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Analysis on the diet of basketball athletes

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Abstract. Food is essential for human survival. Dietary nutrients contribute significantly to our health. As a typical group that engage in a great deal of physical activity, athletes require a diet rich in the right kinds of nutrients in order to keep their bodies running at peak efficiency. Basketball is an intensely competitive sport. To achieve victory, both teams will engage in physical and technical confrontation. Contemporary basketball is distinguished by its intense rivalry. As basketball evolves and strives to reach a higher level, the physical requirements for athletes become increasingly stringent. Diet and nutrition are the foundation for athletes. A nutritious diet is a formula for success. Athletes should consume the appropriate amount of energy required by the body. This paper examines the physiological characteristics and nutritional requirements of athletes through a literature review. In-depth research will be conducted to determine the nutritional requirements of basketball players and make dietary recommendations. The purpose of this study is to make dietary recommendations for basketball players by analysing their fundamental signs and nutritional requirements.

Keywords: physiological characteristics, nutritional needs, basketball players, daily recipe.

1. Introduction

The Olympic Games centre on basketball, a physically hostile hand-centered activity. On December 21, 1891 [1], basketball was conceived by James Naismith, a physical education teacher at the YMCA training School in Springfield, Massachusetts. There will be four 10-minute quarters, and if the score is tied after the fourth, there will be one or more 5-minute halves to determine the winner.

Basketball is a very intense anaerobic activity that requires a lot of work from the lower body. Basketball players need agility, flexibility, and muscular endurance to be competitive on the court. Improving their efficiency requires monitoring and caring for their health. Proper nutrition is just as important as getting the right kind of training. A well-balanced diet can aid in the prevention of sports injuries, the speedy restoration of energy after strenuous exercise, the maintenance of peak athletic performance, the gradual overcoming of sports fatigue, and the successful resolution of the specific medical issues that arise during sports training.

Nikic et al. examined the physical make-up of 64 professional basketball players on the Greek national team [2]. Bioelectrical impedance was used to calculate the body fat and lean mass percentages of athletes across three age groups. Two-way analysis of variance was used to find out how age and position on the team affected body fat percentage, fat-free mass, and body mass index. Concurrently, Tsoufi et al. examined the nutritional intake and quality of a professional basketball team that received

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daily nutrition counselling during practise and game days and competed in a European level [3]. A 24-hour food diary was used to record daily dietary consumption, and from those data, a Healthy Eating index (HEI) was derived. The study found that professional basketball players had access to trained sports nutritionists on a daily basis, ate well most of the time, and ate as healthily as possible on game days. Maria used the general self-efficacy of 48 Polish basketball players to quantitatively measure their diet [4]. It is shown that the intake of particular nutrients has a direct bearing on the confidence levels of basketball players.

The first section of this study will focus on the physiological traits of athletes and the methods utilised to determine their physical parameters. Athletes have specific dietary needs that are determined by their workout routine and metabolic rate, and these needs are laid out in great detail here. Finally, the study offers advice on what kind of diet basketball players should follow before, during, and after games. This study provides a synopsis and framework for the existing literature. The physical traits of basketball players and their nutritional needs are outlined. As a result, readers will have a firm grasp on where the field now stands, be better equipped to spot relationships and contradictions in the literature, and have access to resources for conducting their own study into sports nutrition.

2. The physical characteristics of athletes and monitoring methods

During exercise, athletes experience a state of elevated stress, a sudden increase in energy consumption, a vigorous metabolism, and an increase in myocardial vascular capacity. These will result in strong muscle contraction, accumulation of metabolic byproducts, alterations to the internal environment of the body, decreased blood flow resistance, and increased sympathetic excitability. As an aerobic competitive sport, basketball will burn fat first. In addition to oxygen, it requires the participation of major muscle groups throughout the body, and the movement is lengthy and rhythmic. Therefore, basketball players must have a robust heart and a high pulse output in order to efficiently transport oxygen throughout the body.

