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Research Article

Influence of Network Multimedia Nutritional Supplements on Basketball Exercise Fatigue Based on Embedded Microprocessor

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Sports can cause the consumption of energy materials in the body. The rational use of nutritional supplements can maintain the homeostasis of the organism, which plays a very important role in improving the competitive performance of sports athletes. The purpose of this study is to explore the effect of nutritional supplements on basketball sports fatigue. The method of this study is as follows: first of all, 15 basketball players in our city were selected as the experimental objects, and they were randomly divided into the experimental group and the control group. The members of the experimental group took nutrients. After the training, 6 days a week, 3 hours in the morning and 3 hours in the afternoon, and the rest was adjusted on Sunday. Before training, four weeks and eight weeks of training, the blood routine indexes and body functions of athletes were tested. The results showed that the number of red blood cells, hemoglobin concentration, and average hemoglobin concentration of ligustilide supplement of the athletes were at the level of 0.05 after 4 weeks and 8 weeks, and the difference was significant ($P < 0.05$). The nutritional supplements were used in sprint (3.4 s less), long-distance running (12.8 s less), and weight lifting (6.2 kg more) to a certain extent. Nutritional supplements are used as an auxiliary means of diet to supplement the amino acids, trace elements, vitamins, minerals, etc. required by the human body. The conclusion is that nutrition supplement can effectively improve the indexes of athletes' body in about four weeks, but the effect is not obvious after a long time. This study provides a certain method for the research of nutritional supplements in the field of sports.

1. Introduction

Basketball is a kind of high-intensity sports, accompanied by fierce confrontation, a large number of sports, and the rapid conversion between attack and defense. After high-intensity exercise, the body will be tired. If the body recovers excessively, it will eventually get the training effect and improve the sports level. With the development of basketball getting better and better, the competition level of players is getting higher and higher. The intensity and amount of exercise of athletes have reached a very high level. In sports, the physical ability to use oxygen will affect the competitive ability of athletes. Therefore, many experts and scholars have carried out a detailed study on the nutritional supplementary food for athletes, especially the nutritional supplementary food for promoting energy metabolism.

Multimedia technology is a technology that combines computer and video technology; uses computers to comprehensively process various kinds of information such as text, graphics, and music; and establishes logical relationships and human-computer interaction. It includes both sound and image media [1]. Among them, video, as the main body of multimedia applications, plays a vital role in improving people's sensory experience. In the embedded field, the media processor needs to strictly control the cost and power consumption on the basis of both high efficiency and flexibility, in order to better meet the demand.

In the research of basketball and nutritional supplements, Edwards et al. think that basketball makes athletes frequently carry out high-intensity sports in training and competition, including sprinting, jumping, accelerating, decelerating, and changing direction, resulting in acute fatigue and chronic fatigue. Practitioners can quantify

basketball players' workload and subsequent fatigue levels in order to monitor and manage fatigue levels, which may help to maintain high levels of athletic performance and prevent adverse physical and physiological training adaptations. They discuss potential workload and fatigue monitoring strategies in order to effectively optimize and maintain training and performance throughout the basketball season. Their method lacks experimental proof and persuasiveness [2]. Joy et al. believe that increased ATP levels can promote exercise-induced muscle proliferation and fat loss, and caffeine is a known energy supplement. A new supplement containing ancient peat and apple extracts has been reported to enhance mitochondrial ATP production, and it is combined with the slow-release effect of caffeine [3]. The aim of Jagim et al.'s study was to determine whether short-term intake of multicomponent preexercise supplements (MIPs) affects strength performance and anaerobic running ability [4].

The innovations of this article are reflected in the following: (1) Three main mechanisms of sports fatigue are introduced, and the characteristics and classification of sports nutrition supplements are described, including four nutrients. (2) Several nutritional supplements are cited: whey protein, L-carnitine, branched-chain amino acids, and glutamine. The controlled variable method is used to conduct blood routine and physical function tests. (3) And the results of basketball players before and after taking nutritional supplements and the impact of ligustilide nutritional supplements on athletes' blood routine are explored. At the same time, the influence of nutritional supplements on the physical fitness of basketball players and the influence of different nutritional supplements on the physical fitness of basketball players are also explored.

2. Sports Fatigue and Nutritional Supplements

2.1. Mechanism of Sports Fatigue. Among them, the main manifestations of exercise fatigue are as follows: (1) the concentration of ATP decreases, and certain oxidase activities in the brain are inhibited; (2) the decrease in the ratio of tryptophan and branched-chain amino acids in the blood will affect the increase in the level of serotonin in the brain and cause the inhibition of the brain; (3) during exercise, the circulation of amino acids and purine nucleotides in the body is strengthened, and the ammonia content in the brain is increased. Sports fatigue can be divided into physical fatigue and psychological fatigue in the human body. These two different types of fatigue have different manifestations. Physical fatigue is mainly manifested as a decrease in exercise capacity; psychological fatigue is mainly manifested as a change in behavior. According to the material and energy metabolism characteristics of different sports events, sports events can be divided into five types of metabolism (protophosphate metabolism type, phosphate glycolysis type, glycolysis type, glycolysis aerobic metabolism type, aerobic metabolism type). There is a certain regularity in the fatigue of different sports. The fatigue of short-term maximum intensity exercise is caused by the decrease of ATP conversion speed in the metabolism of muscle cells or the inability of some motor units to participate in contraction. Long-term moderate-intensity exercise fatigue is often related to the inhibition of the process of energy reserve utilization. The method to eliminate fatigue is to eliminate fatigue by adjusting the function state of the nervous system, such as sleep, qigong, psychological recovery, relaxation exercises, and music therapy. By replenishing the material that the body loses in large amounts during exercise, it promotes the elimination of fatigue, such as oxygen inhalation, supplementation of nutrients, and the use of certain Chinese medicines to regulate body functions.

