



## IMPORTANCE OF VITAMINS MINERALS IN SPORTS PERFORMANCE

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### **Introduction**

Good nutrition is vital for all sports Peron and fitness participant whether u is an Elite athlete or Simple keen to keep fit and healthy. What is eaten on a daily basis affects your energy levels Performance and overall health. A deficiency Particular Nutrient or group of Nutrients can hamper Progress. While an optional Nutritional in table can be a distinct advantage but what is an optional intake for sports? And how can't be achieved without spending a fortune

### **Key Points**

Vitamin and miner requirement depend on age, body size activity level and individual metabolism.

Dietary reference values should be used as a guide For the general population ; they are not targets and do not take account of the needs of athletes

Regular and intone exercise increases the requirements for a number of vitamins and minerals. However, there are no official recommendations for athletes.

Low intakes can adversely affect health and performance However, high intake exceeding requirements will not necessarily improve performance.

A well planned, balanced diet that meets the individual's energy needs, is also likely to provide sufficient vitamins and minerals. Supplements should not take the place of a balanced diet.

Supplements containing 100-200% of the RNI may be useful for athletes consuming less than 200 kcal/day and those with erratic eating habits, food intolerances or a restrictive it (e.g. vean)

Vitamins A, D and B6 and a number of minerals may be toxic in high doses (more than 10x RNI). Indiscriminate supplementation may lead to nutritional imbalances and deficiencies.

Increased free radicals are produced during exercise and may be responsible for post exercise muscle soreness. Excessive amounts may also increase the risk of heart disease, certain cancers and premature ageing

Antioxidant nutrients can help prevent free radical damage. Therefore, a high dietary intake of antioxidant rich foods is recommended: aim for at least 5 portions of fruit and vegetables a day, with moderate amounts of vegetable oils, fish, nuts and red wine

The optimal doses for antioxidant nutrients are unknown and the value of supplements not yet clear

### **1. Vitamin A**

**Functions :-** Essential for normal color vision and for the cells in the eye that enable us to see in dim light; promotes healthy skin and mucous membranes lining the mouth, nose, digestive system, etc.

**Where Found :-** Liver, meat, eggs, whole milk. Cheese, oily fish, butter and margarine

**RNI :-** Men; 700 ug/day, Women; 600 ug/day

**Claims Of Supplements :-** Maintains normal vision, healthy skin, hair and mucous membranes; may help to treat skin problems such as acne and boils; may affect protein manufacture.

**The Science: -** Not involved in energy production; little evidence to suggest it can improve sporting performance.

**Possible Dangers of High Doses :-** Liver toxicity from taking supplements: symptoms include liver and bone damage; abdominal pain; dry skin; double vision; vomiting; hair loss; headaches. May also cause birth defects. Pregnant women should avoid vitamin A supplements and liver. Never exceed 9000 ug/day (men), 7500 ug/day (women).

### **2. Vitamin Beta-Carotene**

Converted into vitamin A (6ug produces 1 ug vitamin A); a powerful antioxidant and free radical scavenger.

**Where Found: -** Brightly colored fruit and vegetables (e.g. carrots, spinach, apricots, tomatoes)

**Rni :-** No official RNI 15-25 mg is suggested intake

**Claims of Supplements: -** Reduces risk of heart disease, cancer and muscle soreness

**The Science:** - As an antioxidant, may help prevent certain cancers. Other arytlenoids in food may also be important

**Possible Dangers of High Doses:** - Orange tinge to the skin-probably harmless and reversible

### **3. Vitamin B1 (Thiamin)**

**Functions:** - Forms a co-enzyme essential for the conversion of carbohydrates into energy; used for the normal functioning of nerves, brain and muscles

**Where Found:** - Whole meal bread and cereals, liver , kidneys , red meat , pulses (beans, lentils and peas)

**Rni :-** Men : 0.4 mg/1000 Calories, Women: 0.4 mg/1000 Calories

**Claims of Supplements:** - May optimize energy production and performance; is usually present with a B complex or multivitamin

