

Retraction

Retracted: Influence of High-Protein Food on Physical Function of Athletes

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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- [1] S. Liu, N. Wen, and H. Su, "Influence of High-Protein Food on Physical Function of Athletes," *Journal of Food Quality*, vol. 2022, Article ID 4447061, 8 pages, 2022.

Research Article

Influence of High-Protein Food on Physical Function of Athletes

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In order to explore how high-protein foods can achieve effects on athletes' bodies, the authors propose a study based on athletes' physical performance. This method recommends key technical problems and solutions through the information represented by the athlete's physical function and discovers how high-protein foods enable research into athletic performance. Research has shown that athletes perform high-intensity sports training for a long time, in a state of high-intensity competition, the body's energy metabolism is strong, and the protein consumption rate is high; protein foods can preserve protein, water, electrolytes, and other nutrients and supplement about 71% of the body's nutrition, and it helps to strengthen muscles, relieve sports fatigue, improve immunity, etc., which is of great significance to athletes.

1. Introduction

For sports athletes, a reasonable food and nutrition combination is very important, for athletes, protein can achieve muscle building effect, relieve exercise fatigue, improve immune function, etc., so the athlete's diet—be sure to ensure adequate protein foods. The essence of protein is an enzyme, an indispensable factor in maintaining potassium-sodium balance in our body, and also a carrier of red blood cells. During our exercise, the metabolism in the blood is accelerated, especially when athletes are under heavy load pressure and under the stress conditions of competition, they will not only consume a lot of energy but also need a lot of protein to maintain the body's needs. Metabolism, to promote the synthesis of hemoglobin, is closely related to the performance of athletes on the field, so protein is extremely important in this case. This paper analyzes the impact of high-protein food on the physical mechanism of sports athletes, aiming to provide a certain reference for sports athletes' food matching. Protein is an important substance that composes-cut cells and tissue structures, the hormones, myosin, enzymes, and other substances involved in human physiological activities are all composed of proteins. Collagen is an important substance that constitutes the scaffold

of the human body, and it is also composed of proteins, in a word, protein is the scaffold and main substance constituting human tissues and organs, and plays an important role in human life activities [1, 2]. The relaxation and contraction of muscles depend on the activity of protein molecules in the muscles, therefore, protein plays an important role in sports. Strictly control the diet, try to achieve a low-salt and low-fat diet, fundamentally limit the intake rate of fat content in the human body, and at the same time eat as many fresh vegetables and fruits as possible to supplement the amino acids, vitamins, and other nutrients that the human body needs every day. By using nutrients to fully restore the elasticity of human blood vessels and ensure blood viscosity, it can increase the body's physique. Proper exercise, especially aerobic exercise, can increase the oxygen content in the human blood, promote the mutual metabolism and excretion of carbon dioxide and oxygen in the human body, and provide abundant blood for various important organs in the human body. By maintaining adequate and high-quality sleep, the human body's growth hormone secretes the most at night, and maintaining high-quality sleep can ensure the body's basal metabolic rate.

Modern basketball is constantly innovating and developing, the competition between international strong teams is

becoming more and more intense, and the requirements for athletes' physical fitness are getting higher and higher [3]. An athlete's physical potential must be maximized in order for it to be capable of conquering opponents. Seek methods and ways to improve the physical fitness of basketball players, and increase the effectiveness of physical energy reserves, it has become a hot issue in basketball research. For basketball players, physical fitness is the basic athletic ability of their body and an important part of their competitive ability. On the one hand, physical fitness is the basis for basketball players to engage in sports, and is the basis for technical and tactical training and improvement of sports performance; On the other hand, good physical fitness is conducive to preventing sports injuries and prolonging sports life [4].

