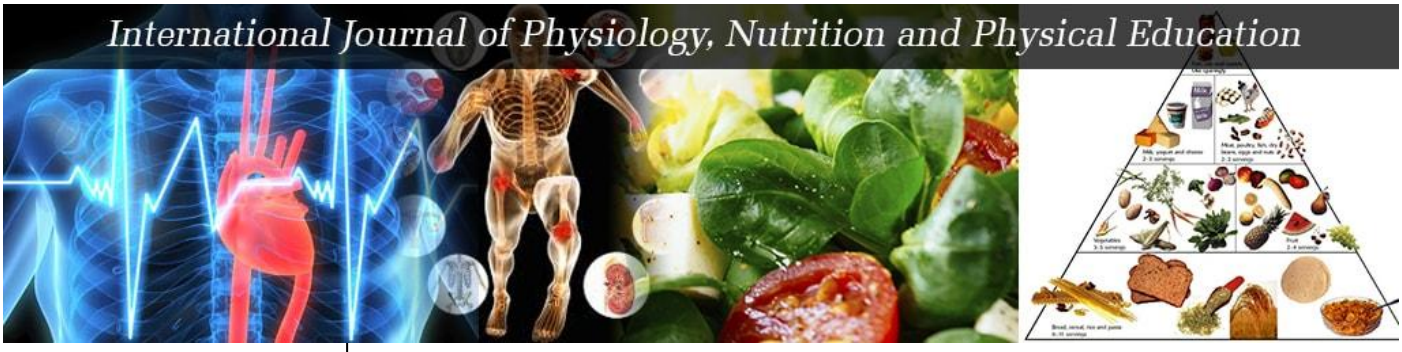


**ISSN:** 2456-0057
IJPNPE 2017; 2(1): 326-328

www.journalofsports.com
Received: 16-05-2017
Accepted: 13-06-2017

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# A good sports performance influenced through nutritional factors

## Dr. Rajwant Singh

**Abstract**
The overall study represent various different factors are involving in good sports performance. *First factor* is the nutritional factors in diet of elite effects the performance, *second factor* is role of motor components to developed sports performance & maintain fitness level of athletes and *third factor* is the various skills that are controlling nutritional factors and motor components. Through present study the researcher focused on nutritional factors that are important for good sports performance. The present study depicted the intake of all different factors should be balanced according to body capacity and requirement, because excess or over loaded activities may be danger for athlete sports performance and for their life. Thus the study shows before adapting any factor for sports performance, the athlete should be knowledgeable or take advice of coach or nutrition expert.

**Keywords:** Elite athletes, sports performance, motor components, nutrition

## Introduction
Many different factors contribute to successful performance in sport. Among these, genetic endowment is undoubtedly the most important, but the innate sporting talent conferred by the genotype can be modified by various factors. Among these, a systematic programme of consistent and intensive training carried out over many years probably plays the greatest role.
Success in sports depends on three factors - genetic endowments, the state of training and nutrition. Genetic make-up cannot be changed. Specialized exercise training is the major means to improve athletic performance and proper nutrition is an important component of the total training program. Athletes and Fitness Enthusiasts need the same essential nutrients that non-active people need with varied increases in their caloric needs as well as some increase in macro and micronutrients. Therefore, it is essential to explore and assess these increased nutritional needs of athletes before, during, and after competition for achieving optimal sports performance.
Nutrition is the study of foods and nutrients and their effect on health, growth, and development of the individual. Sports Nutrition applies nutrition principles to sport with the intent of maximizing performance.
Health related fitness activities generally include cardiovascular training (aerobic activities such as jogging, swimming, cycling, and hiking), flexibility (stretching), strength (heavy resistance training), muscular endurance (extended resistance to a particular muscle), and appropriate body composition (as opposed to a general scale measurement of total weight). For example, one may set a goal to lose body fat (health-related fitness or event specific goal) and to achieve that goal, he or she would create a regular exercise program that includes all of the above components in addition to choosing more nutrient dense foods in the diet that would support increased demand from activities.
Sports-related fitness involves skills that are necessary for sports performance. These skills are sport-specific neuromuscular motor skills such as agility, timing and accuracy, balance, speed, strength, power, and endurance. Specificity of training involves training these components as well as the health components that will be directly needed for one's sport.

## Methodology

### Nutritional Approach

Based on emerging evidence from nutrition science in the last two decades, there have been substantial changes in the approach to nutrition support of elite athletes. Until recently, the primary focus of sports nutrition was on recovery between training sessions to allow the athlete to undertake consistent intensive training without succumbing to injury, illness and chronic fatigue. This led to a particular focus on a high daily carbohydrate intake and high fluid intakes to ensure replacement of sweat losses. More recently, however, there has been a shift towards looking for ways in which sports nutrition can help promote the adaptations that take place in tissues in response to the training stimulus. Athletes still need energy, macronutrients and micronutrients, but sports nutrition is now more about using nutrition strategies to modulate training induced muscle adaptations.

**Table 1:** Specific nutrition strategies that may apply to the elite athlete

| Required Factors | Role of Factors | Other Applicable Factors |
|---|---|---|
| Build and repair muscle | Performance | Sarcopenia/rehabilitation after injury or surgery |
| High-fat diets | Performance | Weight loss |
| Hydration | Performance | Reduced sensation of effort |
| Supplements | Performance | Various |
| Nutrition and the brain | Performance | Promotion of exercise adherence |

## Result and Discussion


**Fig 1:** Percentage of Nutritional Sources

### Advantages and Disadvantages of excess Nutritional factors

### Protein Requirements

Protein requirements and recommendations are based on many years of scientific research. Charts are established from these studies based on bodyweight, sex and age. Athletes do not generally need extra protein unless they are trying to gain muscle mass or they engage in endurance sports. The Recommended Daily Allowance (RDA) for protein for most people is 0.8 grams per kilogram of bodyweight and it is 1.0 to 1.5 grams per kilogram of bodyweight for endurance athletes and bodybuilders. Additional recommendations include increasing plant proteins for the added benefits and keeping the percentage to 10-15% of total calories for any person who is within their appropriate caloric range.