**The Science:** - Involved in energy (ATP) production, so the higher the energy expenditure, and the higher the thiamin requirement; increased needs can normally be met in the diet (cereals and other foods high in complex carbohydrates); there is no evidence to suggest that high intakes enhance performance; supplements are probably unnecessary

**Possible Dangers of High Doses:** - Cannot be stored – excess is excreted therefore unlikely to be toxic; symptoms (rare) may include insomnia, rapid pulse, weakness and headaches . Avoid taking more than 3 g/day

### **4. Vitamin B2 (Riboflavin)**

**Functions:** - Required for the conversion of carbohydrates to energy; promotes healthy skin and eyes and normal nerve functions

**Where Found:** - Liver, kidneys, red meat, chicken, milk, yoghurt, cheese, eggs

**Rni :-** Men: 1.3 mg/day, Women: 1.1 mg/day

**Claims of Supplements:** - Sportspeople may need more B2 because they have higher energy needs – supplements may optimize energy productions; usually present within a B complex or multivitamin

**The Science :-** Forms part of the enzymes involved in energy production, so exercise may increase the body's requirements; however, these can usually be met by a balanced diet; there is no evidence that supplements improve performance; if you take the contraceptives pill you may need extra B2

**Possile Dangers of High Doses:** - Rarely toxic as it cannot be stored; any excess is excreted in the urine (a bright yellow color)

## **5. Vitamin B6 (Pyridoxine)**

**Functions:** - Involved in the metabolism of fats, proteins and carbohydrates; promotes normal red blood cell formation; is actively used in many chemical reactions of amino acids and proteins.

**Where Found:** - Liver , nuts ,pulse , eggs, bread , creels , fish , bananas

**Rni :-** Men ; 1.4 mg/day, Women 1.2 mg/day

**Claims of Supplements:** - Sportspeople may need higher doses to meet their increased energy requirements

**The Science :-** Requirement is related to protein intake, so sports- people on high – protein diets may need extra B6 ; endurance work may cause greater – than –normal losses; there is no evidence to suggest that high doses improve performance ; extra doses may help to alleviate PMS (the premenstrual syndrome)

**Possible Dangers of High Doses:** - Excess is excreted in the urine; very high doses (over 2 g/day) may cause numbness and unsteadiness

## **6. Vitamin Folic Acid (B vitamin)**

**Functions:** - Essential in the formation of DNA; necessary for red blood cell manufacture

**Where Found:-**

Liver and offal, green vegetables, yeast extracts wheat germ, pulses

**Rni :-** Men: 200 ug/day, Women: 200 ug/day

**Claims of Supplements:** - Supplements help overall well –being , and also prevent folic acid deficiency and anemia ; these would, in theory , hinder aerobic performance

**The Science:** - No studies have been carried out on athletic performance and folic acid

**Possible Dangers of High Doses:** - Dangers of toxicity are very small, though high doses may reduce zing absorption

## **7 .Vitamin B12**

**Functions:** - Needed for red blood cell manufacture and to prevent some forms of anemia; used in ft, protein and carbohydrate metabolism; promotes growth ad cell development ; needed for normal nerve functions

**Where Found:** - Meat, fish, offal, milk, cheese, yoghurt, vegan sources (fortified foods) are soya protein and milk yeast extract, breakfast cereals

**Rni :-** Men: 105 ug/day, Women: 1.5 ug/day

**Claims of Supplements:-** Since it is involved in the development of red blood cells, the implication is that B12 can improve the body's oxygen carrying capacity (and therefore its

aerobic performance); athletes have been known to use injections of vitamin B12 before competition in the hope that it will improve their endurance; usually present within a B complex or multivitamin

**The Science:** - Extra vitamin B12 has no effect on endurance or strength; there is no benefit to be gained from taking supplements (deficiencies are very rare)