In addition to comprehending the physiological characteristics of athletes, it is essential to monitor their physiological and physical parameters. In a review of the relevant literature, it is suggested that basketball players' heart rates be measured so that parameter variations during training can be analyzed. It involves monitoring exercise intensity, assessing player fatigue, and quantifying internal training burden. Finally, a personalized model -- SHRZ model -- is discovered by combining the players' responses during training with the parameters. It requires less time than other models and provides a useful balance of expertise, resources, and implementation [5].

3. Nutritional needs of athletes

3.1. Protein and lipids

Athletes' energy metabolism is affected by their individuality, level of fitness, and the length, intensity, and duration of their workouts. Athletes have specific dietary needs in order to keep their bodies in peak physical condition for training and competition. The breakdown of the body's three primary energy stores provides this fuel. The cost might be quite different from one form of physical activity to another. Sugar catabolism, followed by fat catabolism and protein catabolism, was the primary source of energy for all sports combined [6].

Protein is a crucial component of a healthy diet. Getting enough high-quality protein in your diet is essential. Urinary nitrogen loss and the load on the liver and kidneys both rise when protein intake is high. Proteins are essential for the maintenance and restoration of many different types of tissue. There is a connection between protein and the activation of muscles and the neurological system. It has been shown through scientific research that an athlete's urine nitrogen excretion will increase dramatically with an increase in activity intensity if protein is the sole nitrogen-containing food in their diet.

Fat is an essential part of a healthy diet since it provides a source of energy and is a cellular component. Among its many uses, it acts as a shock absorber, a source of energy, and a thermal insulator. In the diets of general athletes [7], lipids contribute between 25 and 30 percent of the total energy. Lipids

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provide around half of the energy needed by the body during light and moderate activity. About 80% of the energy needed during prolonged exercise can be supplied by lipids. However, consuming an excessive amount of food reduces the body's ability to take in oxygen. Excessive fat also reduces fitness levels and raises the risk of cardiovascular disease. Athletes' endurance and post-workout recovery will be hindered if the ratio is too low. Basketball is an exhausting and time-consuming activity. Liver infiltration is prevalent because fat is involved in the metabolic process that produces energy. Therefore, basketball players should up their intake of fructose and anti-fatty liver meals like phospholipid while decreasing their intake of real fat. This helps the liver replenish glycogen stores after exercise by decreasing the amount of fatty liver infiltration.

3.2. Carbohydrates

Carbohydrates are also very important for athletes. Athletes rely on it heavily because of its ability to rapidly generate energy. Between 55 and 60 percent of an individual's calorie intake comes mostly from carbs. Basketball players benefit most from consuming carbohydrates before, during, and after practises and games. Also, it's the most important supplementable nutrient. A severe carbohydrate deficit not only has detrimental effects on basketball players' training quality and physical performance, but also disrupts the normal metabolism of other substances. Glycogen, derived from carbs, is the principal fuel source in basketball. Maintaining adequate levels of glycogen in the body helps prevent the breakdown of muscle and fat for energy, postpone the beginning of exhaustion, and protect the speed, stamina, endurance, and response time of athletes. The amount of glycogen in an athlete's body is directly related to his or her capacity for physical exertion.

3.3. Minerals and vitamins

The human body still needs minerals and vitamins, but only very little amounts. Minerals like iron and calcium are crucial for basketball players. Iron aids in the delivery of oxygen to working muscular tissue. Calcium helps maintain strong bones and is required for many bodily functions like muscular contraction and neuron activation. As a result, it's best to limit your intake of iron- and calcium-rich foods like liver, dark leafy greens, egg yolks, and dark fish. Although you lose water, minerals, and vitamins through sweat during the first 30 minutes of activity, you are not required to rehydrate at this point. A water supplement is meant to restore the fluids lost via sweat and keep the body from becoming dehydrated. Low-sugar, low-sodium water with inorganic salts is recommended. Water loss can be substantial during a basketball game because the game is typically played inside without air conditioning. A significant amount of fluid will be lost through sweat even in chilly settings. In order to estimate how much water to drink during training, games, and recovery, athletes can calculate their individual perspiration rates as an alternative to depending on perceived sweat rates or thirst. A professional basketball player's daily needs, expressed in terms of kilogrammes of body weight, are detailed in TAable 1.

