

Foreword

'Winning the match, beating your opponent or finishing the race in front, all take more than just training. The food that fuels your body is as important as any work-out programme! That's why *The Food of Champions* is invaluable - a perfect guide to the perfect diet. We're not just talking about serious, dedicated athletes but weekend walkers, lunchtime gym goers and those who want to get fit to enjoy amateur sports - whatever they are. To perform at your best you need the best diet.

The *Food of Champions* explains simply and clearly why vegetarian diets beat meat-based diets hands down - and explodes a few myths in the process. Take protein! You can't succeed without masses of protein from meat and dairy! Wrong! The key to success is starchy, complex carbohydrates - things like potatoes, pasta, rice and yams. These are the 'energy' foods and you don't find them in meat. People also get their muscles in a twist. It isn't meaty animal muscles that build human muscle, it's using them that does that.

So where do veggies get their protein? From almost everything they eat! Almost all plant foods contain it, to such a degree that going short is almost an impossibility.

Veggie diets are also jam packed with disease-busting antioxidants, without which your body is open to attack and can't function properly. The champion disease fighters are vitamins C and E and the beta-carotene form of vitamin A - and you'll be hard pushed to find these in meat or dairy. What you will find in them is artery-clogging saturated fat and cholesterol.

The truth is - animal foods harm your body and plant foods protect it. That's why *The Food of Champions* is the perfect guide to being a champion for life.'

Introduction

'A well balanced diet is all that athletes actually require for peak performance' (1). These words come from the most authoritative textbook on human nutrition. So whether you are the sort of person who sloths off to the gym once a week for fear of turning into a blob or the fitness fanatic who puts the rest of us to shame you can be assured that a well-balanced vegetarian diet will easily provide for whatever your favourite sport is. And - no surprise here - there are advantages to you as a veggie compared to your meat-eating opponents!

There are two big health pluses that make a vegetarian or vegan diet worthy of consideration by serious athletes. Firstly, veggie diets are brim full of energy-giving

carbohydrates - 'must-eat' foods for all sporty types. In fact a near-vegetarian diet is often necessary for athletes to take advantage of carbohydrate-rich plant foods such as wholegrain breads, cereals and pasta! Secondly, vegetarian diets are rich in essential nutrients called antioxidants. These vital vitamins help the body cope better when put under stress from exercise (2). Meat and dairy foods contain neither carbohydrates nor the three main antioxidants - beta-carotene, vitamin C and vitamin E. The prestigious *American Journal of Clinical Nutrition* sums it all up nicely in their statement: 'The well-planned vegetarian diet also provides the athlete with adequate levels of all known nutrients while providing added reduction in cardiovascular disease risk factors' (3).

Carbohydrate

Carbohydrates give us the energy we need to move our bodies - be it strolling along the street or running a marathon and are considered by all health advisory bodies to be the most important fuel for high intensity activity and performance. Carbohydrates come in three types - slow-releasing complex starches (examples below), fast-releasing simple sugars (e.g. table sugar and many refined foods) and dietary fibre (the indigestible part of fruits and vegetables, essential for the digestive system to work properly). The World Health Organisation suggest we should all be eating far more carbohydrates (mainly slow-releasing ones) than we do - 55 to 70% of our diet should ideally be made up of them. And guess what - it is widely accepted that vegetarian diets typically contain more carbohydrate than your average omnivorous ones. In most studies, carbohydrate intakes by endurance athletes fall below recommended amounts. A position paper from the world-respected American Dietetic Association states that: '... it is appropriate for much of the additional energy [for athletes] to be supplied as carbohydrate.' And that this come '... from carbohydrate-based food groups (breads, cereals and grains, vegetables, and fruits)' (4). Wholegrain versions tend to be the slowreleasing ones and this is what you need most of for peak, sustained athletic performance. Legumes (pulses) are another source of these complex carbohydrates and include beans of all sorts e.g. baked beans, chickpeas, red kidney beans and soya beans as well as lentils and peas.