There are many theories about the mechanism of exercise-induced fatigue, such as energy consumption theory, nerve fatigue theory, internal environment stability obstacle theory, metabolism product accumulation theory, free radical theory and so on. Among them, free radical theory mainly expounds that the by-products produced in the process of biological metabolism react with specific chemical substances in the body, which will cause damage to organisms. Increasing oxygen consumption after exercise or activating specific signal pathway are the main reasons for ROS. Free radicals refer to the group containing non pair electrons in the external electron orbit. If the body's ability to remove free radicals is exceeded, the antioxidant level of the tissue will decrease and the body will produce oxidative stress [5, 6].

The oxidation pressure caused by free radicals is one of the main causes of exercise-induced fatigue. The main mechanisms are as follows:

(1) Excess free radicals produced by exercise can cause lipid peroxidation damage to the cell membrane and other biofilms; change membrane fluidity, transparency, and integrity; and destroy cell and intracellular functions

(2) Biological macromolecules (proteins, DNA, etc.) that attack the body cause structural changes and loss of function

(3) Respiratory chain and other functions are reduced. Excess ROS is regulated by a variety of pathways in the muscle and other tissues (effects of ROS on muscle fiber membrane function, sr-Ca^{2+} pathway, Ca^{2+}-tapase pathway, mitochondrial-related death pathway, etc.) [7]

The mechanism of ROS-induced death has been a hot research topic. Bcl-2, Bax, and p53 can prevent a series of death caused by oxidative stress by regulating antioxidant pathway. Bcl-2, Bax, and p53 can cause oxidant and redox reactions due to hindering of the reaction of free radicals and blocking of the transfer of electrons from oxidants, and at the same time, they can reduce the motor exhaustion caused by free radicals. Therefore, the supply of antiacid substances plays an important role in the improvement of aerobic exercise ability and physical function of healthy people, especially athletes, in promoting the recovery of sports fatigue.

In the motion-adaptive deinterlacing algorithm, the deinterlacing method of the pixel to be interpolated needs

to be selected adaptively according to its motion state, and the motion state needs to be classified by motion detection [8]. Among them, the motion-adaptive deinterlacing algorithm can judge the motion state of pixels by the grayscale change of related pixel blocks, so as to avoid noise interference and have certain robust characteristics [9]. The relevant pixels with the same polarity as the pixel to be interpolated are calculated.

$$P = \left| \frac{\sum_{i=-1}^{1} T_i(n) + \sum_{i=-1}^{1} B_i(n)}{2} - \frac{\sum_{i=-1}^{1} T_i(n-2) + \sum_{i=-1}^{1} B_i(n-2)}{2} \right|,$$
$$Q = \left| \frac{\sum_{i=-1}^{1} T_i(n) + \sum_{i=-1}^{1} B_i(n)}{2} - \frac{\sum_{i=-1}^{1} T_i(n+2) + \sum_{i=-1}^{1} B_i(n+2)}{2} \right|. \tag{1}$$

The relevant pixels with different polarities from the pixels to be interpolated are calculated, and the process is as follows:

$$R = \left| \sum_{i=-1}^{1} X_i(n-1) - \sum_{i=-1}^{1} X_i(n+1) \right|. \tag{2}$$

Based on this, the three correlation coefficients are weighted to avoid false motion detection results, as shown below:

$$M = \begin{cases} R & P < T_1 \quad \text{and} \quad Q < T_1, \\ \text{median}(P, Q, R) & \text{others}. \end{cases} \tag{3}$$

The space-time weights in different motion states are calculated using the following formula:

$$a = \begin{cases} 1, & M < T_1, \\ \left[\cos\left(\pi \cdot \frac{M - T_1}{T_2 - T_1} \right) + 1 \right], & T_1 \le M < T_2, \\ 0, & \text{Others}. \end{cases} \tag{4}$$

Median filtering is performed on the three pixels in a row above the pixel to be interpolated.

$$F_1 = \text{median}(S(i-1, j-1), S(i, j-1)). \tag{5}$$

Median filtering is performed on the three pixels in the next row of the pixel to be interpolated.