Many athletes need to control their weight. For example, for strength track and field athletes, if they want to achieve good results in sports competitions and improve their competitive level, they must maintain the best ratio of strength to weight. For some sports athletes, who need to lose weight, in order to achieve the goal of reducing fat, it is often necessary to control their diet, during the period of energy restriction, the muscle protein synthesis of athletes will also decrease accordingly, at this time, protein must be supplemented, so it is necessary to calculate the optimal amount of protein supplementation [5]. Protein is essential for the normal physiological functions of the human body, it has a very important role and is an important component of the human scaffold. Sports athletes have a higher demand for protein than ordinary people, so be sure to keep enough protein in meals. For sports athletes, a high-protein diet can increase muscle, relieve exercise-induced fatigue, improve immunity, control weight, and improve muscle strength, therefore, it is necessary to reasonably match the protein in the diet, and to scientifically calculate the amount of protein that needs to be ingested in combination with the specific needs of sports athletes, it should not be too little or too much, and a personalized protein nutritional supplementation program should be developed [6].

At present, not only different definitions of physical fitness be proposed from different perspectives but also the composition of physical fitness can be classified differently from different perspectives. For example, American academics generally believe that physical fitness can be divided into two categories: health-related physical fitness and skill-related physical fitness, the former includes cardiorespiratory endurance, muscle strength, muscle endurance, flexibility and flexibility, sex, body composition, etc.; The latter includes the speed, explosiveness, agility, balance, coordination, and reaction time required to improve motor skills [7], as shown in Figure 1.

2. Literature Review

Primo et al., in terms of the definition and classification of physical fitness in China: Engels pointed out that every idea that science puts forward contains a revolution in its terminology [8]. Ferhatoglu and others said that the concept of

science is a high-level generalization and summary of a certain thing or phenomenon [9]. And things are always developing and changing, people's understanding of things is gradually from the shallower to the deeper. Therefore, the concept itself also keeps pace with the times and develops with the development of things. The development of the definition of physical fitness reflects the development of training ideas. Therefore, with the deepening of people's understanding of it, the concept of physical fitness has been continuously expanded and given new connotations.

Dong and others said that the description of physical fitness in "sports training vocabulary" is "physical fitness refers to the basic athletic ability of athletes", according to the functional and structural characteristics of various organs and systems of athletes' bodies, physical fitness is divided into "body shape," "physical function," "health level," and "athletic quality." This classification method intuitively expresses the importance of coordination, strength, endurance, agility, speed, flexibility, and other qualities in physical fitness [10]. Similarly, Sabihi et al. also believed that physical fitness refers to the athletic ability of an athlete's body, which is an important part of competitive ability and a synthesis of various physical athletic abilities necessary for athletes to improve their technical and tactical levels and create excellent results [11]. These abilities include body shape, physical function, and athletic quality, of which athletic quality is the most important determinant of physical fitness, body shape and function are the foundation of good sports quality.

Singh Amamcharla thinks that physical fitness refers to the athlete's special training and competition load, maximizing the mobilization of all organ systems of the organism, overcoming fatigue, and completing the functional ability of special physical fitness and competition with high quality [12]. It is also proposed that basketball is not only a skill-based project but also a speed-strength, confrontational physical-skill-based project with high physical fitness requirements. Anyakudo Adeniji also believed that "physical fitness" refers to the performance of athletes under special training and competition loads, the ability to combat fatigue while maximizing an athlete's organic functional capacity [13]. To a certain extent, this ability is specific endurance, or it can also be called the ability to continue to engage in specific work. But this view has obvious shortcomings, equating physical fitness with the ability to fight fatigue and endurance qualities.

Freitas-Júnior defines physical fitness as follows: physical fitness refers to the potential ability of the human body in terms of morphological structure, function and regulation, and storage and transfer of material energy obtained through congenital inheritance and acquired training, as well as the comprehensive exercise ability shown in combination with the external environment [14]. Its size is determined by the body's morphological structure, the functional level of system organs, energy and material reserves, and basal metabolic level. Yerzhanova et al. said that in a narrow sense, an athlete's physical fitness level is mainly expressed through athletic qualities [15]. Sports quality is the

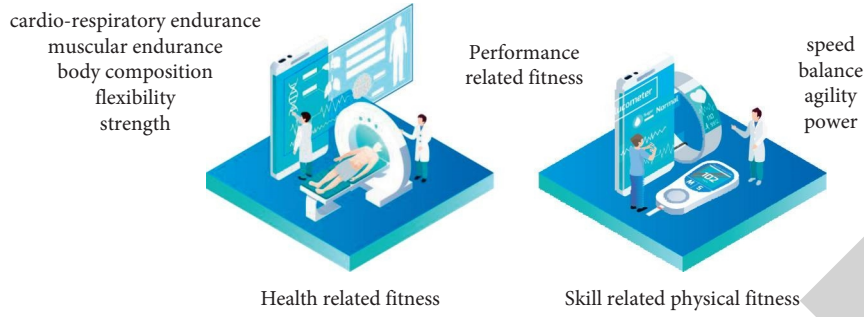


FIGURE 1: The main components of physical fitness.

