White fish | Medium fillet | 27.9 |
| Tuna | Small tin (100g) | 23.5 |
| Eggs | 2 average | 12.5 |
| Quorn | 120g | 14.2 |
| Nuts - mixed | 30g | 6.9 |

Vitamin C

Vitamin C is essential for wound healing as it has key role in the formation of collagen. Deficiency of vitamin C can cause delayed wound healing due to the capillaries and connective tissue at the wound site being too fragile and so new scar tissue cannot adequately be formed. The recommended nutrient intake for vitamin C is 40mg/day but it may be beneficial to have more than this when trying to optimise recovery. Vitamin C is found in virtually all fruit and vegetables. Remember to eat fruit and vegetables within a few days of buying them as vitamin content reduces with time. Also, store in a cool, dark place and stir-fry, steam or microwave vegetables to retain more nutrients.

| Food | Vitamin C content (mg) |
|-----------------------------------|------------------------|
| 200ml (medium glass) orange juice | 78 |
| 200ml cranberry juice | 60 |
| 1 medium orange | 86 |
| Portion strawberries (120g) | 922 |
| 2 spears broccoli (boiled) | 40 |
| 1/2 red pepper | 112 |
| 1 medium tomato | 14 |
| 1 kiwi fruit | 35 |
| 1/4 bunch watercress | 12 |

Zinc

Zinc is involved in DNA synthesis, RNA synthesis, protein synthesis, energy metabolism and immune system function and is essential for overall cell function. Wound healing involves cell growth and so zinc is crucial to the healing process. Zinc also plays a role in bone healing and studies suggest that zinc deficiency plays a major factor in bone density loss after immobilisation following injury. The recommended nutrient intake for zinc is 9.5mg per day for men and 7.0mg per day for women. Studies have shown that in people with adequate zinc status supplementing with additional zinc does not accelerate wound healing. However, in those who are deficient, supplementing with zinc does speed up the wound healing process. As it is impossible to know what your zinc status is without doing a blood test it is wise to eat foods rich in zinc if you have an injury.

| Food | Zinc content (mg) |
|--------------------------------------|-------------------|
| Oysters, raw (100g) | 59.2 |
| 180g lean beef fillet steak, grilled | 9.4 |
| 150g chicken breast | 1.2 |
| Quorn 100g | 7.5 |
| Prawns 100g | 2.2 |
| 2 medium slices wholemeal bread | 1.2 |
| 2 average eggs | 1.3 |
| Pumpkin seeds 30g | 1.98 |
| 1/2 pint milk | 1.17 |

Calcium & Vitamin D

Calcium is an important mineral for bone structure and deficiencies are associated with increased skeletal weakness. Adequate calcium intake is required to achieve peak bone mass which is an important factor for determining risk of osteoporotic fracture in later life. No conclusion has been drawn whether calcium supplementation will reduce risk of fracture or not however it makes sense to include good sources of calcium in your diet to achieve peak bone mass. If you do break a bone or suffer from a stress fracture there is little evidence that taking a high dose calcium supplement will make much difference, but you should ensure an adequate intake of calcium from your diet. The recommended nutrient intake for calcium is 700mg per day, and the National Osteoporosis Society recommends 1200mg per day for those with osteoporosis. Good sources of calcium include dairy foods, green leafy vegetables, canned sardines, canned mackerel in tomato sauce, canned salmon (flesh & bone), tofu, nuts, sesame seeds, sunflower seeds, dried figs, Vitamin D is vital for the absorption of calcium and a deficiency will reduce the amount of calcium that can be absorbed. Sunlight is the major source of vitamin D as it is made in the skin on exposure to UV light. Food sources include fish liver oil, oily fish, egg yolk and fortified margarine.

Weight management during injury

As well as ensuring a good intake of the specific nutrients involved in the healing process it is important to maintain a good healthy balanced diet with sufficient energy. Having said that, unless the trauma is severe there will be little change to the energy requirements for healing to occur and in most instances energy intake should be less than normal because of the reduction in activity levels. Many injured athletes find they gain weight during their time off injured and then have to shift the weight when they come back to training which makes it twice as hard.

