**Sports Nutrition**

The interest in physical fitness is very high in all the age groups of populations around the world.

**Reasons for sport**

* It is an ideal way to use energy, as it helps us to stay in shape and look good.
* It helps to improve posture, build muscle strength and increases flexibility of joints.
* It strengthens the heart (a vital muscle) and improves circulation.
* It relieves tension and helps us to enjoy life.
* It reduces the risk of contracting chronic diseases.
* To participate in athletics and possible competition

Individuals have different body shapes and sizes depending on their age, gender, genetic background, state of health, body types. **Ectomorphs** have a body type that is slender; **mesomorphs** have prominent muscle and bone development while **endomorphs** have round physique with accumulation of fat. Dietary intake and physical inactivity influence how the body type is expressed.

**Sports Nutrition Basics: Macronutrients**

Sports nutrition is the foundation of athletic success. It is a well-designed nutrition plan that allows active adults and athletes to perform at their best. It supplies the right food type, energy, nutrients, and fluids to keep the body well hydrated and functioning at peak levels. Sports nutrition is unique to each person and is planned according to individual goals. A [sports nutrition diet](https://www.verywellfit.com/sports-nutrition-diet-you-can-do-3967930) may vary day to day, depending on specific energy demands. The amount of energy used in exercise varies with —

(*a*) the intensity of the exercise

(*b*) the duration of the exercise

(*c*) the sex, age, weight of the individual

 (*d*) the state of the individual and

(e) the level of training.

In addition, it is affected by the rest taken during the exercise and the environmental conditions, such as temperature.

The energy required for living and physical activity comes from the food we eat and fluid intake. Macronutrients in the following food groups supply the energy essential to optimal body function:

* **Carbohydrates** are either simple or complex, and the most important energy source for the human body. Simple carbohydrates include sugars naturally occurring in foods like fruits, vegetables, and milk. Whole grain bread, potatoes, most vegetables, and oats are examples of healthy complex carbohydrates. One’s digestive system breaks down [carbohydrates](https://www.verywellfit.com/carbohydrates-the-energy-food-3121395) into glucose or blood sugar which feeds energy to cells, tissues, and organs. Athletes may need 3000 to 5000 kcal for most sports. For an active person, the diet needs to provide 55 to 60 per cent of total dietary calories in the form of **complex** carbohydrates as they break down more slowly and help maintain blood sugar levels more evenly. Secondly, starches are more readily converted to glycogen to maintain this reserve store.
* **Proteins** are made up of a chain of amino acids and are essential to every cell of the human body. Protein can either be complete or incomplete. Complete proteins contain all the amino acids needed by the body and include animal sources like meat, fish, poultry and milk. Incomplete protein sources (typically plant-based proteins) often lack one or more of the essential amino acids. Essential amino acids cannot be made by the body and must be supplied by food. [Protein](https://www.verywellfit.com/multiple-benefits-of-protein-3121396) plays an important role in muscle recovery and growth in the active adult or athlete. [Sufficient amounts of protein](https://www.verywellfit.com/how-to-build-muscles-with-sports-nutrition-3120665) per individual help maintain a positive nitrogen balance in the body, which is vital to muscle tissue. Protein requirements can vary significantly ranging from 10 to 15 per cent of the total calories. No additional protein is needed, as it is not meant to serve as an energy source.
* **Fats** can be saturated or unsaturated, and they play a vital role in the human body. Unsaturated fats are considered healthy and come from plant sources like olive oil and nuts. Saturated fats are found in animal products like red meats and high-fat dairy, which are indicated to increase the risk of disease. [Healthy fats](https://www.verywellfit.com/why-eating-fat-keeps-you-healthy-3121407) provide energy, help with body development, protect organs and maintain cell membranes. There is no basis for increasing the level of fat in the diet. The total fat should not exceed 20 to 25 per cent of the total dietary calories. Omega-3 and omega-6 are essential fatty acids that are especially important in sports nutrition diet. Vegetable oils, which are rich sources of such essential fatty acids, should form a part of the total fat intake.

Micronutrients like vitamins and minerals are essential only in the process of energy release as co-enzymes and co-factors. In general, the efficient use of vitamins and minerals by the body is increased due to exercise. Hence exercisedoes not increase the need for vitamins and minerals. The only groups that need to focus special attention in this respect are adolescent and female athletes, who may need iron supplements, if their blood iron levels are very low.