Carbohydrates and fat are the two dietary fuels that the body makes use of during exercise. Dietary fat in excess is stored as fatty tissue and, as we all know, unfortunately the body has an unlimited capacity for such storage! Carbohydrates can be stored as either fat or glycogen but there is only a limited amount of glycogen that can be stored - in muscles and the liver. During low intensity exercise such as walking - as well as endurance training - it is fat that will be used which provides a slow and steady stream of energy to the muscles.

During high intensity exercise like sprinting it will be mainly glycogen that is burned for fuel giving the body a quick energy source. As an athlete your main aim is to build up sufficient glycogen reserves in your muscles so that you will be able to work harder for longer. A vegetarian or vegan diet makes this easy since the best way to improve your glycogen stores is to eat a diet high in starchy carbohydrates - as well as follow a good aerobic training program. Current UK guidelines recommend that everyone should aim to be moderately active (e.g. brisk walking, gardening) for at least 30 minutes each day at least five days a week (5). Eating carbohydrate-rich meals regularly throughout the day will easily ensure that all your energy needs are supplied - whatever your favourite activity is. Glycogen reserves will then be sustained as a matter of course - you won't need to worry about them. And the more you exercise the more carbohydrates you will need. Simply increase the size of each meal to satisfy your hunger and maintain your stable weight - what a chore! Snacking - or 'grazing' - is an excellent way to provide extra energy in your diet - stock up on foods like nuts, seeds, dried fruit and wholegrain crackers, dipping in whenever the fancy takes you.

Remember too that your body needs rest as well as workouts so it's just as important to schedule in days when you give in to the urge to sit back and put your feet up!

Protein

Protein is needed for repair of body tissues and cell growth and is made up of many smaller units - building blocks - called amino acids. Contrary to popular opinion you don't build muscle by eating more protein. The belief that eating animal muscle - i.e. meat (and lots of unhealthy fats to boot) - means you automatically build human muscle simply isn't true. Muscles develop by being used not by eating greater amounts of another animals' flesh - you use them or lose them. Look at gorillas - they are without doubt the most muscular of all the primates and their impressive physique comes from regular physical activity and a plant-only diet! Most foods contain some protein. Particularly good sources of protein in vegetarian diets include soya products (like tofu, veggie burgers and soya milk), beans, lentils, nuts, seeds and cereals (e.g. wholegrain bread, pasta and rice). Although athletes need some extra protein this is normally covered by the increased food intake, not by increasing protein foods specifically. By eating more calories - mainly carbohydrates - and keeping dietary protein near 15% of your total energy intake any extra protein needed will be supplied by this increase in amount of food eaten.

Fluids

Fluid intake - mainly water - is the most over-looked but in fact most important element to think about in everyone's life - the exercisers and couch potatoes! Without any form of

exercise a sedentary person living in a cool climate loses about 1.5 litres of fluids per day and an athlete engaging in one hour of heavy exercise can lose between 2-4 litres! Muscular work can be reduced by 20-30% by just a 4-5% loss of body weight - hardly surprising when you consider that muscle tissue is roughly 80-85% water. So how much should you be drinking? The increased fluid needs of your body depends on the type, intensity and duration of your chosen sport, as well as the air temperature (7). However there are a few simple guidelines that will help to ensure your body never becomes dehydrated.

Before exercise:

Drink lots of water before exercise. 24 hours before an exercise session drink plenty of fluids and remain hydrated. Two to three hours before training drink roughly 500ml of fluid gradually over this time.

During exercise:

Drink 150-350ml of fluid at 15-20 minute intervals, beginning at the start of exercise. Plain water is usually sufficient for exercise lasting less than one hour. For exercise periods over an hour you may need to have a bit of extra energy. Choose either a special sports tonic or better still save yourself money and make your own energy-booster drinks. Simply blend 500ml of fruit juice with 500ml of water (6). This will supply the necessary water, sugar (glucose and fructose) and electrolyte minerals (sodium and potassium) together with lots of other vitamins. There is no real need to replace salt during a single exercise session of moderate duration - e.g. less than three to four hours (4). However you can simply add one quarter level teaspoon of salt to your home-made fruit drink if required (6).

The most important message here is to drink plenty of water before, during and after exercise - if you feel thirsty you are already dehydrated! But don't go mad and drink too much either.