**Possible Dangers of High Doses:** - Excess is excreted in the urine

## **8. Vitamin C**

**Functions :-** Growth and repair of body cells; collagen formation (in connective tissue) and tissue repair; promotes healthy blood vessels , gums and teeth; haemoglobin and red blood cell production; manufacture of adrenalin; powerful antioxidant

**Where Found:** - Fresh fruit (especially citrus), berries and currants, vegetables (especially dark green, leafy vegetables), tomatoes and peppers

**Rni :-** Men : 40 mg/day, Women : 40 mg/day

**Claims of Supplements:** - Vitamin C may help to increase oxygen uptake and aerobic energy production; exercise causes an increased loss so extra may be needed ; intense exercise tends to cause greater free radical damage , so sportspeople need higher doses

**The Science:-** A deficiency reduces physical performance ; exercise may increase requirements to approximately 80 mg/day – these can be met by including 5 portions of fresh fruit and vegetables in the diet each day ; intakes o 100-150 mg may help prevent heart disease and cancer

**Possible Dangers of High Doses:-** Excess is excreted, so toxic symptoms are unlikely; high doses may lead to diarrhea and increase the risk of kidney stones in people who are prone to them

## **9. Vitamin D**

**Functions:-** Controls absorption of calcium from the intestine and helps to regulate calcium metabolisms; prevents rickets in children and osteomalacia in adults; helps to regulate bone formation

**Where Found:-** Sunlight (UV light striking the skin ), fish oils and oily fish , eggs , vitamin-D fortified cereals , margarines and some yoghurts

**Rni :-** No RNI in the UK

**The Science:-** Not so far shown to be beneficial to performance

**Possible Dangers of High Doses:-** Fat – soluble and can be stored in the body; toxicity is rare but symptoms may include high blood pressure, nausea, an irregular heart beat and thirst

## **10. Vitamin E**

**Functions:** - As an antioxidant, it protects tissues against free radical damage; promotes normal growth and normal growth and development; helps in normal red blood cell formation

**Where Found:** - Pure vegetables oils, wheat germ, whole meal bread and cereals, egg yolk, nuts, sunflower seeds, avocado

**Rni :-** No RNI in the UK; suggested intake 50-80 mg/day

**Claims of Supplement:** - Since it is an antioxidant, it may improve oxygen utilization in the muscle cell; it may also help to protect the cell from the damaging effects of intense exercise; may help to protect against heart disease and cancer

**The Science:** - Supplements may have a beneficial effect on performance at high altitudes, and may help reduce heart diseases, cancer risk, and post exercise muscle soreness; requirements are related to intake of polyunsaturated fatty Acids

**Possible Dangers of High Doses:** - Although it cannot be exerted, toxicity is extremely rare

## **Mineral**

### **1. Calcium**

**Function(S):-** Important for bone and teeth structure; helps with blood clotting; acts to transmit nerve impulses; helps with muscle contraction

**Where Found:** - Milk cheese, yoghurt, soft bones of small fish, seafood green leafy vegetable, fortified white flour and bread, pulse

**Rni :-** Men: 1,000mg/day women: 700mg/day

**Claim(S) of Supplement:** - May help to prevent calcium deficiency and, in some cases osteoporosis (brittle bone disease)

**The Science :-** There is no evidence that extra calcium prevents osteoporosis; exercise (with adequate calcium intake) prevents bone loss, so supplements would seem to be unnecessary; sportspeople who eat few or no dairy products may find calcium supplements useful for meeting basic dietary requirements; extra calcium may help to reduce the risk of stress fractures in sportswomen with menstrual irregularities

**Possible Dangers of High Doses:** - The balance of calcium in the bones and blood is finely controlled by hormones-calcium toxicity is thus virtually unknown

### **2. Sodium**

**Function(S) :-** Help to control body fluid balance; involved in muscle and nerve function

**Where Found:** - Table salt, tinned vegetables, fish, meat ready-made sauces and condiments, processed meats, bread cheese

