001

DOWN TO BASICS

Eating a wide variety of commonly available foods is one of the most effective ways of ensuring we can meet our carbohydrate, protein and fat requirements for general good health – and to operate effectively as athletes.

In this chapter you will find out:

- Good health is highly dependent on a healthy balanced diet – even more so as an athlete!
- As an athlete it is even more essential that you meet your body's needs for nutrients – and you can do this by eating a wide variety of foods. Variety is key
- The body's primary energy fuel is glucose – and carbohydrates, sugars and starches are eventually digested and converted to glucose
- It is important to choose protein-rich foods which can provide all the essential amino acids
- The diet of an athlete requires some dietary fat – in order to provide essential fatty acids and fat soluble-vitamins

001
DOWN TO BASICS

Nutrients that the body needs are provided by the food we eat – but it is important to realise that no one specific food or food group alone is sufficient to provide all the nutrients needed for good health and successful performance out on the road, track or field. Eating a good variety of foods including fruits and vegetables, will play a big part in ensuring there is an adequate supply of vitamins, minerals and dietary fibre.

The energy supply that allows us to run, jump, throw and push is derived from the nutrients found in various foods that we eat. These are broken down in the body and converted to provide energy – a measurement called Kilocalories (kcal). This measurement, which can often be seen on the side of food and drink labels, is used to show how much energy different types of nutrients can provide per gram e.g.

- Carbohydrates can provide 3.75 kcal per gram
- Proteins can provide 4 kcal per gram
- Fat can provide 9 kcal per gram
- Alcohol can provide 7 kcal per gram

A BIT ABOUT CARBOHYDRATES

Dietary carbohydrate can be found in a wide variety of carbohydrate-rich food and drink. Both types of carbohydrates (sugars and starches) are converted into glucose, which is then absorbed into the blood, providing the primary fuel for the body's energy. Foods high in carbohydrates have a wide variety of metabolic, functional and nutritional features and are best explained by classifying them into three main groups:

1 Monosaccharides: single molecules of sugar. The monosaccharides are:
- glucose – found in most carbohydrate foods including sugars and starches. All

carbohydrates are eventually digested or converted into glucose

- fructose – also known as fruit sugar. This is found in fruits, vegetables and honey and is converted into glucose by the liver
- galactose – this is part of lactose – the sugar that is found in milk

2 Disaccharides: two linked sugar molecules which are broken down by the mono-saccharides by digestion. The disaccharides are:

- sucrose = (glucose + fructose). Sucrose (table sugar) which mainly comes from sugar beet/sugar cane can also be found naturally in all fruits and vegetables and most herbs and spices
- lactose = (glucose + galactose). Lactose is found in milk and milk products
- maltose = (glucose + glucose) maltose is formed when starch is broken down

3 Starches: starch, also known as polysaccharide, is hundreds of molecules of glucose joined together. When starch is digested, it is initially broken down into maltose and then into glucose.

IN SUMMARY

The major differences between sugars and starches is the size of molecule. However, you will find that foods are mainly classed according to the major type of carbohydrate they are made up of. As a result, this has led to the simplistic division of carbohydrate-containing foods into two categories:

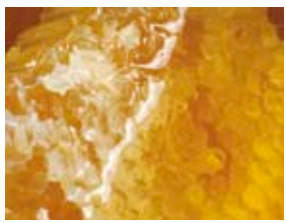
Simple:
mainly consisting of sugars

Complex:
mainly consisting of starches

This over-simplification is confusing as the majority of naturally occurring foods contain a mixture of sugars and starches as well as other nutrients.

As most of the carbohydrates will end up being converted to glucose, it is not accurate to regard one type as "better" than another. Therefore other factors need to be considered – particularly by athletes – as to which carbohydrate may be more practical: e.g. one where the carbohydrate is converted to glucose quickly or one where it takes more time, the type of food you need to consume and where it fits into your training and competition schedule.

Later in this guide you will find more information on how to use carbohydrates effectively to fuel athletics performance and training.