Fats

We all need some fat in our diets to supply around 20-30% of our energy but too much makes you - fat! Fats in the diet come in two forms - saturated and unsaturated. What we don't need in the diet is the nonessential saturated fats which come mainly from meat, dairy and processed foods. These increase cholesterol levels and can lead to heart disease and some cancers. What we do need in the diet are the unsaturated, so-called essential fats. Vegetarian and vegan diets are rich in these essential fats - found abundantly in seeds, nuts, beans, avocados and vegetable oils. Animal-free margarines are also a source of essential fats but make sure only non-hydrogenated ones are used. Hydrogenated fats act in a similarly harmful way as saturated fats do in the

body. A process known as hydrogenation is used on liquid vegetable oils to turn them into hard fats, giving spreadable margarines. The fat produced is called trans-fat but the body cannot make use of it. Worse still it blocks the body's ability to use the essential fats your body does need. Choose margarines with labels which state they use only 'non-hydrogenated fats'. Many processed foods also contain these unhealthy trans-fats - in chips, crisps and many pastry products - so it's best to limit these in your diet.

Vitamins

Antioxidants

Recently there has been lots of interest in the science behind free radicals. These are disease-promoting molecules produced by, for example, pollution, cigarette smoking and cooking - especially cooking meat. Free radicals are also produced actually inside the body as a by-product of normal biological functions such as digestion and breathing. Physical exertion - being as it is simply another biological process - also produces these free radicals. Antioxidants are the only known chemicals that provide a powerful defense against these harmful molecules. And guess what again? Yep, a vegetarian diet is absolutely chock-full with these little wonders as they are mainly found in fresh fruits, vegetables, seeds, nuts, beans and wholegrains! And three of the most important ones are only found in plant foods. We're talking vitamins C, E and beta-carotene (the antioxidant form of vitamin A). None of these essentials in the diet come from eating dead flesh. No surprise then that a recent study found vegetarians had higher levels of antioxidants vitamin C, vitamin E and beta-carotene than meat eaters (8). Everyone - but even more so sportspeople - should eat foods rich in these vitamins. Brightly coloured fruits and vegetables - particularly red, green and orange ones - are very rich sources. Choose from tomatoes, carrots, dark green leafy vegetables (e.g. broccoli, watercress), oranges, apricots, grapes, sweet potato, avocados, peppers, kiwi fruits .. the list goes on and on! Eat them raw, steamed, grilled and even lightly boiled. The beta-carotene in carrots and lycopene (another antioxidant) in tomatoes is actually better absorbed in your body if these vegetables are cooked first.

So it's easy to see that as a vegetarian athlete with high intakes of these sorts of foods your body has a special advantage - it will be much better equipped to deal with the damaging free radicals.

The B-Vitamins

This group of vitamins include vitamin B1 (thiamin), B2 (riboflavin), niacin, B6 (pyridoxine), folic acid and vitamin B12 (cobalamin). Vitamins B1, B2, niacin and B6 are of special relevance to sportspeople since they are all involved in releasing energy from food. Ensuring adequate supplies in a

vegetarian diet is no problem whatsoever. They are widely available in wholegrains including wholemeal bread, brown rice and wholemeal pasta, yeast extracts, pulses (beans, lentils) nuts, seeds, dark green leafy vegetables, avocados and bananas. Many breakfast cereals are also fortified with the entire vitamin B group. Folic acid is needed for many processes in the body including protein synthesis and blood formation. Most vegetables contain some, especially dark green leafy vegetables, nuts, pulses and avocados. Vitamin B12 (cobalamin) is required for the maintenance of a healthy nervous system and normal blood formation. The liver has stores of B12 lasting up to three years and the body is also very efficient at reabsorbing it. This vitamin is found in dairy products and free-range eggs. Vegans can obtain B12 by making sure they include a wide range of B12-fortified products such as breakfast cereals, yeast extracts, some margarines and soya milk in their daily diet (or by taking a vitamin B12 supplement). Vitamins B6, B12 and folic acid are also necessary for keeping the arteries healthy.