Eating Out Guide

| Type of restaurant | Best choices | Worst choices |
|--|--|---|
| Indian  | Chapatti, plain naan Chicken tikka Tandoori dishes Chickpea dishes Lentil dishes (e.g. Dahl) Dry vegetable curries Vegetable side dishes | Samosas Anything fried Most meat curries and biryanis Anything in a korma, pasanda or masala sauce Roghan josh |
| Chinese  | Soup Vegetable, chicken or prawn chop suey Sweet and sour vegetables Stir-fried vegetables Rice and noodles | Peking duck Sweet and sour pork Spare ribs Prawn crackers Fried noodles |
| Pizza/Italian  | Pasta with tomato/vegetable/seafood based sauces Pasta filled with spinach/ricotta Gnocchi with tomato based sauce Pizza with vegetable topping Salad: tomatoes, avocado, olives Vegetable risottos | Pasta with creamy/buttery sauces Pasta with bolognese sauce Lasagne (meat) Pizza with meat, pepperoni, salami or extra cheese toppings Garlic bread, dough sticks |
| Fast food  | Plain grilled hamburger Flame grilled chicken Salad Milkshake | Large/quarterpounder hamburgers Chicken burgers Chips/fries Anything fried Doughnuts Apple pies |
| Greek  | Greek salad Tomato or cucumber salad Tzatziki and pitta bread Hummus Grilled fish Dolmades Stuffed tomatoes Fresh fruit | Mousakka Taramasalata Lamb dishes Kefthethakia (meat balls) Baklava |
| French  | Consommé Ratatouille Salads (e.g. Nicoise) Vegetable dishes Grilled chicken or fish | Anything in a creamy or buttery sauce Pastry dishes |
| Mexican  | Guacamole Bean burritos, tortillas Vegetable fajitas Tostadas with beans or vegetables Vegetable chilli | Tortilla chips Potato skins Beef chilli Tortillas/burritos with meat Chimichangas |

Resources

Online Resources

Food Standards Agency
www.eatwell.gov.uk

AIS – Australian Institute of Sport
www.ais.org.au

Lucozade Sport Science Academy
www.thelssa.com

Glycaemic Index
www.glycemicindex.com

Dieticians in Sport and Exercise Nutrition
www.disen.org

British Nutrition Foundation
www.nutrition.org.uk

Useful Books

Bean, A. 2006. The complete guide to sports nutrition. 5th ed. A & C Black.

Bean, A. 2002. Food for fitness. 2nd ed. A & C Black.

Maughan, R and Burke, L. 2002. Sports Nutrition. Blackwell Publishing.

Recipes

Meals

Spicy Bean Lasagne
Chicken and Pepper Risotto
Tangy Salmon Fish Cakes

Snacks

Banana Bars
Oaty Fruit Bars

Smoothies

Banana and Pear Smoothie
Banana and Orange Smoothie
Strawberry and Cranberry Smoothie

Meals

Spicy Bean Lasagne

Serves 4

1 onion, chopped
2 tbs olive oil
1 tbs each cumin & coriander
2 tin (240g each) borlotti beans, drained
1 tin chopped tomatoes
12 sheets lasagne
350g cottage cheese
40g reduced fat mozzarella

1. For the spicy beans, heat the oil in a pan and sauté the onion and spices for 5 minutes
2. Add the beans and tomatoes, bring to the boil and cook for a few more minutes
3. Spray a baking dish with oil spray or coat lightly with a little oil.
4. Place 3 sheets of lasagne on the bottom of the dish and cover with one quarter of the beans and one quarter of the cottage cheese. Repeat the layers, finishing with the beans and cottage cheese.
5. Sprinkle with the mozzarella and bake at 180C/350F/gas mark 4 for 30 minutes. Alternatively, microwave for 8 minutes.

Instead of borlotti beans you can use red kidney beans or tinned green lentils.

Nutrition at a glance (per serving)
Energy 626kcal
Protein 39g
Fat 9.4g
Carbohydrate 103g
Fibre 15g

Chicken & Pepper Risotto

Serves 4

2 litres (3 1/2 pints) chicken or vegetable stock
350g (12 oz) white rice
2 peppers, preferably one red, one yellow, cut into thin strips
100g (4oz) cooked chicken, chopped
25g (1oz) parmesan, grated
Handful of fresh chives or parsley, if available

1. Place the stock, rice and peppers in a large saucepan.
2. Bring to the boil and simmer for 12-15 minutes, until the rice is tender and the liquid had been absorbed.
3. Add the chicken and half the parmesan. Heat through for a few minutes.
4. Serve topped with remaining parmesan and herbs.