$$F_2 = \text{median}(S(i-1, j+1), S(i, j+1)). \tag{6}$$

Median filtering is performed on the results F_1 and F_2 obtained in the first two steps, and the$S$is obtained from the previous round of deinterlacing:

$$S_{\text{high}}(i, j) = \text{median}(S(i-1), F_1, F_2). \tag{7}$$

Wiener filtering is performed on three adjacent pixels in the direction of motion:

$$F_{\text{wiener}} = \text{wiener}(A, B, C). \tag{8}$$

The calculation process is as follows:

$$F_{\text{wiener}} = w(0) * C + w(1) * B - w(2) * A. \tag{9}$$

The final calculation result of the Wiener median filter is obtained:

$$S_{\text{low}}(i, j) = \text{median}(F_{\text{wiener}}, E, D). \tag{10}$$

Finally, it is transformed into the optimization problem solving

$$\max \sum_{i=1} \lambda_i - \frac{1}{2} \sum_{i,j=1}^{n} \lambda_i \lambda_j y_i y_j \langle x_i, x_j \rangle. \tag{11}$$

We introduce an insensitive loss function; the expression is as follows:

$$L_\phi(y, f(x)) = (|y - f(x)| - \phi, |y - f(x)| - \phi > 0. \tag{12}$$

The soft boundary method is adopted, and the relaxation factor is introduced. Here, the upper and lower relaxation factors are used, so the optimization problem is obtained:

$$\min \frac{1}{2} \|w\|^2 + C \sum_{i=1}^{l} (\lambda_i + \gamma_i),$$
$$\text{s.t.} \begin{cases} yi - \left(w^T x_i + b\right) < \tau + \lambda_i, \\ \left(w^T x_i + b\right) - y_i < \tau + \gamma_i, \\ \lambda_i, \gamma_i \ge 0. \end{cases} \tag{13}$$

2.2. Characteristics of Sports Nutrition Supplements. Sports nutrition supplement is a kind of nutritional supplement introduced in China in recent years. People do not know much about it. These used to be mainly used by professional athletes. The general sports population and its utilization rate are very low, which leads to some people's misunderstanding. After the national sports nutrition food standard (GB/T 24154-2009) was formally implemented, there are more detailed provisions on the experimental methods used in the development of sports nutrition food, the calculation method of energy and carbohydrate, and the label. It is clearly pointed out that substances prohibited by the World Anti-Doping Agency should not be included in sports health products [10, 11].

Sports nutrition supplementary food is a kind of high purity or concentrated nutrient widely contained in food. These foods are special foods with nutrition consistent with the physical needs of the sports audience, slightly different from ordinary food and healthy food.

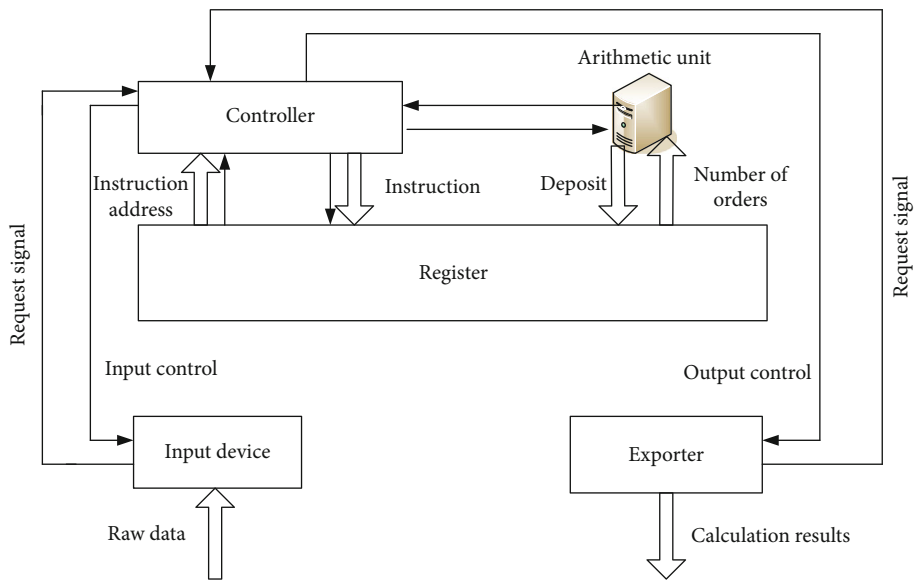

Figure 1: Computer components.

According to the results of a lot of information, sports nutrition food is totally different from "stimulants" and "drugs." Doping is a part of the doping that some athletes take in the early stage in order to improve their sports ability. Because they are stimulants, other kinds of drugs will be banned later, but these drugs are exciting results that cannot be made. There are some opposite effects with inhibitory effects, but they are generally referred to as stimulants in the world. As a result, drugs commonly known as stimulants are no longer called stimulants but are more general terms for drugs that are not allowed to be used in competitions [12].

2.3. Embedded Microprocessor. Generally, general-purpose microprocessors mainly include the processor core and peripheral devices. Processor peripheral devices mainly include instruction cache and data cache, instruction memory management unit and data, power management unit, power management unit, and debugging unit. Figure 1 is a block diagram of the computer. Embedded microprocessors evolved from CPUs in general-purpose computers. Its characteristic is that it has a 32-bit or more processor, with higher performance, and of course, its price is correspondingly higher. Embedded microprocessors were born in the late 1970s and experienced four major development stages: SCM, MCU, networking, and software hardening. Generally speaking, embedded processors have the following characteristics: strong real-time multitasking support capabilities, storage area protection functions, expandable microprocessor structure, strong interrupt processing capabilities, and low power consumption.