main external manifestation of physical fitness, which is manifested in various sports abilities such as strength, speed, endurance, flexibility, and agility during exercise. And believes that the main means of developing and improving physical fitness is through sports training. This definition is based on summarizing the results of many people and is, therefore, more comprehensive.

Since human beings entered the twenty-first century, molecular genetics research on physical fitness has advanced by leaps and bounds, the relationship between genes and physical fitness has become hot research in recent years and the research on human genetics has confirmed the heritability of physical fitness. More than 70 loci related to physical fitness have been reported, with proof such as β -adrenergic receptor and α -adrenergic receptor are related to VO2MAX, ciliary neurotrophic factor (CNTF) and muscle strength, haptoglobin gene, and lactate threshold. Research on genes and physical fitness provides a scientific basis for early detection and selection of sports talents and also plays a role in promoting physical fitness research and athlete health.

3. Methods

3.1. Potential Well Model Based on Protein Potential Energy. The key of the algorithm to solve the optimization problem is to maintain the balance of divergence and convergence to better overcome falling into the local optimum, and at the same time maintain a faster convergence speed [16]. Usually, the particle swarm algorithm has a faster convergence speed in the early stage and a large search range, in the later stage of the algorithm, because it is close to the global optimal point, the convergence speed decreases, and the convergence range becomes smaller. This phenomenon is similar to the aforementioned changes in protein potential wells. The basis of the potential energy potential well of protein is the result of statistical analysis, and an accurate model cannot be obtained through calculation, which is not conducive to the establishment of the convergence model of particle swarm optimization, after research, it was found that when protein molecules are subjected to external forces, wave motions will be generated at the level of potential wells, this kind of motion also satisfies the phenomenon of potential good change at the atomic level, and this motion model is the basis for the evolution process of the proposed algorithm. The model is derived as follows:

In numerical analysis, the speed, at which a convergent sequence approaches its limit is called the convergence speed. This concept is mostly used in optimization algorithms; it is defined as the approach of an iterative sequence to its local optimum (assuming computing The speed, at which the process converges and can reach the optimal value) is an important indicator for evaluating the performance of an iterative method in this problem. The motion of the residues in the potential well space satisfies the kinetic Schrödinger equation as shown in

$$i\hbar \frac{\partial}{\partial t} \psi(\vec{r}, t) = \left[-\frac{\hbar^2}{2m} \nabla^2 + U(\vec{r}, t) \right]. \quad (1)$$

Then, equation (1) can be re-expressed as

$$i\hbar \frac{\partial}{\partial t} \psi(\vec{r}, t) = \left[-\frac{\hbar^2}{2m} \nabla^2 + H \right]. \quad (2)$$

The energy operator for the protein structure, that is, the Hamiltonian form of the system is shown in

$$H = H_{ex} + H_{ph} + H_{int}. \quad (3)$$

Since the Hamiltonian energy H corresponds to the energy of the folding state described by the wave function $p(r, t)$, at this time, the protein has a definite energy value, therefore, this energy state is a stationary state, in this case, the wave function $p(r, t)$ can be decomposed into the product of the spatial coordinate function and the time function of the residue, in a three-dimensional structure, the wave function $o(r, t)$ can be written as

$$\phi(\vec{r}, t) = \phi(\vec{r})f(t). \quad (4)$$

When the residues move in a one-dimensional potential well centered on the protein's minimum folding potential energy p point, the solution of the steady-state Schrödinger-Brownian equation of motion is shown in

$$\phi(Y) = \frac{1}{\sqrt{L}} e^{-(|Y|/L)}. \quad (5)$$

This is shown in

$$L = \frac{1}{\beta}. \quad (6)$$

Proof. Divide both sides of the equation by $p(Y)f(t)$, as shown in

$$ih \frac{1}{f(t)} \frac{d}{dt} f(t) = \left[-\frac{\hbar^2}{2m} \left(\frac{\partial}{\partial x} \phi(Y) \right)^2 + H \right] \frac{1}{\phi(Y)}. \quad (7)$$

