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## Nutrition and sports performance

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### Abstract

The awareness of nutrition playing an important role in sports performance. Many factors can impact the performance of a sports person during competition which may be related to different domains. The most commonly encountered nutritional related problem among sports person is their failure to consume sufficient total of food energy. Food is composed of six basic substance: *Carbohydrates, Proteins, Fats, Vitamins, Minerals and Water*. Each one of these has specific function in providing nourishment for the body. For the sportsman, it is of critical importance to recognise what each does to his body under the physical, mental and emotional strains of competition. The duration and the intensity of the exercise involved in a given sports will determine the principal source of energy used in meeting the work demands of that particular sports. The certain nutrition and dietary approaches an enhance the sports performance and also nutrition is essential for an athletes good performance. The athlete's diet should be high in carbohydrates, moderate in proteins and low in fat.

**Keywords:** Nutrition, diet, sport, athlete

### Introduction

At the most basic level, nutrition is important for athletes because it provides a source of energy required to perform the activity. The food we eat impacts on our strength, training, performance and recovery. Not only is the type of food important for sports nutrition but the times we eat throughout the day also has an impact on our performance levels and our bodies ability to recover after exercising.

Meals eaten before and after exercise are the most important in sports nutrition but you should really be careful with everything that you put into your body. As a general rule of thumb athletes should eat about two hours before exercising and this meal should be high in carbohydrates, low in fat and low to moderate in protein. Carbohydrates are the main source of energy that powers your exercise regime and protein is required to aid muscle growth and repair. After exercising you need to replace the carbohydrates you have lost and you need to ensure proper muscle recovery by including protein in your post training meal.

Nutrition is a major contributor to an athlete's overall sports performance. The main role of sports nutrition is to "support" the training program. So, eating for performance will change as the training regimen changes. Poor nutrition can lead to injury, fatigue and poor recovery, all three of which can hinder how well an athlete performs. A healthy diet and a performance diet are not that different from one another. Sports nutrition is more than carbohydrates to fuel activity and protein for mending muscles. All of the vitamins and minerals play a role in helping our bodies be the best they can be. Calcium and vitamin D for bone health, adequate iron to prevent fatigue and antioxidants to support the immune system are only a few roles nutrition plays. A board certified specialist in sports dietetics can help athletes build a performance diet tailored to their specific training regimen, age and gender requirements.

### The basic nutrients

Food and beverages are composed of six nutrients that are vital to the human body for producing energy, contributing to the growth and development of tissues, regulating body processes and preventing deficiency and degenerative diseases. The six nutrients are classified as essential nutrients. They are carbohydrates, proteins, fats, vitamins, minerals and water. The body requires these nutrients to function properly however the body is unable to endogenously manufacture them in the quantities needed on a daily basis.

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- **Carbohydrates:** Carbohydrates are stored in the body in a form of glycogen, which can be used during physical activity. Carbohydrate is necessary to meet the demands of energy needed during exercise, to maintain blood glucose level and replenish muscle glycogen store. During sub-maximal exercise, carbohydrates in the body are the major source of fuel.
- **Protein:** Protein is needed for nutrient transfer in the blood, connective tissue support and the repair of tissue in response to periods of exercise.
- **Fats:** Fat is primarily used as a fuel during low to moderate intensity exercise. Fat is also engaged in providing structure to cell membranes, helping in the production of hormones, lining of nerves for proper activity and make it easier for process of absorption of fat soluble vitamins.
- **Vitamin and Minerals:** Vitamins are required in wide variety of bodily functions and operations which helps to sustain the body healthy and disease free. The function of minerals is for structural development of tissues as well as the regulation of bodily process.
- **Water:** The human body can survive for a long duration without any of the micro and macro nutrient but not without water. The body is made of 55-60% water, representing a nearly ubiquitous presence in bodily tissues and fluids. In athletics, water is important for temperature regulation, lubrication of joints and the transport of the nutrients to active tissues. It regulates the body's temperature, cushion and protects vital organs, aids the digestive system, acts within each cell to transport nutrients and dispel waste.

Dehydration can impair athletic performance and, in extreme cases, may lead to collapse and even death. Drinking plenty of fluids before, during and after exercise is very important. Don't wait until you are thirsty. Fluid intake is particularly important for events lasting more than 60 minutes, of high intensity or in warm conditions.

