

GOING FOR GOLD: HOW NATURE CAN BOOST NATURAL ABILITY

The countdown to the 2012 Olympics is now on its final stretch with Britain - and the world - gearing up for what is expected to be one of the greatest showcases of athletic brilliance.

To even be considered for a nation's Olympic team, competitors will not only be hugely talented and naturally gifted in their sport, but will also have had a lifetime of training and experience. Such is the towering pressure to succeed that Olympians must seize every opportunity they can to gain the edge. Training is only part of the battle - the very best athletes know that they also need to be both mentally and physically in peak condition. To achieve this, the body needs a wide range of nutrients, especially if an athlete is to cope with punishing training regimes and competition.



Supplementation with products made from natural ingredients can play a pivotal role here, helping bridge any nutrient shortfall in the diet or from extreme training. Indeed, natural ingredients can go a stage further, helping to boost the body's natural athletic and sporting capability with benefits thought to include increased concentration, strength and endurance.

Supplements can effectively help to build muscle mass and support fat loss, and improve both stamina and athletic performance. This means they can train more often and push their bodies harder to get a better result. Natural supplements can also help with post-exercise recovery, reducing the impact of injuries and improving healing.

But nutrition and supplementation isn't just for top athletes. Anyone who plays sport or exercises regularly - at whatever level - can also get a significant improvement, helping increase their performance but also just as importantly, their enjoyment.

The intense pressure at top level athletics to beat the competition has led to some competitors using manufactured drugs and stimulants that are banned by the sports and athletics governing bodies. However, they run the very real risk of being found out and banned from competition, as well as jeopardising their health because of serious side effects.

Supplements made from natural ingredients are a much better option as they gently work with the body to produce significant but safe results. With properly sourced ingredients and professionally manufactured products, these supplements do not fall foul of doping regulations and are allowed - and often encouraged - by trainers and sports and athletics governing bodies.

At the last Olympics in Beijing, an estimated 90 per cent of the 11,000 athletes used supplements of some kind, according to the European Specialist Sports Nutrition Alliance. In addition, any fears of supplements causing unwanted reactions or problems with dope testing were completely unfounded.

Welcome to the latest issue of Synergy

In this issue we look at how supplements made from natural ingredients can help athletes and sports people reach - and exceed - their performance goals. With competition incredibly fierce at the top level, it's no surprise that athletes want to find ways of boosting their natural talent without resorting to the quick-fix of using banned substances - such as steroids - to achieve short-term performance gains. However, athletes not only risk being banned if caught in a dope test, but taking these illegal substances can also seriously damage their health. There is a far better, gentler and safer way to gain a very real advantage. Supplements made from natural ingredients work with the body to nourish it and gently support it, both physically and mentally. These ingredients are nature's way of helping boost muscle strength and tone, increase endurance and stamina, quicken recovery and help create an agile, alert mind with a positive attitude. While top-level athletes can certainly benefit from supplements, the same applies to anyone involved in exercise, training and sports at any level, from the occasional jogger to the professional football player. In this issue we feature a roundup of some of the best ingredients to aid nutrition and give sports people and athletes a mental and physical boost. Look out for the next issue of Synergy as well as we will be continuing the sports nutrition theme in relation to exercise and sport.

The market for sports and athletics supplements is already large but is growing strongly as consumer awareness and demand increases. Researchers have estimated that the market in Europe is worth more than £4bn euros (about £3.4bn), with similarly strong figures for the United States. Canada, Japan, South America and Asia are also key - and growing - markets.

Natural supplements for sports people and athletes can come in a variety of forms, including tablets, capsules, liquids and powders. Ease of use is key for many consumers, especially those at the keep fit and exercise end of the market looking for straightforward dosages and product information. Supplements can also be incorporated into powdered milkshakes, other drinks and food bars to further increase usability and availability. Sports supplementation is a huge and exciting area that looks set for continued growth for many years to come. Turn to pages two and three to see which natural ingredients can help athletes, sports people and anyone serious about their training and exercise.

In the next issue of Synergy we will be returning to the topic of sports supplementation again, looking at even more aspects and ingredients in this fascinating area.





ATHLETIC EXCELLENCE:

NATURALLY BOOSTING THE BODY'S POWER, STRENGTH AND ENDURANCE

Essential nutrients for athletes

Because of shortfalls in their diet, many people can benefit from additional supplementation of a host of vital nutrients. But for those involved in frequent and rigorous exercise, the demands placed on the body are such that gaps in nutrition can pose a serious problem. Supplementation can help boost general health as well as improve performance.