001
DOWN TO BASICS

ABOUT PROTEIN

Protein is essential for living and within the body there is a continual process of protein turnover – they are continually broken down and formed as the body uses it to grow and repair tissue.

The largest store of protein is within your muscle. However there is only a very limited capacity to store newly created proteins – therefore protein intake which is in excess of your body's requirements is broken down to provide energy – or stored as fat or carbohydrate. During digestion, proteins are broken down into smaller units called amino acids which can be further combined into a vast array of different proteins. Our bodies are able to create proteins from amino acids – but there are nine essential amino acids the body is unable to produce so these must be supplied in adequate amounts from our diets.

The semi essential amino acids can be made by the body providing the essential amino acids are present in sufficient amounts within the diet – see table on the right.

WHERE TO FIND IT

Only some foods, known as complete protein foods, contain all the essential amino acids. As a general rule, foods from animal sources contain large amounts of all the essential amino acids, however foods from other sources can be combined with each other to create complete protein foods. Plant products + dairy products = improved protein quality. The table on the right gives examples of protein-rich foods or combinations of foods that provide all the essential amino acids in sufficient amounts.

Later in this guide you will find more information on the protein content of certain foods, the protein needs of an athlete, and also how to address protein requirements in a vegetarian diet.

Essential
Histidine
Isoleucine
Leucine
Lysine
Methionine
Phenylalanine
Threonine
Tryptophan
Valine
Semi essential
Cysteine – needs Methionine
Tyrosine – needs Phenylalanine
Non essential
Alanine
Arginine – essential for infants
Aspartic Acid (Asparagine)
Glutamic Acid (Glutamine)
Glycine
Proline
Serine

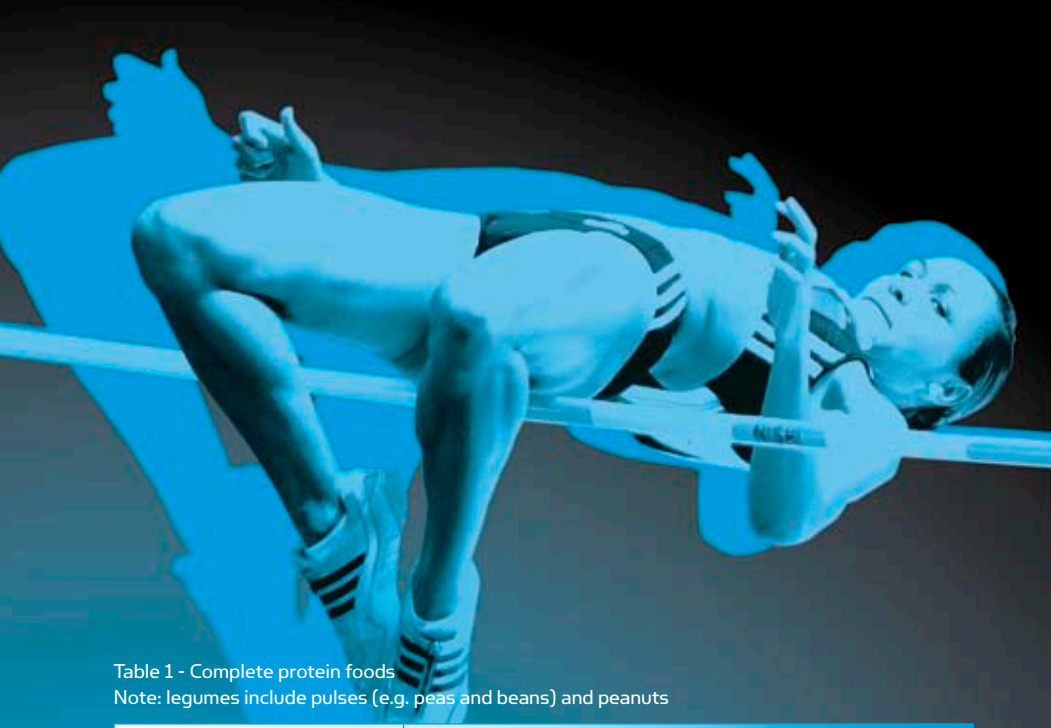


Table 1 - Complete protein foods
Note: legumes include pulses (e.g. peas and beans) and peanuts

