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Evaluation of Diet and Nutrition Supplements for Enhancement of Athletes Performance

Amit Das

Research Scholar, Department of Physical Education, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P.

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ABSTRACT

Experimental data suggests that clinical nutritional deficiencies are rare when consumed a balanced diet where distinguished factors are responsible to achieve athlete success. The importance of advisory service related to diet and nutritional supplements are increasing day by day. An unethical supplement with banned substances may increase the risk of positive doping result. The rationale of this study involves to deliver the proper information related to diet and nutritional supplements which reveals performance of athletes with special reference of prevention of nutritional deficiencies and safety issues.

1. Introduction

Sports nutrition is the branch of nutrition which includes the daily food consumption plan of athlete based on their physical practice for promoting their overall health. Recent research established that athletes' performance depends upon various factors such as proper training, psychology, environmental factors, proper dietary nutrition supplements, food choice, body weight and composition etc. [1-3]. Proper balance of nutrition may enhance the best performance of sports. Deficiencies of diet and nutrition may be occurred the limitation of the work capacity. So, it is essential to practice of healthy habits related to nutritional and dietary values [4]. However, less or more intake than recommendations may cause severe health effects.

The essential basic nutrients include carbohydrates, proteins, fats, vitamins and minerals, water. Sodium bicarbonate may also improve exercise performance and also long-term muscular endurance activity.

2. Micronutrients:

Micronutrients may be vitamins and minerals and these are metabolized under normal physiological conditions. These are well versed as a balanced diet with proper calories. Athletes may benefit through beans, green vegetables, red meat, iron rich foods like peanuts, dried fruits, carbohydrates, proteins, fats, fluids etc. [5].

Table 1: Supplemental nutrition recommendations for athletes (after exercise):

Types	Recommendations
Proteins	20 gm
Carbohydrates	1gm-1.5gm/kg of body mass within 30 mins of exercise
Fluids	450–675 mL/0.5 kg
Micronutrients	Associated with sweat loss

3. Proteins:

Proteins are required for health maintenance, prevention of weight loss and normal cellular body tissues functioning. Food sources includes egg whites and dairy sources containing multiple amino acids, protein-rich foods should be recommended. Studies suggested that protein supplements are essential to build athletes' muscle and enhancement of high performance through hypertrophy, strength and power, speed [6].

4. Fats:

To promote long term health, dietary lipids are important for the absorption of the vitamins like A,D,E,K and also responsible for cholesterol synthesis as well as other sex hormones. Fats develops the cell membrane structure, hormone production, enhancement of nerves lining, absorption of fat-soluble vitamins [7].

5. Carbohydrates:

Carbohydrates are necessary for body exercise and maintenance of blood glucose level. General carbohydrate required for adult athletes consume 5–12 grams of carbohydrate per kilogram/day whereas the young athletes consume 3-8 grams of carbohydrate per kilogram/day based on exercise/activity, activity intensity, sex, and environmental conditions. Carbohydrates considered as the major part of fuel in the body system [8,9].

6. Vitamins and Minerals:

Vitamins are the group of organic compounds which are essential for nutrition and also used small quantities in diet as the body system not synthesized them. The function of minerals is for structural development of tissues within the body.

Water soluble vitamins includes vitamin B and vitamin C (ascorbic acid). The vitamin B includes thiamin (B1), riboflavin (B2), niacin, pyridoxine, cyanocobalamin (B12), folic acid and they have different important functions like metabolism of carbohydrate and amino acids, electron transport system and oxidative metabolism, gluconeogenesis, hemoglobin formation etc. The function of the vitamin C (ascorbic acid) is antioxidant. The fat-soluble vitamins include Vitamin A, D, E, K. Retinol (vitamin A) and tocopherol (vitamin E) are used as antioxidant whereas vitamin D & K have been used for bone formation.

Minerals are also known as nutrients which includes magnesium, iron, zinc, copper, chromium. The functions include metabolism of energy, nerve conduction, muscle contraction, synthesis of hemoglobin and nucleic acid,

metabolism of glucose etc. which may help for development of athlete performance [10].

7. Water:

In athletics, water is too much important due to joints lubrications, maintenance of temperature, nutrients transportation, helps digestive system, protects vital systems through nutrient transport and regulation for body waste disposal. Water also required for excessive sweating, dehydration, physiological imbalance, heart injury, illness etc.

8. Conclusion:

Athletes eats several times for their energy requirements. They may be taken nutritional recommendations through dietitians, nutritionists, medical practitioners, sports scientists, coaches, trainers and the secondary source includes nutrition education programs, sporting magazines, the media and internet. For muscle protein synthesis (MPS), dose response studies suggested that the high-quality protein is best for MPS at rest [11]. Fluids and electrolyte balance also required for athletes due to achieving normal hydration practices [12,13]. The following practices may be suggested for athletics due to prevention of nutrient deficiencies:

- The athletics should be careful about the quality and quantity of diet and food supplements.
- The athletics should be aware about toxicity, safety issues, negative nutrient interactions, side effects, adverse effects etc.
- Requirement of nutritional evaluation on the basis of physical activity.

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