Let the left and right sides of Equation (7) be equal to the constant E , then the left side can be solved as shown in

$$f(t) = Ce^{-(i/h)Et}. \quad (8)$$

Substituting into the Schrodinger equation, the special solution is shown in

$$\phi(\vec{r}, t) = \phi Y e^{-(1/h)Et}. \quad (9)$$

E is the energy, let $2m(E - H) = p^2$, then the solution is shown in

$$\phi Y = Ae^{i(p/h)x} + Ae^{-i(p/h)x}. \quad (10) \quad \square$$

3.2. Theoretical Analysis of Physical Fitness and Nutritional Support for Basketball Players. Nutritional support for basketball players' physical fitness refers to scientific, comprehensive and reasonable dietary nutrition, and targeted nutrient supplementation, in order to ensure the normal body metabolism and growth and development needs of basketball players, and provide the special nutritional needs of the body under heavy load training and competition conditions, promote the elimination of exercise-induced fatigue and physical recovery, this will help to improve the physical fitness of basketball players, comprehensive nutrition measures and methods to promote the maintenance of the best competitive state of basketball players [17].

Sports nutrition is special nutrition based on public nutrition, and as an important game, basketball must also follow the basic laws of general sports nutrition. This means that basketball player nutrition must be based on mass nutrition, basic theories, basic methods of general sports nutrition, and techniques. In fact, the physical fitness of basketball players is a highly integrated and comprehensive manifestation of endurance, speed, strength, agility, and special skills. According to the principles of universality and particularity of contradictions, we should carefully analyze the commonality and individuality of basketball and other sports in terms of physical fitness and the nutritional requirements determined [18]. Therefore, based on the results of sports nutrition research and the summary of practical experience, based on the personality of basketball sports, various possible ways of physical nutrition support for basketball players are discussed, as shown in Figure 2.

Prolonged exercise will cause the body to sweat a lot, lose a lot of electrolytes with sweating, and cause body dehydration to cause thermoregulation disorders, exercise-induced fluid balance disorders, and body temperature rise is important factors that lead to premature fatigue [19]. The characteristics of water metabolism of basketball players are that one is a large amount of sweat, and the other is a high sweat rate (high sweat per unit time).

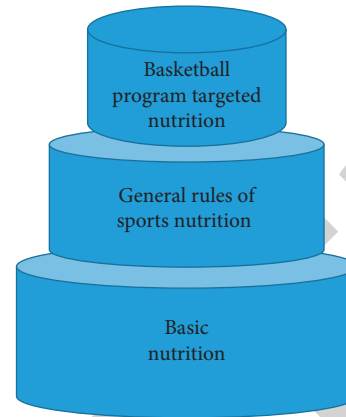


FIGURE 2: The composition of nutritional support for basketball players.

Research on the loss of water and inorganic salts through sweating during exercise and labor in hot environments has shown that, in the environmental activity with a dry bulb temperature of $39.2 \pm 1.7^\circ\text{C}$ and relative humidity of $53.2 \pm 6.3\%$, the average sweat rate is 8.2 mL/min , and the inorganic salts lost with sweat are shown in Table 1.

Analyzing the sweat composition of athletes who train in summer, it is also believed that the inorganic elements in the body are lost along with a large amount of sweating, which leads to the imbalance of the body's homeostasis and a series of functional disorders, resulting in decreased exercise capacity.

4. Results and Analysis

Take 30 young basketball male players as the survey object, and the specific data are shown in Table 2.

Continuously record the raw weight, cooked food weight, and the residual amount of all kinds of food within 5 days of 30 young basketball male players through the weighing method, and carry out accurate sorting and statistics, then, the per capita net food intake of the surveyed team members was calculated, and finally, the daily caloric energy and various nutrient intakes of the athletes were calculated using nutritional diet software [20].

The intake of caloric energy and caloric nutrients and the energy supply ratio of three meals in young basketball players. as shown in Table 3.