Type	Example
Dairy products	Milk, yoghurt
Eggs	Boiled, scrambled, omelette
Fish	Fresh or tinned, e.g. salmon, tuna
Meat and meat products	Beef, lamb, ham, sausages
Poultry	Chicken, turkey
Grains plus legumes	Bean curry or lentils with rice, peanut butter sandwich, bread with hummous, baked beans on toast
Grains plus nuts or seeds	Muesli mix with oats and nuts or seeds, e.g. hazelnuts or sunflower seeds; rice salad with nuts, e.g. walnuts, sesame seed spread (tahini) on bread
Legumes plus nuts or seeds	Mix of peanuts and nuts, e.g. cashews
Grains plus dairy products	Breakfast cereal and milk, rice pudding, pizza or pasta with cheese, cheese sandwich
Legumes plus dairy products	Bean curry in a yoghurt based sauce, bean chilli with cheese

001
DOWN TO BASICS

A MATTER OF FAT

Obviously eating large amounts of fat is not recommended! But fat should be included in our diet to some extent as it can provide us with essential fatty acids and fat soluble vitamins such as Vitamin A, Vitamin D, Vitamin E and Vitamin K.

- Fat can be used as an energy source – it is stored in the muscles.
- It is found in many foods which need to be included in a healthy balanced diet – and avoiding these foods could lead to nutrient deficiencies. e.g. dairy products can be regarded as high in fat – however they are a valuable source of protein, and calcium, not to mention vitamins and minerals.

So... if fat intake needs to be reduced there are ways to consume low fat options – without avoiding the food group completely!

FATTY ACIDS

Dietary fat is composed of three kinds of fatty acids:
Saturated fatty acids (SFA)
Monosaturated fatty acids (MUFA)
Polyunsaturated fatty acids (PUFA)

Typical dietary fat will contain a mixture of both saturated and unsaturated fatty acids (MUFA and PUFA). Different foods have varying levels of fatty acids, but generally:
Meat, dairy products, coconuts =
high in saturated fatty acids (SFA)
Olive oil, rapeseed oils =
high in monosaturated fatty acids (MUFA)
Sunflower oils, Soya oils =
high in polyunsaturated fatty acids (PUFA)

ESSENTIAL FATTY ACIDS (EFA)

Essential fatty acids are a sub group of polyunsaturated fatty acids. Our bodies cannot make these acids and therefore need to be supplied in adequate amounts from within the diet. The two classes of EFA are:

Omega 3 – can be found in:

- Oily fish, e.g. salmon, mackerel, herring, sardine, pilchards and tuna in oil
- Linseed and pumpkin seeds
- Oils, e.g. soyabean and rapeseed oil
- Walnuts
- Sweet potato

Omega 6 – can be found in:

- Seeds, e.g. sunflower and sesame seeds
- Nuts
- Oils, e.g. sunflower oil, safflower oil, corn oil, groundnut oil, sesame oil, rapeseed and soya oils
- Polyunsaturated margarine

Intake of Omega 6 PUFA is required – but not to excessive levels as this can lower the levels of the protective HDL cholesterol! The focus should be mainly on Omega 3 PUFA. General recommendations in this area are that we aim to consume at least two portions of fish per week with one of these portions being oily fish to ensure we provide our bodies with an adequate supply of Omega 3 Essential Fatty Acids.

CHOLESTEROL

Moderate fat diets where the fat is provided predominantly by MUFA and PUFA, and SFA is kept to a low level, can help reduce cholesterol levels – particularly the harmful LDL cholesterol.

