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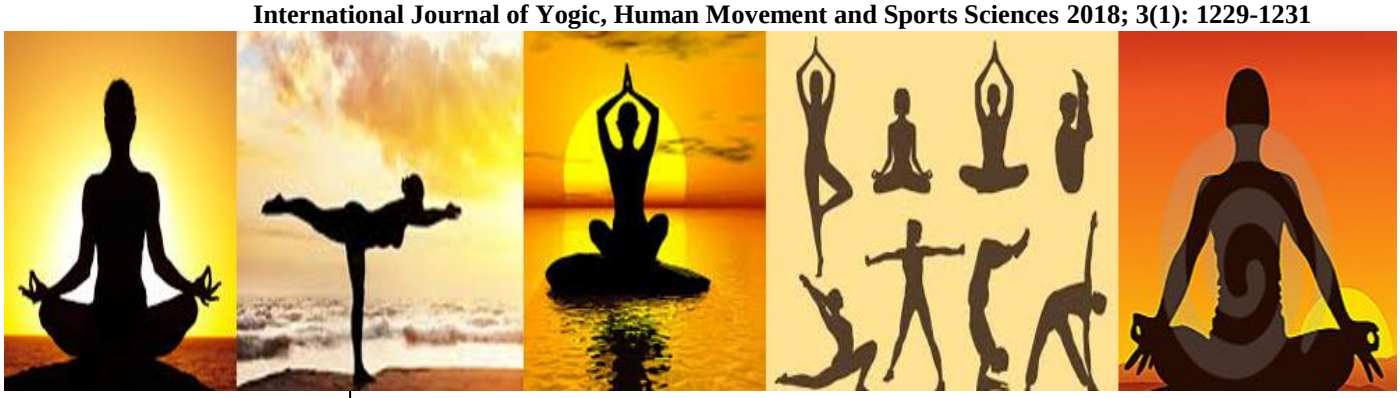

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Nutrition for exercise and sport performance

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Abstract
Great developments in the scientific perceptive of the role of nutrition in health and physical performance has been evidenced over a period of two decades. Enough evidence based physiological and epidemiological studies showing that there exists an increased risk of developing disorders such as high blood pressure, coronary artery disease and some cancers as a result of certain dietary behavior which has led to dietary recommendations that are intended to reduce the incidence of these disorders in the community. In relation to sports performance, the science of nutrition has grew from empirical studies investigating the effects of dietary manipulations, such as restriction and supplementation, to the direct investigation of the physiological basis of the specific nutritional demands of hard physical exercise. As a result of athletic exercise, the athlete experiences stress that stimulate specific biochemical parameters. Training is the predominant demand in the athletic lifestyle. An optimal sports diet is necessary which helps them to provide a better performance. Appropriate nutritional foods are required for athletes to meet their individual energy requirements in competition, training and recovery. If these nutritional needs are not met, there is an increased risk of poor performance and health issues.

Keywords: Nutrition, sport performance, role of nutrition in health and physical

Introduction
Nutrition is the way to study the nature of foods and nutrients and their effect on health, growth, and development on the individual. The Sports Nutrition applies various nutritional principles for the development of sport with the solid intent of maximizing performance. The three main factors that improves the sports performance are Genetic endowments state, the training state and nutrition state. Genetic make-up state cannot be changed. Specialized exercise training and proper nutrition are the important components of the total training programme for improving athletic performance. The essential nutrients of the athletes are more or less the same when compared to that of the non-athlete except the higher calorific requirements derived from macro and micronutrients. Thereby, it is essential to explore and evaluate these enhanced nutritional needs of athletes before, during, and after competition for achieving optimal sports performance. The simple method adopted for assessing the athlete's nutritional status is ABCDE method usually followed in population studies. Anthropometrics measurement includes weight and height of a person. Biochemical analysis comprises of blood and urine tests. Clinical assessment includes recognizing signs and symptoms of deficiencies or excesses. Diet history is a method of tracking the history of a person on his eating habit over a period of time. Economic status is a factor that decides when assessing one's nutritional intake.

Nutrient and Its level of consumption
Energy Requirement
Good nutrition supports a hand in training an athlete intensely, and also in muscle recovery and metabolic adaptations towards endurance exercises. Required energy should derive from a wide variety of foods available that provide rich carbohydrates, proteins, fat and micronutrients (Potgieter, 2013) [6]. In order to maintain the energy level of an individual, the balanced diet should be sound with physical activity. On the other hand, it might be demanding to meet the energy requirements of athletes with the structure and functional development and body weight and height (Kreider, *et al*., 2010).