**Table 2:** Calculation of RDA (Recommended Daily Allowance) for Protein

| **Calculating Protein Requirement for a Person Weighing 154 lb.** |
|---|
| RDA for Protein = 0.8 gm of protein / kg of healthy body weight/day |
| Therefore a 70 kg person needs: |
| 70 kg ( 0.8 g protein = 56 g protein/day |

### Disadvantages of Excess Protein Intake

It is difficult **not** to get enough protein if one eats an appropriate amount of calories for his or her bodyweight. There are dangers of overdosing on 2-3 times the recommended amount of protein. Dangers are weight gain if too many calories are eaten, water loss (dehydration) if carbohydrates are not consumed, excess calcium excretion (which can lead to osteoporosis), and possible kidney problems from the burden of its excretion. In addition consumption of high animal protein over and above recommended daily allowance (RDA) (2 (RDA) is associated with the risk of heart disease and colon cancer.

### Carbohydrates Requirements

Carbohydrates are the preferred source of energy for all body functions and muscular exertions and are necessary to assist other foods in digestion, assimilation, and elimination. Carbohydrates differ greatly from one to the other.

Carbohydrates can be classified into simple or complex depending on the length of the saccharide chain. The term “simple” refers to the single or double molecule of a sugar (the monosaccharides and the disaccharides). Examples of

monosaccharides in the diet are glucose, fructose, and galactose. These monosaccharides bond to form the disaccharides. Examples of disaccharides in the diet are sucrose, lactose, and maltose. A glucose molecule and another glucose molecule form maltose. Glucose and a galactose molecule form milk sugar, which is lactose. A glucose and a fructose (fruit sugar) molecule form sucrose (table sugar). Long chains of sugar or glucose units are polysaccharides such as amylose. Fiber is also form of complex carbohydrate.

**Table 3:** Carbohydrate Consumptions

| |
|---|
| It is generally recommended that at least 55% of total calories should be from carbohydrate for an average person (FAO/WHO/UNU, 1985, Technical Series No. 724). Athletes need total carbohydrate grams to be closer to the WHO recommendation in order to properly store enough fuel for their events, especially for endurance competition. A minimal daily amount of carbohydrates recommended for an athlete is 300 grams if the total intake is 2000 k.cal. |

**Disadvantages of Excess Carbohydrate Consumption**

Several problems may occur with the consumption of too many simple refined carbohydrates such as unstable blood sugar levels, diabetes and hypoglycemia, obesity and weight problems, rapid pulse and trembling, headaches, anxiety, and confusion, tooth decay, insomnia, nervousness, and depression, and inadequate nutrient intake by replacing nutritious foods with the "empty" calories, "empty" meaning devoid of any nutrient value.

**Fats**

Fats are essential for good health. They constitute an important source of energy storage in the body, cushion and protect vital organs and carry fat-soluble vitamins like vitamins A, D. E and K. However excess consumption of fats, particularly saturated fats, can be injurious to health.

Fats can be derived from animal sources like meat, eggs, milk and milk products and also from vegetable sources like oils from a variety of seeds e.g. rapeseed, sunflower, etc. or nuts like peanuts.

Fats can be classified into 4 categories viz. saturated fats, monounsaturated fats, polyunsaturated fats and trans fatty acids. The food sources of these types of fatty acids are indicated below:

**Saturated:** Butter, cheese, meat and meat products, full-fat milk, pastries, coconut oil and palm oil

**Monounsaturated:** Olives, rapeseed oil, nuts, avocados, canola

Polyunsaturated (Omega-3) Salmon, mackerel, trout, walnuts, flax seeds

Polyunsaturated (Omega-6) Sunflower seeds, wheat germ, soybean, corn

**Trans fatty acids:** Baking fats like hydrogenated vegetable oils (Vanaspati), fatty meat

| |
|---|
| Moderate consumption of fat and a balance between saturated and unsaturated fats are desirable. For a balanced diet:<br>- reduce total dietary fat to less than 30 per cent of total calories<br>- reduce saturated fats intake to 10 per cent of total calories |

**Conclusion**

The aim of training is to improve exercise performance, and this is achieved by modulation of gene expression to induce changes in the structure and function of skeletal muscle and other tissues. The nature of the adaptation to training is specific to the nature of the stimulus applied: endurance training will enhance the capacity for endurance performance but elite athletes have low muscle strength and highly trained strength athletes generally have poor endurance. The degree of response is proportional to the training load, i.e. to the intensity, duration and frequency of training. These responses to training are induced by selective alterations in the rates of synthesis and degradation of specific proteins: the tissue content of functional proteins is increased and the content of proteins that serve no functional role is decreased. The response is modulated by the nutrient, metabolic and hormonal environment, and this can be modified by food intake before, during and after training. In this context, it is interesting to note that the 2011 list of prohibited substances and methods issued by the World Anti-Doping Agency includes, under Category M3, Gene Doping, the following prohibition:

"The use of agents that directly or indirectly affect functions known to influence performance by altering gene expression"

This clearly suggests that the use of nutrition manipulations that alter gene expression after training, and indeed training itself, are considered to be doping methods. It seems unlikely, however, that any athlete would be penalised for applying these methods.

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