Water is a suitable drink, but sports drinks may be required, especially in endurance events or warm climates. Sports drinks contain some sodium, which helps absorption. A sodium content of 30mmol/L(millimoles per litre) appears suitable in sports nutrition.

Using salt tablets to combat muscle cramps is no longer advised. It is lack of water not sodium that affects the muscle tissue. Persistent muscle cramps might be due to zinc or magnesium deficiencies.

### **Nutrition in sports vs. Health**

Sports nutrition is the study and practice of hydrating and fuelling your body with the aim of improving athletic performance. The ultimate goal is improving performance, realising true potential and when executed properly, a scientific, person-centred nutrition plan can help you do just that. Over the years, sports nutrition has changed and morphed in parallel with the growing awareness of the role that exercise plays in overall health and awareness. Today, with the help of more science and research, nutrition in sport is now rapidly growing, developing ever more new ways to help people run longer, lift more, swim further or do whatever sport they want to do just that bit better.

### **Pre-event meal**

The pre-event meal is an important part of the athlete's pre-exercise preparation. A high-carbohydrate meal three to four

hours before exercise is thought to have a positive effect on performance. A small snack one to two hours before exercise may also benefit performance.

Some people may experience a negative response to eating close to exercise. A meal high in fat or protein is likely to increase the risk of digestive discomfort. It is recommended that meals just before exercise should be high in carbohydrates and known not to cause gastrointestinal upset. Examples of appropriate pre-exercise meals and snacks include cereal and low-fat milk, toast/muffins/crumpets, fruit salad and yoghurt, pasta with tomato-based sauce, a low-fat breakfast or muesli bar, or low-fat creamed rice.

### **Eating during exercise**

During exercise lasting more than 60 minutes, an intake of carbohydrate is required to top up blood glucose levels and delay fatigue. Current recommendations suggest 30-60 g of carbohydrate is sufficient, and can be in the form of lollies, sports gels, low-fat muesli and sports bars or sandwiches with white bread.

It is important to start your intake early in exercise and to consume regular amounts throughout the exercise period. It is also important to consume regular fluid during prolonged exercise to avoid dehydration. Sports drinks, diluted fruit juice and water are suitable choices. For people exercising for more than four hours, up to 90 grams of carbohydrate per hour is recommended.

### **Eating after exercise**

Rapid replacement of glycogen is important following exercise. Carbohydrate foods and fluids should be consumed after exercise, particularly in the first one to two hours after exercise. To top up glycogen stores after exercise, eat carbohydrates with a moderate to high GI in the first half hour or so after exercise. This should be continued until the normal meal pattern resumes.

Suitable choices to start refuelling include sports drinks, juices, cereal and low-fat milk, low-fat flavoured milk, sandwiches, pasta, muffin/crumpets, fruit and yoghurt.

### **Benefits of sports nutrition**

The ideal diet for an athlete is not very different from the diet recommended for any healthy person. And while certain sports require the athlete to fit a certain weight group or body fat, the benefits to nutrition in sports spans beyond just aesthetics.

- Enables you to train longer and harder
- Delays onset of fatigue
- Maintains a healthy immune system
- Enhances performance
- Improves recovery
- Improves body composition
- Reduces potential of injury
- Helps with focus and concentration
- Things to remember
- Good nutrition can enhance sporting performance.

A well-planned, nutritious diet should meet most of an athlete's vitamin and mineral needs, and provide enough protein to promote muscle growth and repair. Foods rich in unrefined carbohydrates, like wholegrain breads and cereals, should form the basis of the diet. Water is a great choice of fluid for athletes to help performance and prevent dehydration.

## Conclusion

Athletes are always looking for an edge to improve their performance, and there are a range of dietary strategies available. Nonetheless, dietary recommendations should be individualized for each athlete and their sport and provided by an appropriately qualified professional to ensure optimal performance. Dietary supplements should be used with caution and as part of an overall nutrition and performance plan. Nutrition plays a very important role in sports performance. Without adequate carbohydrate and fluid, an athlete will get tired very easily and quickly. Protein is needed to rebuild muscles. Without all three of these plus adequate vitamins and minerals, an athlete will never be able to perform to their maximum potential. An athlete needs to pay close attention to when and what he is eating prior to a game or match as well as how much he is drinking.

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