Vitamins C and E are popular with sports people and athletes because of their antioxidant properties, helping to mop up damaging free radicals formed as a natural by-product of metabolism. It's thought that an increase in training stress - such as preparation for a big race - can trigger an increase in free radicals and that antioxidant supplementation could curb the damage until the body adapts to the new challenge. As well as increases in training, other times when antioxidants can be especially beneficial include when athletes are moving to hot, high altitude or polluted environments for competition, training or acclimatisation.

Coenzyme Q10 - usually known as **CoQ10** - is a vitamin-like chemical that occurs naturally throughout the body and is essential for the health and function of all tissues and organs. It plays a vital role in the function of mitochondria, the energy factories of human cells by initiating and transporting energy

within cells and so has very real significance for athletes and sports people.

While the body manufactures its own CoQ10, it can be hard to get the required amounts, especially as we get older - CoQ10 levels peak at the age of 20 and start to decline thereafter. In one study of 25 top-level Finnish cross-country skiers, 94 per cent of participants said that CoQ10 supplementation improved their performance and recovery time compared with just 33 per cent of those who took a placebo.

Heavy exercisers burning through large numbers of calories need this energy conversion, storage and utilisation process to be as smooth and efficient as possible.

Chromium is necessary, among other things, for the breakdown of protein, fat, and carbohydrates. People who exercise or train a lot are thought to be especially vulnerable to chromium deficiency, and this can lead to an impaired insulin function. Athletes are thought to have an increased requirement for chromium.

Similarly **potassium** is important for the energy conversion of glucose to glycogen and **magnesium** helps the storage and release of glycogen and has a reputation for combating physical stress.

A good intake of **amino acids** - the building blocks

of protein - is crucial for stimulating and supporting maximum muscle growth. Certain amino acids are considered especially important, including **glutamine, arginine, leucine, isoleucine** and **valine**.

Glutamine supplementation in particular is important for athletes as low levels can lead to muscle breakdown and other significant health problems. It is commonly stored in muscles and released into the blood stream during times of physical stress - such as intense and prolonged exercise such as training for marathons. Researchers have found that glutamine supplements can help maintain muscle mass by preventing protein breakdown and improving glycogen synthesis, so increasing the stores of glycogen in muscles.

A deficiency in glutamine from heavy training can lead to a suppressed immune system and a greater chance of picking up infections - thought to be the reason why many marathon runners develop a cold following a race. Clinical studies have shown that glutamine supplements can reduce the risk of illness and infection in endurance athletes or those involved in very heavy training.

Another important nutrient for athletes is **carnitine**, which helps transport fatty acids into the mitochondria energy producing units in cells for energy conversion for muscles. The nutrient is also linked with promoting

heart health and helping the body maintain high energy levels.

The **vitamin B complex** family is known for its role in energy production, and in particular **biotin, vitamin B12** and **folic acid** supplementation is thought to help fight fatigue and tiredness and boost energy levels.

Calcium is crucial for strong bones and proper muscle function – needed by all sports people – and all too frequently levels in the body can be low because of low dairy food intake, with female athletes shown to be most at risk.

Good levels of **iron** are crucial for healthy red blood cells to carry oxygen to the muscles and vital organs. Iron deficiency can cripple athletic performance by triggering fatigue and premature tiredness, as well as dizziness, irritability and a lack of appetite. Female athletes are especially prone to iron deficiency because of blood loss during their monthly cycle, and vegetarians and heavy exercisers are also more likely to have lower iron levels.

Better mental discipline

Mind over matter can easily make the difference between coming first and last. Better memory and concentration will help with learning new techniques and skills while a sharp mind and conditioned nervous system will boost alertness and response times. Staying positive is also crucial, especially when facing defeat or a poor performance.

Most people do not get enough **omega-3 essential fatty acids** (EFAs) from their diet because of a short-fall in oily fish consumption, and athletes and sports people have an even greater need, especially if their diet is heavily loaded with carbohydrates.

Studies have shown that the key active ingredients in the oils – omega-3 essential fatty acids – are crucial for good brain function and have been shown to help boost concentration and improve cognitive performance. Omega-3s can also reduce tension, stress and anger – all essential if sports people are to keep their cool in the face of adversity.

Phosphatidylserine – also commonly known as **PS** – is a type of lipid found in every body cell and in particularly high concentrations in the brain. It plays a critical role in supporting nerve tissue by helping the release of neurotransmitters, keeping the memory-related pathways functioning smoothly. It's thought that a PS supplement can reduce levels of the stress hormone cortisol as well as enhance the sense of well-being. Elevated cortisol levels promote accumulation of fat and muscle breakdown – interfering with exercise and training – so the supplement has an added advantage for sports people. The PS effect may also help enhance recovery and repair of tissue, particularly following intense exercise or a sports or training injury. Both PS and omega-3s are ideal partners and have been shown to work synergistically together to support the brain and encourage better cognitive performance, mood, concentration and memory.