There are two types of processor bus structures: one is the von Neumann bus structure, and the other is the Harvard bus structure. The difference between them is shown in the figure. The instructions and data in the von Neumann bus share a bus [13]. Operation and data operations cannot be performed at the same time; while the Harvard structure separates instructions and data, each occupying a bus, instruction operations and data operations can be performed at the same time, which improves the performance of the processor. The design of this article considers that the instructions of the processor are often memory access to instructions, so the performance of interacting with data will have a great impact on the processor, so choosing the Harvard bus structure will significantly improve the performance of the processor. The two processor structures are shown in Figure 2:

The processor has the following bit registers, as shown in Table 1.

In most cases, the processor can use any one or more of the general-purpose registers, where the general-purpose registers can be accessed by all instructions, and the general-purpose registers can be accessed by all bit instructions.

The embedded microprocessor core adopts the Harvard structure which does not interfere with the instruction flow and the data flow, which improves the data processing capability. The external configuration can configure single and dual interfaces and mount external interface devices. Figure 3 is a diagram of the overall system architecture.

2.4. Examples of Nutritional Supplements. Among them, nutritional supplements can be divided into nutrient supplements and dietary supplements. Nutrient supplements are preparations for supplementing the body's nutrient deficiency or other special needs. It can be composed of amino acids, polyunsaturated fatty acids, minerals and vitamins, or one or more vitamins or minerals. Dietary supplements refer to products that supplement dietary insufficiency or special needs. Some people have health problems such as malabsorption of nutrients, such as liver disease that may affect appetite or the absorption, utilization and excretion of nutrients, surgery that may raise the demand for certain nutrients, and some medications such as antacids, antibiotics, laxatives, and diuretics that interfere with the absorption of nutrients. These individuals should consider the use

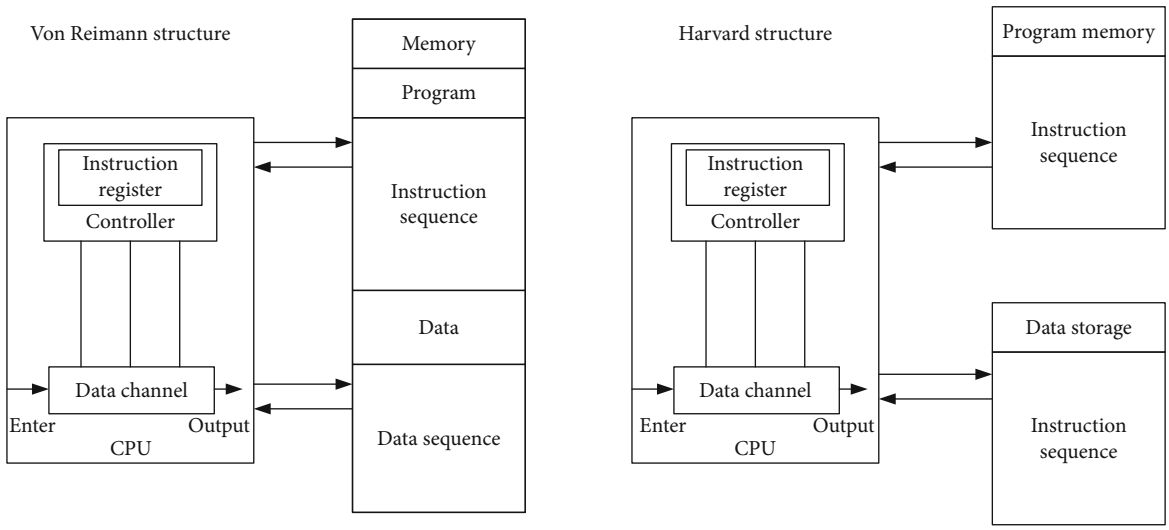

Figure 2: Two different processor architectures.

Table 1: Register list.

Serial number	Register classification
r0 r1 r2 r3 r4 r5 r6 r7	Low register (general purpose register)
R8 r9 r10 r11 r12	High register (general purpose register)
r13(SP)	Stack pointer
r14(LR)	Connection register
r15(PC)	Program technical register
xPSR	Special status register

of nutritional supplements. Nutritional supplements are not a substitute for a normal three-meal diet. The nutrients in natural foods such as vegetables, fruits, and meat are the most comprehensive, so first of all, we should eat three balanced meals and get the nutrients we need from a balanced diet. Under normal circumstances, if a person does not have bad habits, and the diet is coordinated and well absorbed, there is no lack of nutrients and certainly no need to supplement. Some people have poor absorption of nutrients for some reasons, or the absorption of nutrients should be increased with appropriate supplementation.