Table 1. The daily requirement per kilogram of body weight for a basketball player [8].

Energy 55-60kcal	Carbohydrates 8.5-10g	Protein 1.0-1.2g
Minerals	Potassium	3-4g/d
	Calcium	1000-1500mg/d
	Iron	20-25mg/d
	Zinc	20-25mg/d
Vitamins	Va1	500μg
	Vb1	3-5mg
	Vb2	2-2.5mg
	Vc	140mg
	Ve	30mg

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4. An athlete's diet—A basketball player

Maintaining a healthy, well-rounded diet is crucial. High-carb, high-energy, and high-nutrient-density diets are all options for athletes who want to optimise their performance in their chosen sports.

Basketball players need to be physically active, energetic, and healthy, all of which are supported by eating habits that emphasise health and wellness. Many basketball players have high energy needs because of their height, the intensity of their training, and the fact that some young athletes are still growing and developing. Basketball players treat and recover from a variety of injuries throughout practice, games, and postgame. Thus, there are three unique periods of professional basketball players' diets.

Basketball players need to make sure they're feeling good physically and mentally before training or games. Typically, three to four hours before a basketball game, the players eat dinner. This meal is very important since it provides fuel for the forthcoming race in the form of carbohydrates and fluids. Additionally, eating enough protein before competitions can keep you from getting hungry. Moderately replenish with carbohydrate-rich foods like muesli, milk, fruit, etc., during the marathon. Rehydrating, especially with electrolyte-rich sports drinks, should be a priority for the duration of the race. They help replenish your glycogen and electrolytes. Athletes must need downtime to recover. An athlete's post-workout meal should consist primarily of carbs, with some protein and plenty of water and electrolytes. Restorating muscle glycogen levels will guarantee that glucose will be stored. In order to restore muscle growth and function, protein supplements are needed. As can be seen in Table 2, rehydration serves to replace fluids that were lost throughout the competition.

Table 2. The diet of basketball players [9].

Pre-game meal	Pre-game snack	Recovery food
Wrap or sandwich with chicken and salad	Yoghurt with fruit salad	Chicken, avocado and salad sandwich
Muesli with yoghurt and berries	Banana and a handful of almonds	Salmon with brown rice and steamed vegetables
Soup served with toast	Peanut butter on rice cakes	Dairy-based fruit smoothie
Pasta with tomato-based sauce	Toast with vegemite	Yoghurt + muesli with nuts and seeds
Chicken stir-fry with rice	Fruit smoothie	Burritos with beef, cheese, avocado and salad

5. Conclusion

The overall physical quality of basketball players is rising as the sport gains popularity around the world. The success of the athletes depends on their ability to maintain a healthy nutritional balance. Adequate and acceptable nutrition may not enhance athletes' performance in competition, but it can help them perform at a normal level [10]. Basketball players have unique nutritional requirements in comparison to those in other sports. A reasonable nutritional supplement can not only keep athletes in peak physical and mental condition, but also help them compete for a longer period of time. This study begins with a brief overview of basketball players' physiology, and then proceeds to an analysis of athletes' dietary requirements by integrating these parameters with their training and performance schedules. Basketball players have different dietary needs before, during, and after games. Therefore, various food suggestions are provided for each of the three phases. There are, however, downsides to this content. This paper primarily consists of a review of related works. There hasn't been enough research done on basketball players' diets and body mass indexes. While they have a common bond as basketball players, each player also has their own distinct personality. The universality of the paper's findings and

recommendations is not proven; more research and practice in the field will be required to confirm its applicability to all basketball players.

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