Ginkgo biloba, often called the 'brain herb', works by increasing oxygen flow to the brain and by protecting it from damaging free-radicals and has

a powerful reputation as a memory and cognition booster.

Ginseng can help concentration by targeting neurotransmitters in the brain, and researchers have found that by combining both ginkgo and ginseng, the results can be even more useful. Another natural brain booster is **soya**, rich in plant oestrogens which are known to stimulate neurotransmitters and improve memory. Soya is also thought to help the brain blood supply.

Research by psychologists at the University of Northumbria has shown that essential oils made from **rosemary** boosted alertness and improved memory by about 15 per cent and **peppermint** and **lemon balm oils** are thought to have a similar effect.

Rhodiola, a native herb of eastern Siberia, is another stress-buster. Russian research has shown it promotes production of serotonin, the 'feel good' hormone, and stabilises the adrenal hormones.

Skullcap, motherwort, lavender and **chamomile** all have a calming effect, while **passionflower** is used to help remove feelings of nervousness and panic. These can all help dealing with nervous tension that many sports people may experience before a game or competition.

Wild oats are traditionally used in many cultures as a nerve tonic and anti-depressant, particularly in combating the mental exhaustion experienced during depression. A chemical called **5-Hydroxytryptophan (5-HTP)**, derived from the amino acid L-tryptophan, is believed to improve mood by stimulating serotonin production in the brain.

efficient as possible. Natural supplements can play a huge part in this process, as well as improving and conditioning muscles and increasing stamina and strength.

As we have seen, good nutrition or supplementation with nutrients such as the **B vitamins, vitamin C, iron, zinc** can all help in converting food into energy. **Chromium** is often cited as an ingredient in dieting supplements as it is important for glucose metabolism. Similarly **potassium** is necessary for the energy conversion of glucose to glycogen – the main fuel for aerobic exercise – and **magnesium** helps the storage and release of glycogen. **Pyruvate**, a compound naturally occurring in the body, is also used to help convert blood sugar into glycogen.

Ginseng has been used for thousands of years as a tonic to improve overall wellbeing, performance and stamina – it is thought to work by gently stimulating the pituitary and adrenal glands. Some studies have suggested that ginseng could improve the efficiency of oxygen use by muscles.

Pfaffia, also known as Brazilian ginseng or suma, is reckoned to boost energy by helping the nerve and glandular functions and balancing the endocrine system. Some athletes have taken Pfaffia to naturally increase muscle-building and endurance.

Colostrum is the first milk produced by female mammals after giving birth and it is a rich source of proteins, immunoglobulins, vitamins and minerals. The substance – usually taken in tablet form and from bovine or goat sources – is considered by many to be a valuable aid for athletes.



St John's Wort remains one of the most popular and powerful – herbs for mood boosting, and its properties are backed up by many trials. One German study found that the remedy was even more effective than a conventional anti-depressant drug in treating moderate and severe depression, and had the advantage of fewer side effects.

Boosting physical performance

The aim of every sports person or athlete is to improve their performance. To maximise energy and vitality, the biochemical process of converting food into energy for the muscles has to be as smooth and

Colostrum has been linked with increasing strength and endurance, building lean muscle mass, burning body fat, boosting the immune system, shortening recovery time and accelerating the healing of injuries. A series of studies in Australia found it could significantly improve athletes' running, rowing and cycling performances as well as bring improved recovery after endurance events.

The exact biochemical mechanism behind colostrum is still unclear, but it is thought it boosts levels of the insulin-like growth factor IGF-1, which in turn increases uptake of blood glucose and promotes the transport of glucose to the muscles. Colostrum is also

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thought to help with the creation of lean muscle mass without an increase in the amount of stored fat, as well as aiding the assimilation of nutrients and boosting the immune system to reduce an athlete's risk of falling prey to infection.

Whey protein, a rich source of amino acids, is recognised as a hugely useful ingredient for athletes looking to build muscle tone and strength, as well as improve recovery following exercise or training. Whey protein is a mixture of globular proteins isolated from whey – a liquid by-product of cheese production – and can be digested very quickly, with the protein becoming rapidly available for building muscle tissue.

The supplement can be used after workouts to help increase the levels of amino acids in the blood, which again helps build up muscles mass. During exercise whey protein helps increase blood flow by inhibiting an enzyme which constricts blood vessels, and the improved blood supply helps repair and rebuild muscle tissue. Studies have also suggested that whey protein may have useful anti-inflammatory properties.

Creatine is a natural derivative of an amino acid that is made in the liver, kidneys and pancreas and is also found in some foods, such as meat and fish. Creatine nutritionally supports muscles in manufacturing adenosine triphosphate (ATP), which stores and transports energy in cells. It also helps to build muscle mass and cut recovery time between workouts.