It can be seen from Table 3 that the energy supply ratio of caloric substances carbohydrates in the diet of young basketball players is 48.6%, the energy supply ratio of fat is 28%, and the protein is 23.4%. Compared with the recommended energy supply ratio of calorie substances for Chinese athletes: carbohydrates account for 50%~55%, fats account for 30%~35%, and proteins account for 12%~15%, the proportion of protein energy supply is significantly higher. The ratio of sugar to fat for energy is less than the recommended amount. The energy supply ratio of three meals for young basketball players is 20% for breakfast, 38% for lunch, and 42% for dinner. From the overall energy supply ratio of three meals, the proportion of breakfast is relatively small,

TABLE 1: The number of inorganic elements lost in 1L sweat.

Dry bulb temperature (°C)	Relative humidity	K	Na	Ca	Mg	Za	Cu
39.2 ± 1.7	53.2 ± 6.3	250.7 ± 11.2	1010.8 ± 18.3	71.8 ± 4.8	6.8 ± 0.8	0.98 ± 0.27	0.47 ± 0.15

TABLE 2: Survey objects.

Average age	15.3 years
Average height	196.8 cm
Average weight	81.6 kg

compared with 35% for breakfast, 40% for lunch, and 25% for dinner% of the basic dietary principles do not meet.

The intake of various nutrients by athletes is shown in Table 4.

When the intake of various nutrients reaches more than 80% of the supply, in order to ensure that the body will not be deficient, if it is below this level for a long time, there may be a deficiency. As shown in Table 4: among the three caloric sources of intake of young basketball players, the intake of fat and protein is relatively high, while the intake of carbohydrates is relatively low [21]. Therefore, it can be reflected from the survey results that, the intake of the three major nutrients of young basketball players is in an unbalanced state, and the intake of protein is too high, which shows that the dietary structure of young basketball players is based on high-protein dietary structure.

Plant protein is the general term for the protein contained in soybeans, peanuts and other fruits or oils, and herbs, and is one of the important protein sources for human beings [22]. From a nutritional point of view, it can be divided into complete protein, semi-complete protein, and incomplete protein, among them, complete protein refers to a type of protein that is rich in essential amino acids, has a complete variety, and has an irreplaceable role in growth and development, such as soy protein; incomplete proteins lack several essential amino acids, and the proportions usually do not match the needs of the human body, and most plant proteins belong to this type of protein [23].

Soybean protein is a high-quality protein, rich in lysine, while the content of sulfur-containing amino acids such as methionine is low, and the nutritional value is high. Soybean peptide is a soybean sports supplement made from soybean purified protein powder or fermented soybean dregs as raw material, through the compound enzymatic hydrolysis method, which converts macromolecular protein into polypeptide [24]. After enzymatic hydrolysis, soybean peptides can remove the beany smell of soybean protein and improve the taste of food, and can improve the stability and absorption of soybean protein. Walnut protein is rich in phospholipids. As a high-quality vegetable protein, its digestibility and utilization rate exceeds 85%, which is of great development and utilization value. In order to enrich the type of protein nutrition and improve the taste of beverages, a variety of plant proteins can be formulated into compound plant protein beverages prepared from black beans and walnuts. The seeds of *Ginkgo biloba* are rich in a variety of

TABLE 3: The proportion of the three major heat-generating sources and the proportion of energy supply for three meals.

The proportion of the three major nutrients (%)			The proportion of energy supply for three meals (%)		
Sugar	Fat	Protein	Morning	Middle	Night
48.6	28	23.4	20	38	42

nutrients and specific bioactive substances, among which the polypeptide component has a strong oxygen-free radical scavenging ability, which can delay aging. In recent years, the development of ginkgo protein compound beverages is also in progress, soy peptides, walnut protein, etc., can promote muscle growth, scavenge free radicals, and relieve fatigue [25].