It is universally accepted that, during peak performance the tempo of energy metabolism raise as much as 20 fold from basal level. However, this much of energy may not use the athlete for longer version as It is usually implicit that a regular sports person desires 70% of capacity for significant periods of time and more than 80% of his maximal capacity for short periods which is also crucial for maintaining homeostasis and lactic acid tolerance in the blood.

Besides this, the most important measure of performance is the ability of intake level of VO2 max. Therefore all these factors (physical, physiological, sport specificity etc.,) is essential in recommending dietary allowances not only in improving the ultimate performance of the individual athlete, but also to achieve desirable body size, shape and composition suitable to the event. The post event nutritional dietary needs of the athletes should be taken into consideration for replenishing the glycogen storage level and for the repair and regeneration of the tissues. Thus, meeting the required needs of athletes with regard to energy, proteins, fats, minerals and vitamins which are very crucial in recovery and competition. These nutrients perform a major role in the metabolic processes on the body. The performance of the athlete will be low by deficit of any nutrient level. So according to the athlete's performance it is very important to uphold, appropriate level of diets actually consumed by the players and that access their physiological parameters and body composition which would help for setting up and fighting malnutrition troubles by modifying their diets time-to- time to attain most favorable performance.

Carbohydrate Requirements

On a daily routine basis intake of carbohydrate is essential for physically active individuals, and should be timely loaded according to training sessions in order to ensure optimal pre-workout nutrition, as well as to encourage recovery post workout. During the day, carbohydrate intake is not possible; the intake should be loaded according to individual fondness and forbearance, that the total daily requirements are met. The athlete nutrition level should be obtained from calculating carbohydrate requirements as a percentage of the total energy requirement instead of focusing on determining the requirements expressed as grams per kilogram (g/kg) body weight (BW). The total energy requirement will be met out when there is intake of sufficient amount of macronutrients. The g/kg body weight constraint ensures that adequate macronutrients are provided with respect of total energy intake and that there is some flexibility when it is necessary to individualize nutrition plans according to specific training regimes (Burke, *et al*., 2011) [1]. In proportion to their body weight (kg) and training schedule the athletes require more energy than compare with sedentary individuals.

The carbohydrate need varies before exercise based on the age height weight and types of exercises and training. During moderate- to high-intensity Training the limited glycogen stores in the body resolve only last for almost 90 minutes to three hours. Carbohydrate loading is a strategy that involves changes to nutrition and training which can exploit muscle glycogen stores prior to competition and endurance exercise lasting longer than 90 minutes. This policy lifts up muscle glycogen which stores and increase endurance and exercise performance. This is also essential in maintaining muscle tissue stores which can be decreased with low glycogen levels (Kerksick, *et al*., 2008) [2]. During and after the aerobic event, the carbohydrate-loading regime is complemented with the consumption of sufficient carbohydrates. Similarly, the essential requirement of carbohydrate varies based on the duration of the exercises. For the aerobic activities that take long duration such as long distance endurance events results in low muscle glycogen stores, the common complaints include muscle cramps, fatigue and hypoglycemia Therefore, planned carbohydrate loading is essential in achievement of peak performance, increase in liver and muscle glycogen stores, as well as optimal fluid intake is needed. Low levels of energy, fatigue or "hitting the wall", loss of concentration, heavy legs, dizziness, a slow rate of recovery, fainting and irritability are the signs of suboptimal carbohydrate intake. Carbohydrates ingestion is recommended during exercises based on its type, amount and timing of exercise and should be tailored based on the individual preference (Potgieter, 2013) [6].

Carbohydrate loading is mainly responsible for increasing glycogen storing capacity in the muscles and the liver, available evidence indicates that ideal levels of carbohydrate intake optimize muscle glycogen resynthesis. Between events or training sessions, when there is less than eight hours of recovery time, speedy refueling is mainly important (Burke, *et al*., 2011) [1].