2.4.1. Whey Protein. Whey protein is the ultimate source of protein and the highest quality protein. Xanthin contains many branched-chain amino acids. Yellow protein is much better than all other proteins. Provide the body with the most suitable amino acid distribution for muscle structure, strength, and recovery. Bodybuilders and professional athletes know that whey protein supplements can increase muscle mass and training intensity and speed up recovery.

Whey protein is quickly absorbed by the body and can quickly reach where it is needed. Vitamin A supplements play an important role in nutrition after training. Vitamin A helps the body's muscle recovery, which mixed with protein in the human immune system also has antioxidant function, so regular supplementation of the right amount of protein can achieve the role of strengthening the body's immune system. Positive effects of probiotics in the body are as follows: increased muscle mass, decreased muscle mass after exercise, and increased metabolic rate [14].

Whey protein supplements can be used in people. Protein is traditionally used in athletes and bodybuilders because of its ability to promote muscle growth. However, with the development of new scientific research, Hollywood protein has been used in other fields. Some of them include weight loss, cancer treatment, baby health, wound treatment, and care for the elderly. In fact, anyone can benefit from Hollywood supplements. People who need to improve their protein levels get the most benefit from whey replenishment. These benefits include men and women at all levels of Sport (elementary to professional), bodybuilding and muscle coaches, endurance athletes, people with weight loss programs, and vegetarians with weight training.

2.4.2. L-Carnitine

(1) *Support weight loss.* L-Carnitine is famous for its fat burning characteristics. The natural compound has the effect of moving long-chain fatty acids into mitochondria, which are used as fuel. The researchers found that carnitine from the mouth increases energy and reduces fat, which supports muscle growth.

(2) *Improve physical performance.* There is a lot of controversy about the benefits of L-carnitine on physical ability. However, this compound can improve cardiovascular health, physical strength, and exercise ability. For decades, bodybuilders and athletes have been using L-carnitine products. Many people claim that this natural substance can help improve the performance of the gym.

(3) *Improve cardiovascular health.* L-Carnitine supplements can maintain heart health and reduce the risk of stroke, bloody heart failure, and arrhythmia. They can also improve the ability to exercise in patients with heart failure. Most of the causes of sudden death

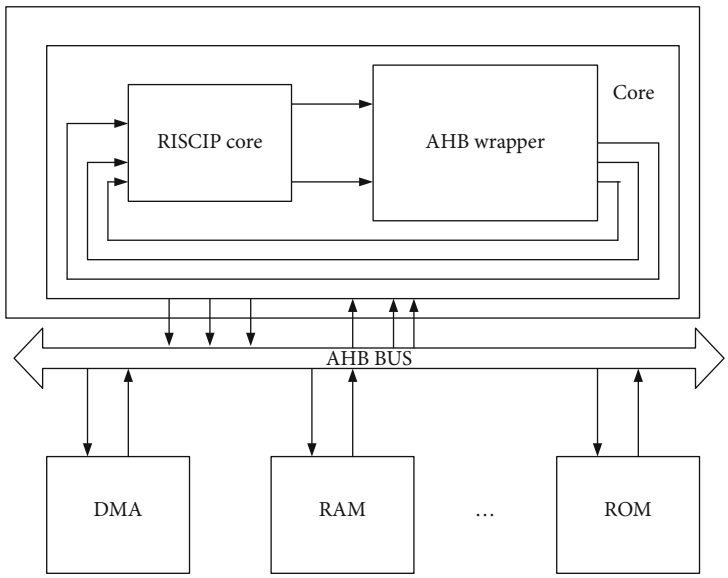

Figure 3: The overall framework of the system.

of athletes are heart attack, abnormal coronary artery, or cardiac hypertrophy. Coronary artery occlusion may affect athletes over the age of 30. L-Carnitine supplementation can prevent these diseases and protect the heart [15].

Effects of L-carnitine on body composition. The increase of fat will inevitably affect the performance of athletes. L-Carnitine can promote the utilization of fat, reduce the content of body fat, increase the body weight except fat, and improve the sports ability by transferring fatty acids to the inner membrane of mitochondria.

Carnitine and anaerobic metabolism. In bodybuilding, most training is anaerobic exercise. During intense exercise, under the condition of tissue ischemia and hypoxia, fatty acid CoA will accumulate, long-chain fatty acid carnitine in mitochondria will also accumulate, and large consumption will reduce free carnitine. The accumulation of fatty coenzyme A leads to structural changes in cell membranes, which can enhance the permeability of cell membranes, and the disruption of the membrane phase can cause cell necrosis, which may have an impact on anaerobic metabolism in humans. Sufficient free carnitine can put the accumulated fat CoA into mitochondria, reduce the hindrance of nucleotide aminotransferase, and smoothly carry out oxidative phosphorylation. Taking L-carnitine can relieve the fatigue of wrestlers, improve the recovery speed of the body, and improve the anaerobic exercise ability of the body. In addition, L-carnitine can improve anaerobic activity by removing excess lactic acid. In the process of extreme exercise and extreme exercise, if the oxygen capacity exceeds the so-called "anaerobic threshold," the muscle will start to use the energy obtained under anaerobic conditions to generate lactic acid, reduce ATP synthesis, and cause muscle fatigue.