You can use tinned tuna or cooked turkey instead of chicken

Nutrition at a glance (per serving)
Energy 438kcal
Protein 19g
Fat 7g
Carbohydrate 80g
Fibre 1.7g

Tangy Salmon Fish Cakes

Serves 2

100g (4oz) instant mashed potato (dried weight)
200g (7oz) can pink salmon, drained and bones removed
Grated rind of half a lemon
1 tbsp chopped parsley
Salt and pepper
1 egg beaten
3 slices of wholemeal bread made into breadcrumbs

1. Make up the instant mashed potato following instructions on packet
2. Add the salmon, lemon, parsley and season to taste. Mix well.
3. Form the mixture into rounds or croquette shapes, dip each in egg and bread crumbs and grill until golden, under a moderate grill.

Serve with baked beans or bread.

Nutrition at a glance (per serving)
Energy 460kcal
Protein 33g
Fat 13g
Carbohydrate 57g

Snacks

Oaty Fruit Bars

Makes 16 bars

Preparation Time: 15 minutes
Cooking Time: 35-40 minutes

175g (6oz) porridge oats
175g (6oz) plain white or wholemeal flour
175g (6oz) Demerara sugar
1 tsp mixed spice
225g (8oz) prunes, pureed with 6 tbsp water
1 egg white
100g (4oz) dried apricots
100g (4oz) sultanas
225ml (8 fl oz) orange juice

1. Place the oats, flour, sugar, spice, prune puree and egg white in a large bowl. Combine with a fork or with your hands until you have a rough crumbly mixture.
2. Cook the apricots, sultanas and orange juice in a saucepan for 5 minutes, or until the liquid has been absorbed.
3. Mix the fruit with the oat mixture.
4. Spoon into a 26 x 17 cm (10 x 7 in) baking tin. Bake at 180C/350F/gas mark 4 for 35-40 minutes, until firm and crisp on the surface. When cool, cut into bars.

An ideal post workout snack, these bars are practically fat free and are a great source of iron, vitamin A (beta-carotene) and carbohydrates.

Nutrition at a glance (per serving)
Energy 186kcal
Protein 3.6g
Fat 1.3g
Carbohydrate 43g
Fibre 2.7g

Banana Bars

Makes 10 bars

Preparation Time: 10 minutes
Cooking Time: 25 minutes

75g (3oz) reduced fat polyunsaturated margarine
50g (2oz) soft brown sugar
50g (2oz) plain wholemeal flour
50g (2oz) porridge oat flakes
1 tsp baking powder
2 eggs
3 large bananas, mashed

1. Pre-heat oven to 190°C/375°F/Gas mark 5
2. Place all ingredients in a large bowl and beat vigorously for 3 minutes until blended
3. Turn mixture into a lightly oiled shallow baking tin (20cms/8in square), lined with baking parchment
4. Bake in pre-heated oven for 25 minutes
5. Leave in the tin for 2 minutes then cut into 10 bars and cool on a wire rack



Nutrition at a glance (per serving)
Energy 150kcal
Protein 3g
Fat 5g
Carbohydrate 24g

Smoothies

Strawberry & Cranberry

Serves 2

Preparation time: 5 minutes

1 x 450g pot low fat bio-live strawberry yoghurt
1 tbsp wheat germ
100g (4oz) fresh strawberries, hulled
300ml (1/2 pint) cranberry juice (unsweetened)

1. Blend the yoghurt, wheat germ and strawberries until smooth
2. Gradually add the cranberry juice and mix until combined
3. Pour into two large glasses and chill before serving.



Nutrition at a glance (per serving)

Energy 272kcal
Fat 8g (4g saturated)
Carbohydrate 38g
Fibre 2g

Banana & Pear

Serves 1

Preparation time 10 minutes

1 large ripe banana
1 medium pear
250ml unsweetened apple juice
125ml low fat natural yoghurt

1. Peel and roughly chop the banana and pear.
2. Blend together the banana, pear and apple juice until smooth.
3. Add the yoghurt and blend for a further 30 seconds.
4. Serve chilled



Nutrition at a glance (per serving)

Energy 339kcal
Protein 8.5g
Fat 1.8g
Carbohydrate 77g
Fibre 4g

Orange & Banana

Serves 2

Preparation time: 10 minutes

2 large ripe bananas, chopped
Juice of 4 oranges or 400ml orange juice
Juice of 1 lime or 2 tbsps lime juice
150ml low fat natural yoghurt

1. Blend together the chopped banana and a little of the orange juice and lime juice until smooth.
2. Gradually add the remaining orange and lime juice and yoghurt and continue mixing.
3. Pour into 2 glasses and serve immediately



Nutrition at a glance (per serving)

Energy 286kcal
Protein 7g
Fat 1g
Carbohydrate 64g