Protein Requirements

Physical activity such as strength, speed and endurance training will be elevated and enhanced by the adequate intake of dietary protein. Energy intake, exercise intensity and duration, ambient temperature, gender and age influences protein requirements. (Kreider, *et al*., 2010 & Phillips, *et al*., 2011) [4]. In the case of strength or resistance training the protein requirement would be increased because, it supports muscle protein synthesis, reduces muscle protein breakdown and repairs muscle damage. Lucien oxidation increased by endurance exercise. Therefore, according to their sedentary counterparts endurance athletes may require slightly higher protein. According to the DRIs, the general protein requirement for a sedentary person is 0.8 g/kg BW/day. By the way, this requirement suffices for general fitness and can be somewhat elevated to 1.0 g/kg body weight/day (Phillips, *et al*., 2011) [4].

The recent literature as per ISSN states that the addition of protein to carbohydrates (carbohydrates to protein ratio of 3-4:1) for the duration of exercise enhances the performance and It has confirmed in terms of reducing muscle damage, improving endurance performance, increasing muscle glycogen stores and promoting better training adaptations after resistance training. The ISSN also states that depending on the duration of the exercise and fitness level of person to person, protein should be incorporated with carbohydrates in the pre-event meal before resistance exercise or when a desired change in body composition is required (Kerksick, *et al*., 2008) [2]. The ACSM recommends that after exercise the most important goals of revival should be to provide electrolytes, sufficient fluid, energy and carbohydrates to replace muscle glycogen stores and facilitate recovery (Rodriquez, *et al*., 2009).

Fat Requirements

The essential fat requirements for athletes and non- athletes are almost same. To consume adequate amounts of fat is a need to ensure optimal health, maintenance of energy and balance. Optimal intake of essential fatty acids and fat-soluble vitamins plays a vital to replenish intramuscular triglycerol stores. Loading of fat should be done based on the type of the training status and goals of the athletes consider the amount of

fat requirement (Kreider, *et al*., 2010 & Rodriquez, *et al*., 2009). It is suggested that athletes should be cautious of high-fat diets (>30% of total energy intake).A high intake of fat can be at the expense of carbohydrate intake and that may bring negative effects on training and performance (Potgieter, 2013) [6].

Fluid Requirements

Body weight of athletes is lost through sweat. Athletes should not only rely on thirst as an accurate indicator of fluid needs. To determine sweat loss body weight should be measured before and after exercise sessions. In order to maintain fluid balance and prevent hypo hydration, fluid should be ingested at a rate of 0.5-2 l/hour and there should be frequent (every 5-20 minutes). Ingestion of small amounts of fluid (150-200 ml). In the hot and humid environments for athletes may keep the body away from dehydration. Recommended fluid intake should be increased. To reduce body weight, excessive techniques (use of diuretics, vomiting and saunas) are unsuitable and hazardous to human health (Kreider, *et al*., 2010).

Micronutrient Requirements

Vitamins and minerals are essential nutrients in terms of given that a health benefit, although the ergogenic effect of most micronutrients is still imprecise and warrants further research (Potgieter, 2013) [6].

For attaining excellence health and peak performance, it is essential to focus on the task of how an active person or athlete would go about learning what and how much to eat. First, learn body's nutrient needs; secondly categorize those needs and gain knowledge of the foods to meet those needs; third, learn how to think critically about food selection, examine labels, and assess foods. With these scientific contributions the athlete is prepared to generate a systemic food plan. The athletes participating in international events should be aware of the availability of food and how the selection has to be made. This information is essential because unexpected change in food can affect performance. The athletes must get used to the food that will be served to them at least three days before the event. In this way, the athletes must to be well-informed. About 45 essential nutrients must be obtained either from the diet or supplements. Those nutrients comprise glucose, 2essential fatty acids, 9 essential amino acids, 13vitamins, about 21 minerals, and water. They can be simply classified as carbohydrates, fats (lipids), protein, vitamins, minerals, and water. All of the above are essential for every cell in the body and for human life to exist.

Conclusion

With regard to sport nutrition, there is no single consensus document that provides all the necessary guidelines and recommendations needing for consultation with an athlete. Therefore, a combination of these and other guidelines should be used to individualize the nutritional management of athletes. Apart from the above mentioned guidelines and recommendations, nutritional strategies of sport-specific should also be implemented in training programs to aid in exercise, sports performance and recovery. A balanced diet should provide ample amounts of energy, carbohydrates and protein to ensure sustained exercise performance and optimal nutrition to support exercise performance.

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