2.4.3. Branched-Chain Amino Acid (BCAA). Physiological function of BCAA. Amino acid is the basic component of protein. Without that, muscles cannot grow. Branched-chain amino acids or BCAA are special groups of amino acids. BCAA can reduce muscle fatigue, accelerate recovery, and promote protein absorption. After training, branched-chain amino acids are immediately consumed from the muscles. Taking it before or during training can delay fatigue. After exercise, it can reduce the muscle damage, make the muscle recover faster, and place the body in a state of assimilation.

Support protein synthesis. First, protein is synthesized using branched-chain amino acids. Protein decomposition and synthesis often occur. The storage of proteins often changes. This certain amount of protein flow is combined with increased amino acid oxidation to provide energy, which means a high demand for serine during exercise. Therefore, the possibility of muscle growth may not be fully exploited. BCAA nutrition products support protein synthesis as much as possible during exercise, reducing muscle loss.

BCAA helps to prevent protein decomposition and muscle loss and is also an excellent antialienation factor. This is especially important for people who lose weight. During these low calorie intake periods, the use of branched-chain amino acids is strongly recommended because of the reduced rate of protein synthesis and increased protein decomposition, which increases the risk of muscle loss.

Effect of BCAA on exercise performance. In the study of endurance athletes, BCAA nutrition reduced muscle breakdown. Other studies have shown that after muscle strength training, the dissimilation effect of the muscle will increase by 4-14 hours, and then, the muscle training will continue. When the assimilation period is larger than the dissimilation stage, the muscle mass and muscle strength will increase. Therefore, the amino acid supplements taken after training are very effective. In another study, blood amino acid levels in 10 men were compared with three groups. After training, one group took pure amino acids, another group took all protein, and the third group took protein and amino acids.

After 15 minutes, the circulating amino acids of the amino acid supplement group were much higher than that of the whole proteome. The researchers were concerned about whether these amino acids would be metabolized immediately in the kidney, but it did not happen. This suggests that even small amounts of BCAA supplements may be more beneficial to exercise than protein as a whole.

Branched-chain amino acids are competitive with each other in absorption capacity, so they must be supplemented at the same time to ensure maximum absorption. The consumption of branched-chain amino acids in the muscles during training is also very fast. Supplementing branched-chain amino acids before and/or during exercise can improve exercise capacity and delay fatigue. Taking branched-chain amino acids immediately after exercise or with a meal after exercise can reduce cortisol and quickly restore the level of branched-chain amino acids in muscles.

2.4.4. Glutamine. Glutamine can also play an important regulatory role in the process of protein metabolism and play a certain role in promoting protein synthesis. After protein decomposition, the decomposition efficiency may be reduced. In medicine, glutamate is mainly used to treat hepatic coma and also to improve children's intellectual development. In the food industry, monosodium glutamate is a commonly used food freshener, and its main ingredient is sodium glutamate. In the past, the production of monosodium glutamate was mainly carried out by the hydrolysis of wheat gluten, but now, it uses the microbial fermentation method for large-scale production.

Adjustment of the acid-base balance. Glutamic acid is the most important precursor of ammonia production in the kidney, which plays an important role in maintaining acid-base balance. The kidney acid-base neutralization reaction, in order to maintain acid-base urine, will be discharged from the body. The role of glutamic acid in physical activity is as follows: since most tissues have the ability to synthesize this amino acid, there is no shortage of glutamic acid in human body under normal conditions. However, the human body is in a state of high-speed metabolism when carrying out intense exercise and exercise. In this case, the protein of skeletal muscle is also in the state of high-speed decomposition, and various tissues and internal organs of the human body need a lot of consumption. Glutamic acid in the human body can lead to a serious shortage of amino acids, which directly leads to low immunity and low exercise ability.

The body will produce a lot of free radicals in sports, which will damage the structure of the model and affect the exercise ability. Glucose mannose is an important protective factor in the body, which protects the activity of glycocapsaicin. Glutamic acid can increase the synthesis of glutamic acid and protect liver tissue from free radical damage. The supplement of glutamic acid not only improves the stability of cell membrane but also increases the content of glutamic acid in the body, reduces the damage of oxygen free radicals to the liver, improves the antioxidant capacity of the body, and improves the exercise ability.

Glutamate is one of the amino acids used by the body in protein synthesis. The depletion of glutamate in muscle is closely related to the increase of muscle protein dissimilation. Glutamic acid is a very effective antidissimilation agent. If the concentration of glutamic acid in muscle is high; other amino acids cannot enter the link of glutamic acid production, thus maintaining the balance of amino acids in the body, which is conducive to protein synthesis.

3. Experiment on the Effect of Nutrition Supplement on Basketball Players

3.1. Research Object and Grouping. The object of our investigation is 15 high-level basketball players from our city. The average age of these male basketball players is 18-22 years old, the average height is 190.4 cm, the average weight is 88.5 kg, the average age of the game is 6 years old, and there is no personal or family history. 15 high-level basketball players were randomly divided into two groups: nutrition and health group (s) and control group (c), of which 8 were in the nutrition and health group and 7 were in the control group.