**Preparation for Sports**

1. There is need to increase muscle glycogen stores prior to the competition. This is known as **carbohydrate loading.** The carbohydrate intake (mainly starch from grains) is increased slowly in the week before the event, beginning with 350g and increasing it to 450 to 500g in four days. The day before the event the intake is reduced to normal and complete rest is recommended for the day. Carbohydrate loading is used only by persons engaged in endurance activities such as marathons, long distance running, cycling, walking, and swimming. Children and teenagers should not attempt carbohydrate loading.
2. Adequate hydration and electrolytes are essential for health and athletic performance. The athlete cannot depend on thirst to meet fluid needs. The athlete should drink 400 to 500 ml cool water two hours before the competition, another 400 to 500 ml 15 minutes before the event. He/ she should drink 100 to 150 ml every 20 minutes, depending on the event and climate. He/she should continue to drink fluids after the event until the pre-event weight is restored. Plain cold water is normally the fluid of choice to ensure rehydration, except for endurance competitions or training rounds who needs rehydration with water and [sports drinks containing sodium](https://www.verywellfit.com/hydrating-with-sports-drinks-while-running-2911309) or a dilute salt solution (1/2 teaspoon salt per litre). Lack of sufficient hydration for athletes may lead to the following:
* Hypohydration (dehydration)
* Hypovolemia (decreased plasma/blood volume)
* Hyponatremia (low blood sodium levels/water intoxication)
1. The need for oxygen increases with exercise, as more oxygen is needed to release extra body energy. The ability of the body to provide the oxygen needed is known as **aerobic capacity**. The aerobic capacity is dependent on the fitness of tissues involved in oxygen intake and transport — **lungs, heart and blood vessels** and the body composition.

**Ergogenic Aids**

Winning is the aim of all competitors in sports. Naturally they would like to use any substance

that can aid their activity. These substances are known as **ergogenic** (work producing) aids. Most of these are worthless, except the steroids. The consumption of steroids is dangerous. These steroids are synthetic sex hormones. They have two functions:

(*a*) Tissue growth (anabolic) and

(*b*) Masculinisation (androgenic).

These are used to increase muscle size, strength and performance. Athletes often take these in

mega doses of 10 to 20 times that of normal body production. It is **illegal** to use steroids and those who use these are disqualified from participating in the competition.

The use of steroids is undesirable as it affects the health of the athlete adversely. The undesirable

physiological effects include **stunting normal skeletal development, liver injury, damaging the heart, sterility and many more.** The steroid user undergoes undesirable changes in his/her personalitysuch as being **too aggressive, mood swings from depression to violent rage**.

**Supplements in Sports Nutrition**

Sports supplements and foods are unregulated products marketed to enhance athletic performance. According to the Academy of Sports Medicine, “the ethical use of [sports supplements](https://www.verywellfit.com/bodybuilding-supplements-reviewed-3498780) is a personal choice and remains controversial.” There are [limited supplements](https://www.verywellfit.com/be-informed-about-supplements-3121332) backed by clinical research.

* **Sports food** such as sports drinks, bars, electrolyte supplements, protein supplements, liquid meal supplements
* **Medical supplements:** iron, calcium, vitamin D, multi-vitamin/mineral, omega-3 fatty acids

**Sports Nutrition for Special Populations and Environments**

Sports nutrition covers a wide spectrum of needs for athletes. Certain populations and environments require additional guidelines and information to enhance athletic performance.

* **Vegetarian athlete:** A vegetarian diet contains high intakes of plant proteins, fruits, vegetables, whole grains, and nuts. It can be nutritionally adequate, but insufficient evidence exists on long-term [vegetarianism and athletic performance](https://www.verywellfit.com/nutrition-tips-for-vegetarian-athletes-3120673). Dietary assessments are recommended to avoid deficiencies and to ensure adequate nutrients to support athletic demands.
* **High altitude:** Specialized training and nutrition are required for [athletes training at high altitude](https://www.verywellfit.com/preventing-altitude-illness-and-acute-mountain-sickness-3119092). Increasing red blood cells to carry more oxygen is essential. Iron-rich foods are an important component for this athlete as well. Increased risk of illness is indicated with chronic high altitude exposure. Foods high in antioxidants and protein are essential. Fluid requirements will vary per athlete, and hydration status should be individually monitored.
* **Hot environments:** Athletes competing in hot conditions are at greater risk of heat illness. Heat illness can have adverse health complications. Fluid and electrolyte balance is crucial for these athletes. Hydration strategies are required to maintain peak performance while exercising in the heat.
* **Cold environments:** Primary concerns for [athletes exercising in the cold](https://www.verywellfit.com/how-to-eat-for-cold-weather-exercise-3120675) are adequate hydration and body temperature. Leaner athletes are at higher risk of hypothermia. Modifying caloric and carbohydrate intake are important for this athlete. Appropriate foods and fluids that withstand cold temperatures will promote optimal athletic performance.

**Micronutrient deficiencies**

Micronutrient deficiencies are a concern for active adults and athletes. These include:

* [Iron deficiency](https://www.verywellhealth.com/athletes-and-iron-deficiency-3119352): This can impair muscle function and compromise athletic performance
* Vitamin D deficiency: This can result in decreased bone strength and reduced muscle metabolic function
* Calcium deficiency: This can impair the repair of bone tissue, decrease regulation of muscle contraction, and reduce nerve conduction

**Assignment**

Discuss the eating disorders among the athletes