A very low fat diet can achieve the same results, however it may also reduce the levels of protective HDL cholesterol.

Down to the fat of the matter...

So, as an athlete, the amount of dietary fat needed will depend on several different factors including:
Age
Gender
Body size
Training levels
Energy requirements

If you decide you need to reduce your fat intake, then there are quite a few adjustments you can make to your everyday habits which will ensure your overall diet remains balanced and is providing all the nutrients your body requires to cope with the training loads you need it to withstand.

Opt for lower fat options – keep dairy products within your diet but opt for semi skimmed milk or low fat yogurts. Change preparation methods – trim the visible fat off meat and choose leaner cuts of meat.
Change cooking methods – grilling instead of frying.
Increasing carbohydrate has been shown to reduce fat intake – however avoid putting butter, cream and cheese on pasta, baked potatoes and bread as this would no doubt raise fat intake once again!

DON'T GET CAUGHT OUT

Food labelling can sometimes be confusing – many foods will be labelled as follows – so make sure you know what they mean:

Fat Free: Something labelled as fat free must contain less than 0.15g of fat per 100g/100ml of the product. E.g. less than 0.15% fat.

Low Fat: A product labelled as low fat must contain less than 3g of fat per 100g/100ml. E.g. less than 3% fat.

Reduced Fat: If food is labelled as reduced fat it must contain at least 25% less fat than the standard product in the same range.

Reduced/low or fat free products do not always equate to low calories! Calories may still need to be considered as some products which may be low fat may still be high in calories e.g. low fat sausages, low fat muffins etc.

Be careful with portion sizes! low fat foods are only effective if you maintain sensible portion sizes.

001
DOWN TO BASICS

LET'S DRINK TO THAT...

As an athlete, it is likely that alcohol will not be a regular feature in your diet. That's not to say it cannot be enjoyed in moderation, but each athlete needs to ask themselves how and when it should be part of their intake – if at all. Many world class athletes completely avoid alcohol, some will use it as an occasional treat. Either way, it is important that as an athlete you can appreciate the facts, so that you can make an informed opinion.

REASONS FOR AVOIDING ALCOHOL

- Long term heavy drinking causes liver damage and other associated problems
- In the short term, excessive amounts can be toxic and endanger the lives of others (e.g. loss of control and irresponsible behaviour such as drink driving)
- Even small amounts can interfere with skilled performance in sport, affecting balance, judgement and strength
- Alcohol causes dehydration and can slow down the process of rehydration
- Alcohol can slow down the rate of tissue repair and growth. Therefore it should be avoided in the immediate aftermath of heavy training or competition and in particular alcohol should be avoided for at least 24-48 hours following any soft tissue injuries
- Alcohol is a high energy – low nutrient food. It is not filling so therefore you will still feel hungry despite having already consumed a high proportion of calories – therefore it may displace other nutrients and cause an increase in body fat

Guidelines exist for sensible drinking to limit health risks associated with alcohol. Quantity guidelines are expressed as units: 1 unit of alcohol = 8g of alcohol equivalent to:

- a single measure of spirit (25ml)
- a 50ml measure of fortified wine e.g. sherry or port
- a 100ml (small glass) of wine
- half a pint of standard strength beer, lager or cider (3.5% alcohol levels)

Current guidelines suggest daily intakes should not exceed 3-4 units for men or 2-3 units for women (and not exceed 1 unit a day for a pregnant woman). Later in this guide you will find information on rehydrating properly following training and competition.

So what have you learned so far?

- Healthy eating is about balance and variety, not good or bad foods
- Every person has different energy requirements which need to be addressed through their dietary choices
- Eat more carbohydrates (especially cereal and starchy sources)
- Eat a moderate amount of protein
- Try to eat at least five portions of fruit and vegetables each day
- Eat less fat, choose lower fat options and the right kinds of fat!
- Try to eat two portions of fish each week – one of which should be oily
- Avoid adding fats to food
- Alcohol should be consumed sensibly, within guidelines... if at all