**Rni :-** Men: 1.6 g/day (= 4 g salt) woman: 1.6 g/day (=4gsalt)

**Claim (S) Of Supplements :-** It has been claimed that extra salt is needed if you sweat a lot or exercise in hot, humid condition; advocating for treating cramp

**The Science :-** Excessive sweating during exercise may cause a marked loss of sodium, but as salts present in most foods, supplement are us necessary; extra salt is more likely to cause , rather than prevent , camp – dehydration is normally the cause of cramp ( together possibly with a shortage of potassium)

**Possible Dangers Of High Doses :-** High salt intakes may increase blood pressure, risk of stroke, fluid retention and upset the electrolyte balance of the body

### **3. Potassium**

**Function (S) :-** Works with sodium to control fluid balance and muscle and nerve functions  
WHERE FOUND Vegetables, fruit and fruit juices, unprocessed cereals

**Rni :-** Men: 3.5 g/day, Women: 3.5 g/day

**Claim (S) of Supplements: -** May help to reduce blood pressure and encourage sodium excretion

**The Science: -** Extra potassium is not known to cane performance ; may help to prevent cramp

**Possible Dangers Of High Doses: -** Excess is excreted , therefore toxicity very rare

### **4. Iron**

**Function (S) :-** Involved in red blood cell formation and oxygen transport and utilization

**Where Found :-** Red meat , liver , offal , fort field breakfast cereals, shellfish , wholegrain bread , pasta and cereals , pulses , green leafy vegetables

**Rni :-** Men: 8.7 mg/day, Women: 14.8 mg/day

**Claim (S) of Supplements: -** Extra iron can improve the oxygen –carrying capacity of red blood cells, and therefore improve aerobic performance; can prevent or treat anemia

**The Science: -** Iron –deficiency anemia can impair performance, especially in aerobic activity exercise destroys red blood cells and hemoglobin an increases loss of iron, therefore iron requirements of sports people may be slightly higher than that of sedgthly people ; iron is lost through menstruation ,so supplements may be sensible for spots women

**Possible Dangers of High Doses: -** High doses may cause constipation and stomach discomfort; they may also interact with zinc, reducing its absorption



## **5. Zinc**

**Functions:-** A component of many enzymes involved in the metabolism of proteins, carbohydrates and fats help to heal wound ;assists the immune system ;needs for building cell

**Where Found:** - Meat, eggs, wholegrain cereals, vegetables, milk and dairy product

**Rni :-** Men: 9.5 mg/day women:7 mg/day

**Claim(S) of Supplement:** - Suggest a possible role in high-intensity and strength exercise; may help to boost the immune system

**The Science:** - Studies have failed to show that extra zinc is of any benefit to performance; sportspeople with zinc deficiency may have an adequate intake is important

**Possible Dangers of High Doses:** - High doses may cause nausea and vomiting; they also interfere with the absorption of iron and other minerals

## **6. Magnesium**

**Function:** - Cereals, vegetables, fruits, potatoes, milk

**Rni :-** Men: 300mg/day women: 270mg/day

**Claim(S) of Supplements:** - Magnesium status may be related to aerobic capacity

**The Science:** - Studies have failed to show that magnesium supplements are beneficial to performance

**Possible Dangers of High Doses:-** No evidence that high intake are harmful

## **7. Phosphorus**

**Function(S):-** Assisi bone and teeth formation; involved in energy metabolism as a component of ATP

**Where Found :-** Cereals, meat, fish, milk and dairy products, green vegetables

**Rni :-** Men; 540 mg/day, Women: 540 mg/day

**Claim (S) of Supplements:** - It has been claimed that phosphate loading enhances aerobic performance and delays fatigue

**The Science:-** The consensus is that phosphate loading is of little benefit to performance

**Possible Dangers of High Doses:** - High intakes over a long period of time may lower blood calcium levels

## **References**

*The complete Guide to Sports Nutrition – Anita Bean*

*Food Harm Food Heal-Reader Digest*

*You can Heal Your Life-Louise Hay*

*Fit and Fine in Body and Mine –Tanushri Podder*