Researchers have shown that creatine supplementation can help improve performance in short-burst activities, with athletes involved in running, cycling and swimming all gaining improvements.

Researchers have shown that **caffeine** can maximise exercise and training results. The substance, which occurs naturally in the leaves, nuts and seeds of a number of plants, works in the body in a number of ways. These include mobilising fats for muscle use, improvements to muscle flexibility, a changed perception of effort and tiredness through the central nervous system and stimulation of the adrenal gland to release adrenaline. There is an increasing body of research underpinning the potential for caffeine to increase both athletic performance and endurance and reduce pain and tiredness during exercise.

Guarana has traditionally been used as a tonic and a stimulant. The herb contains about 15 per cent of the caffeine found in a cup of coffee, but works in a different way. The caffeine is released and absorbed slowly into the body, creating a longer and gentler boost to avoid the side effects of coffee or energy drinks.

The leathery leaves from the **yerba mate** tree have been used in South America for centuries – often as a tea – and the plant has a strong reputation for promoting energy and vitality, probably due to its caffeine content. **Kola nut** is a popular pick-me-up in many West African cultures, with its caffeine content acting as a strong stimulant, helping to ward off tiredness.

Finally, **liquorice** also has a reputation for helping to increase an athlete's energy level by triggering the body's adrenal glands.

RAW MATERIALS KIM WILLEBIUS

Grape seed extract

Grape seed extract contains a compound called oligomeric proanthocyanidins (OPCs) – a type of flavonoid – and these antioxidants are considered to be many times more powerful than vitamins E and C.

It is thought that OPCs strengthen blood vessels and enhance circulation by combating oxidative stress. In this way, grape seed extract is often taken to curb vascular disorders such as heart disease, strokes, high blood pressure and varicose veins.

Grape seed extract's positive effect on the circulatory system has been proven by a body of scientific research. In one study, researchers found that using the extract could cut free radical damage of blood vessels by 85 per cent.

The ingredient might also play a significant part in the fight against cancer and studies show it could help combat cancer cell growth and proliferation as well as trigger cancer cell death. A component of grape seed extract is the antioxidant resveratrol, which is known to have anti-cancer properties.

Grape seed extract may also help vision problems including diabetes-related vision disorders, age-related macular degeneration and cataracts. In addition the compound has been linked with strengthening skin collagen, curbing allergy symptoms by acting as an antihistamine, and reducing pain and inflammation thanks to its prostaglandin-blocking actions.

Quercetin

A plant-derived flavonoid normally found in food such as fruits, vegetables and grains – and particularly in the skins of apples and red onions – quercetin is being investigated for wide range of potential health benefits. As well as its antioxidant ability to mop up free radicals, quercetin is also thought to have a strong anti-inflammatory and anti-viral effect, and also speed up wound healing and recovery. Studies have also shown it could be useful in inhibiting several different types of cancer, including breast, ovarian and leukaemia.

Quercetin's action in curbing mast-cells – cells involved in the inflammatory and allergic reaction processes – means it is linked with helping prostatitis, cystitis, heart disease and respiratory illnesses such as bronchitis and asthma.

The compound may play a part in energy use – tests on lab rats showed it could increase energy expenditure and improve exercise tolerance. One possible theory behind the process is that quercetin stimulates the activity and formation of mitochondria, the so-called cell 'power plants'. Such is the compound's scope for boosting energy, the US military is reportedly looking at giving soldiers the supplement in food bars.

Dong quai

Officially called *Angelica sinensis*, dong quai is also known as 'female' ginseng and is a herb from the celery family native to China, Japan and Korea. A staple of traditional Chinese medicine, dong quai is linked with a number of health benefits, with a reputation for acting both as a general tonic and as balancer and regulator of the female hormone system.

The herb is thought to have several positive effects on the body, including working as a pain killer, anti-inflammatory, antispasmodic, antioxidant and a sedative. Dong quai is often used to help premenstrual syndrome and cramps as well as menopause symptoms. Researchers have found that dong quai root can affect oestrogen and other hormones in animals, and if a similar process occurs in humans this could explain part of its mechanism.

As well as female disorders, dong quai is also used to improve digestion and ease bloating, boost immunity and disease resistance and ease nervous tension – the latter thanks to its magnesium and vitamin B12 content. The herb is thought to boost heart health by helping circulation and coronary function and improving red blood cell production. It can also be used topically as a muscle and joint relaxant to combat tissue inflammation and aches from strain and over-exercise.

* In the next issue of Synergy we explore further the natural ingredients that can help athletes and sports people reach their maximum potential.

Feedback

If you want to discuss any of the ingredients featured in Synergy, please do get in touch. Write to me with your comments on the topics covered and those you want to see discussed in the future

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