3.2. Training Program. During the experimental intervention period, the training was adjusted for 8 weeks, 6 days a week, 3 hours in the morning, 3 hours in the afternoon, and the rest time on Sunday. The training methods include 1-2 weeks of aerobic training, 3-4 weeks of mixed aerobic training, 5-6 weeks of anaerobic training, 7-8 weeks of technical and tactical training, and a small cycle of training procedures and comprehensive training.

3.3. Reagent Ratio. Ligustilide was extracted and refined in Xi'an Xuhuang Biotechnology. Ligustilide and 50% angelica polysaccharide were mixed in a 5 : 1 ratio. Each package contains 10 g of ligustilide and 2 g of 50% polysaccharide.

3.4. Index Test and Method. According to the training plan and competition time, there are three examinations. The examination time was before training, 4 weeks after training, and 8 weeks after training.

3.4.1. Blood Routine Test. The selected blood circulation index test was completed in Zhengzhou University Hospital. From 8:00 a.m. to 8:30 a.m., regular blood tests were conducted to collect venous blood. The blood routine is as follows: including lymphocyte, good base cell, good medium cell, lymphocyte, red blood cell, hemoglobin concentration, average red blood cell hemoglobin content, average red blood cell hemoglobin concentration, etc. The blood routine examination equipment model is a Mindray BC-580.

3.4.2. Physical Function Test. Before drawing blood, three physical tests were conducted according to the training plan and competition time. Basketball is an activity of high intensity and high competition. It is a combination of aerobic and anaerobic. Therefore, basketball players' physical strength test has 30 meters (s), 400 meters (s), and 15 meters (s). There are also bench pressure bed, squat, elevator, touch screen height, and other physical tests. The 30-meter test

Table 2: List of body composition of basketball fans before the experiment.

Index	Experimental group ($n = 8$)	Control group ($n = 8$)	P value
Age	29.12 ± 4.09	28.76 ± 4.46	>0.05
Height (cm)	172.18 ± 5.42	170.96 ± 4.87	>0.05
Weight (kg)	72.91 ± 6.08	73.36 ± 6.28	>0.05
Body mass index (kg/m^2)	25.45 ± 2.06	24.47 ± 2.12	>0.05
Body fat rate (%)	30.06 ± 2.38	31.27 ± 2.19	>0.05
Visceral fat area (cm^2)	80.24 ± 18.06	78.76 ± 19.37	>0.05
Basal metabolic rate (kcal)	1409.32 ± 121.56	1349.61 ± 115.28	>0.05
Skeletal muscle content (kg)	19.31 ± 2.21	20.27 ± 3.58	>0.05
T value	−0.1 ± 0.86	−0.02 ± 0.77	>0.05

method and procedure are as follows: the tester measures and marks the distance of 30 meters on the plastic truck.

The test object stands aside and starts to accelerate at full speed. After passing the scoring line, the score is recorded in seconds, accurate to two decimal places.

The 400-meter test method and steps are as follows: The test subject stood at a distance of 400 m from the starting point, and at the sound of the flute, began to run to the end. The tester records the results in seconds, accurate to the second decimal place. The 15 m test method and procedure are as follows: the tester uses tape to measure the distance of 15 m on the plastic truck. The pen is in a standing position and accelerates at full speed at the starting point. The tester records the time to pass the end point in seconds, accurate to two decimal places. The methods and steps of the bench press test are as follows: preparing a tool barbell and a pair of benches: the tester lies on the bench and tries to lift the maximum weight of the barbell. The barbell is slightly wider than the shoulders and the arm extension is increased to 0, and the times are recorded in hours.

(1) *Squatting test*: 1 squatting frame. The barbell of the squatting frame is adjusted to the maximum squatting strength, the barbell is placed on the shoulder and the barbell is held with both hands to control the direction. The angle between the thigh, waist, and abdomen is 90 degrees. The subject squats down until the body is upright. The number of times is recorded.

(2) *Lifting test*: the subjects stand up and adjust the barbell to the maximum lifting strength, with the barbell slightly higher than the head, and the arms fully extended. The times in hours are recorded.

(3) *Tensile test*: the ribs are kept in the horizontal bar at the rear, and the test object stands naturally facing the device. Then, swing your arms up, jump, open your hands to shoulder width, with one hand carrying the bar, and your body perpendicular to the appropriate surface. When the body is completely still, use both arms to lift at the same time. When the chin exceeds the upper end of the horizontal bar, return to the vertical position and complete once to the ground. The tester records the number of times the test object completes in time.

3.5. Mathematical Statistics Method. In this study, SPSS19.0 statistical software and one-way dispersion analysis were used for data processing. The test data of experimental group and control group were compared before and 4 weeks and 8 weeks after training. $P < 0.05$ was regarded as the effective difference. $P < 0.01$ is a very obvious difference.

4. Analysis of the Influence of Nutrition Supplement on Athletes

4.1. Analysis on the Changes of Basketball Players before and after Taking Nutrition Supplements. Table 2 shows the changes of body composition before and after the experiment.