Minerals

Iron and Zinc

Iron and zinc are two very important minerals and are found in many common vegetarian foods. Iron is a vital component of haemoglobin found in red blood cells which transports oxygen around the body. A lack of iron can cause iron-deficiency anaemia but leading advisory bodies such as the British Medical Association state that iron deficiency is no more common in vegetarians than in meat-eaters (9). There is also some evidence that a diet high in iron from meat may actually cause disease! Good sources of iron include wholemeal bread, pulses (e.g. baked beans, soya beans, chickpeas, red kidney beans, lentils and peas) dried fruits (particularly figs and apricots), black treacle and dark green leafy vegetables. Since vitamin C helps the body absorb iron better, a good habit to get into is to take these iron rich foods with fruits and vegetables. Having a glass of fresh orange juice with your meal or fruit for afters should do the trick. And be wary of drinking cow's milk with a meal containing food high in iron - the calcium in dairy foods can also reduce the amount of iron the body absorbs. Zinc is found in seeds, nuts, wholegrains and pulses. Its main role is in the protection and repair of DNA.

Calcium and Bone Health

We take them for granted but having healthy bones is the cornerstone for leading an active life. Just imagine how restrictive it would be if you broke a leg and couldn't get around unaided? Making sure bones are strong and stay that way is an important consideration for everyone - athletes, non-athletes, males and females alike. Osteoporosis is a condition in which bones become very fragile and can even break. Although this disease generally occurs in the latter

half of life there are simple steps that need to be taken in early life to reduce the risks of it developing. Everyone should ensure they do some form of weight-bearing exercise - and you don't have to go to the gym to do this. For the more athletically-challenged activities like walking, climbing stairs or push-ups all help to increase the strength of your bones. Better still carry a load when you walk - how about carrying your shopping bag (full of delicious vegetarian fare!) home, instead of getting in the car or bus? Skipping or using a couple of dumbbells for specific leg and arm exercises are also great ways to give your bones a good workout. Again it's a bit like muscle - bones need to be used regularly to ensure they remain strong and healthy. And the earlier in life you start the better.

Bones of course also need an adequate supply of calcium and will take up this mineral from the diet until your mid-thirties. Dairy products are not the only source of calcium - and of course they come loaded with non-essential saturated fat and cholesterol. Animal protein from meat and dairy foods encourages calcium to be withdrawn from the bones but vegetable sources of protein don't have this effect nearly so much. Calcium-rich plant foods include dark green leafy vegetables (e.g. broccoli, parsley, Brussels sprouts, watercress) as well as tofu, dried fruits (especially figs), seeds (especially sesame seeds), nuts (especially almonds) and tahini (sesame seed paste). You can even get orange juice and bottled water enriched with calcium. Vitamin D from sunlight and fortified foods such as cereals and margarines help the body absorb the calcium from the diet - what better excuse to get out for some fresh air? Non-dairy sources of calcium - like most plant foods - also have the added advantage of supplying another vital mineral for bones - magnesium.

Sport Supplements

The marketing of ergogenic aids - foods and drinks which claim to increase your sporting performance and prowess - is a huge multimillion dollar industry. The science behind the many claims made - such as increasing muscle mass, greater stamina, enhanced performance etc - is inconclusive and further research is needed. A good exercise program, together with a well balanced vegetarian diet will provide your body with all the essential ingredients it needs for peak performance. You can probably think of better ways to spend your money without being swayed by the lure of clever and seductive marketing techniques!

Vegetarian Fare - Vital Foods for Athletes

As this guide shows you, a balanced and varied vegetarian diet is more than able to provide all the nutrients - like protein, minerals and vitamins - your body requires. It is also the diet that may well confer significant advantages over a meat-based one, mainly from greater starchy carbohydrate and antioxidant vitamin intakes. Meat and cow's milk contain none of the antioxidants beta-carotene, vitamin C and E, no vitamin K, no complex carbohydrate and no fibre. Meat contains no calcium or vitamin D either. What meat and cow's milk do contain are lots of artery clogging saturated fat and cholesterol and are totally inessential in the diet. What is essential in the diet are fresh fruits and vegetables, nuts, seeds, pulses and wholegrains - all components of good plant-based veggie and vegan diets. Enjoy!

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