The types of essential amino acids in animal protein are relatively complete, and the quantity and proportion are close to the needs of the human body, and the main component is casein, so it is easily absorbed by the human body. Compared with vegetable protein, animal protein has a more balanced amino acid composition, sports athletes should pay attention to supplementing animal protein in dietary nutrition. Milk is widely recognized as high-quality protein nutrition, whey protein has high nutritional value, is rich in essential amino acids, and has a complete range, at the same time, it is easy to absorb and has antioxidant effects, which can delay fatigue. The protein bar mainly uses whey protein as the basic raw material and is a solid high-protein product formulated with dietary fiber and probiotics. Silkworm chrysalis protein is rich in various nutrients such as essential amino acids and trace elements, which can not only supplement the body's nutrition but also help growth and development and relieve fatigue. Insect protein is rich in essential amino acids, easily digested and absorbed, and has multiple functions such as regulating immunity and strengthening muscles [26]. Protein supplementation is of course important for athletes, but it should not be excessive, otherwise, it will affect the metabolism of water and fat in the body. Therefore, athletes should choose high-quality protein according to their own needs and control the amount of protein.

Animal protein, with its complete essential amino acids and higher digestibility, is more in line with the needs of the human body, so its nutritional value is higher than that of vegetable protein. Athletes need to pay attention to supplementing high-quality protein, especially animal protein. However, the conversion efficiency obtained by converting plant protein to animal protein by animal husbandry is relatively low, such as the conversion efficiency of converting feed protein to pork is 15%, the conversion efficiency to egg was 31% and to milk protein was 38%, therefore, protein supplementation is also an important way for athletes to obtain high-quality protein [27].

TABLE 4: The comparison of the daily intake of the three major nutrients per person and the recommended supply.

Nutrients	Intake	Recommended supply	Intake/recommended supply standard (%)
Calories (Kcal)	3388	4200	80.7
Sugar	304.8	640	48
Protein	147	140	104
Fat	176	120	147
Saturated fatty acids (g)	36.2		
Monounsaturated fatty acids (g)	47.4		
Polyunsaturated fatty acids (g)	77.7		

Supplementing high-quality protein in time after completing training every day is conducive to the synthesis of muscle protein, but the intake of protein should not be excessive, and the protein-calorie supply should be 10% of the body's total energy demand. Excess protein will be converted into fat form and stored, causing hyperlipidemia, thereby increasing the risk of hypertension and coronary heart disease, and may also induce increased expression of serum aspartate aminotransferase and alkaline phosphatase, thereby endangering the cardiovascular system and liver, it is not conducive to the metabolism of water and fat in the body [28]. High-quality protein that can be quickly absorbed by the human body can well promote the synthesis of muscle protein after training athletes, such as whey protein, etc. Usually, there is no need to purchase expensive protein nutrition such as protein powder.

Protein residues such as branched-chain amino acids are beneficial to the body mechanism of athletes, in dietary nutrition, supplementing with leucine, quinine, etc., or taking appropriate amino acid sports supplements can help accelerate protein synthesis, and slow down protein breakdown, it is important for muscle recovery after exercise. Supplemented amino acids must be deficient in the daily diet, otherwise, it may cause amino acid imbalance, resulting in decreased appetite. The harm of amino acid imbalance is still unclear, but it should be avoided as much as possible.

Muscles are stimulated after training, which can effectively promote protein synthesis, and the process lasts for 24 hours. Therefore, athletes should ensure a wide intake of protein throughout the day, not just a large amount of protein nutrition needed for dinner.

At this stage, high-level basketball competitions in China are characterized by a short training preparation period and a long competition period, sports teams frequently travel to and from the venue during the season to play home and away games. The fatigue of the journey and the fatigue after the game, it has a great impact on the physical state of athletes, how to solve the dietary nutritional supplement of athletes between the competition grounds, it guarantees that the physical fitness of the athletes during the journey will be conducive to the development of on-the-spot competitive ability. Therefore, it is necessary to enhance the nutritional recovery of athletes during the journey, as shown in Figure 3.

Due to the relatively large amount of daily exercise in sports athletes, the protein decomposition and protein synthesis and metabolism of athletes during exercise will increase, the activity of hypertrophic enzymes in sports

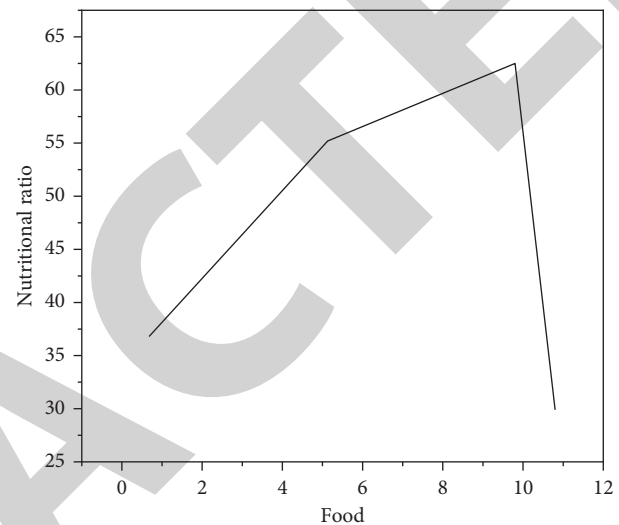


FIGURE 3: How to address the nutrition of athletes during travel (%).

organs will increase, and the entire process of hormone regulation will become more active. When the training volume is increased, the excretion of sulfur and nitrogen in the urine of athletes increases, at this time, the body may have a negative nitrogen balance, and the content of serum protein and hemoglobin will decrease, so protein needs to be supplemented in time. Athletes should maintain a high-protein diet, and the specific content of protein intake should be determined according to the specific exercise intensity. Protein is mainly divided into animal protein and vegetable protein, among them, animal protein has higher nutritional value and rich sources, it is mainly based on various meats, including mutton, beef, chicken, and fish. Sports athletes can give priority to animal protein. The nutritional value of plant protein is relatively low, but it is more economical, and there are also some plant proteins with relatively high nutritional value, such as beans, athletes can also choose beans to match their meals reasonably. Athletes should maintain a certain amount of protein intake every day, but the amount of protein intake should not be too much, if the athlete consumes too much protein, it will be converted into fat and stored in the body of the athlete, increasing various diseases and endanger the cardiovascular system of athletes. Generally, ensure that the protein-calorie supply reaches about 10% of the body's total energy demand. When choosing high-protein foods, be sure to choose ones that are easily absorbed by the human body, such as whey

protein, so that athletes can better promote muscle protein synthesis after training.

Protein is essential for the normal physiological functions of the human body, it has a very important role and is an important component of the human scaffold. For sports athletes, they have a higher demand for protein than ordinary people, therefore, it is necessary to maintain sufficient protein in the diet, so it is necessary to reasonably match the protein in the diet and to scientifically calculate the amount of protein that needs to be ingested according to the specific needs of sports athletes, it should not be too little or too much, protein nutritional supplements. High-quality protein is not unfamiliar. The amino acid pattern of this type of protein is closer to that of the human body, which means that high-quality protein can be better absorbed and utilized by the human body in the human body, so the nutritional value is also high. Such animal protein in eggs, milk, meat, fish, and vegetable protein such as soy protein, can maintain good health, promote physical growth and development, and are also essential for weight control and maintaining a healthy weight.

5. Conclusion

Athletes perform high-intensity sports training for a long time, in the state of high-intensity competition, the body's energy metabolism is strong, the protein consumption rate is high, the loss of water and electrolyte nutrients is large, and various nutritional supplements are required. At present, functional beverages on the market are prepared from various ingredients such as water, vitamins, amino acids, and inorganic ions. Protein foods can preserve protein, water, electrolytes, and other nutrients, supplement various nutrients for the body, help strengthen muscles, relieve exercise fatigue, improve immunity, etc., which are of great significance to athletes.

Sports nutrition food has developed rapidly in recent years, and research has gradually shifted from a single nutritional supplement to a variety of nutritionally balanced supplements, from simple processing to more and more emphasis on product quality, taste, and safety. Protein nutritious food has many functions, such as promoting athletes' muscle synthesis, promoting muscle damage repair, relieving exercise-induced fatigue, and improving immunity, it plays an important role in improving the physical mechanism of athletes, and has become a hot spot in the research of sports nutrition food. Also, excessive protein intake will also affect the fat metabolism of sports athletes, which is not conducive to their physical mechanism and exercise ability. Therefore, it is also necessary to supplement protein scientifically and reasonably and formulate a personalized scientific dietary protein nutrition plan according to the different types of athletes, so as to maximize the benefits for athletes.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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