The body weight of subjects who were intervened by sports nutrition and health care products increased by -3.2% to 72.90 kg before intervention and to 70.26 kg after intervention. Without the intervention of sports nutrition supplements, the body weight of the control subjects was 73.37 kg before the experiment and 73.23 kg after the experiment. The increase rate was -0.12%. Considering the average body fat content, the former was 22.38 kg before intervention and 20.44 kg after intervention, which decreased by 4.32%, while the latter was 21.39 kg before and 20.35 kg after intervention, increasing by 1.82%. Taking into account the body mass index excluding fat, the former was 51.74 kg before intervention and 50.24 kg after intervention, which increased by -2.9%. The former, taking into account body fat index, was 25.08% before intervention and 21.9% after intervention. Although there is no statistical difference between the experimental results of the two groups, on the whole, the former has greatly decreased.

As the body mass index (BMI) of the two groups increased, the body mass index (BMI) also showed an upward trend. The former was 25.59 kg/m^2 before intervention and 25.89 kg/m^2 after intervention. It increased by 1.19%. The latter was 24.43 kg/m^2 before the experiment and 25.74 kg/m^2 after the experiment. This is a statistically significant increase of 2.71%. Taking into account the fat area index of internal accounts, the former was 80.22 square centimeters before intervention, while the latter was 76.23

Table 3: Effect of ligustilide supplementation on main blood routine indexes of athletes ($n = 8$).

Index	Before the experiment	4 weeks	8 weeks
Number of red blood cells	4.94 ± 0.005	5.07 ± 6.39	5.07 ± 5.94
Hemoglobin concentration	147.4 ± 0.025	150.8 ± 5.8	151.6 ± 3.7
White blood cell	6.23 ± 0.066	6.34 ± 0.29	6.25 ± 0.27
Mean corpuscular hemoglobin concentration	337.25 ± 0.467	342.5 ± 5.738	342.8 ± 7.31
Number of lymphocytes	2.55 ± 1.935	2.53 ± 1.675	2.63 ± 2.817
Number of basophils	2.0 ± 1.57	1.66 ± 1.128	1.66 ± 0.119

square centimeters, a decrease of 4.43%. The latter was 78.77 square centimeters before the experiment and 76.26 square centimeters after the experiment, which decreased by 2.42 percentage points. Taking into account the average basal metabolic rate, both of them tend to increase. The former was 1409.21 kcal before intervention and 1567.48 kcal after intervention, which increased by 2.66%. The latter was 1349.56 kcal before the experiment and 1422.23 kcal after the experiment, which increased by 2.09%. The weight gain of the latter is greater than that of the former, and the increase of metabolic rate is smaller than that of the former. Taking into account the basal metabolic rate per kilogram of body weight, the former was 20.33 kcal per day before intervention and 1826 kcal per day after intervention. The increase rate was 2.45%, which was 21.73 kcal/kg before the experiment and 22.66 kcal/kg after the experiment, which decreased by 2.82%. Generally speaking, these indicators of the former tend to change.

4.2. Analysis of Ligustilide Nutritional Supplement on Athletes' Blood Routine. The results of nutritional supplementation on the main indicators of athletes' blood routine are shown in Table 3.

It can be seen from Table 3 that through the single factor analysis of the dispersion of the main blood routine indexes of the athletes supplemented with ligustilide, the average and standard deviations show that the number of red blood cells, hemoglobin concentration, and average red blood cell hemoglobin concentration of the athletes supplemented with ligustilide are after 4 weeks and 8 weeks. All the test results had a grade of 0.05, which was significantly worse than the first episode, $P < 0.05$. However, the comparative analysis of test results after 4 weeks and 8 weeks was meaningless, $P > 0.05$.

There was no significant difference in the number of leukocytes, lymphocytes, and basophils in the three test results at the level of 0.05, $P > 0.05$.

4.3. Analysis on the Influence of Nutrition Supplement on the Physical Fitness of Basketball Players. The comparison of the average running test results of the athletes with the supplement of nutritional supplements (n =8) is shown in Figure 4.

As can be seen from Figure 4, comparing the average values of the three test scores, it can be found that all kinds of performances of athletes have been improved. Among them, 400 m is compared with the test before 4 weeks and the test after 8 weeks. The difference of the test is obvious;

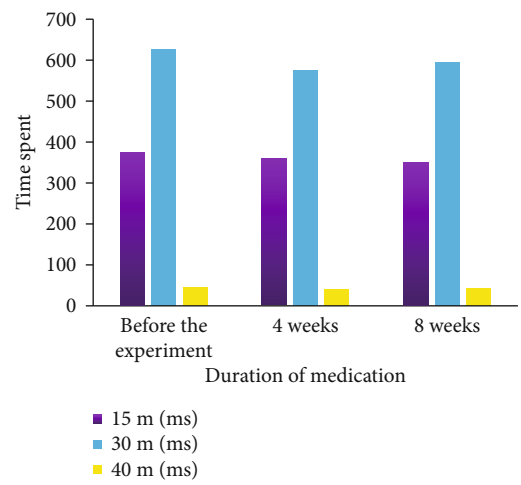

Figure 4: Comparison of the average results of running test by adding ligustilide ($n = 8$).

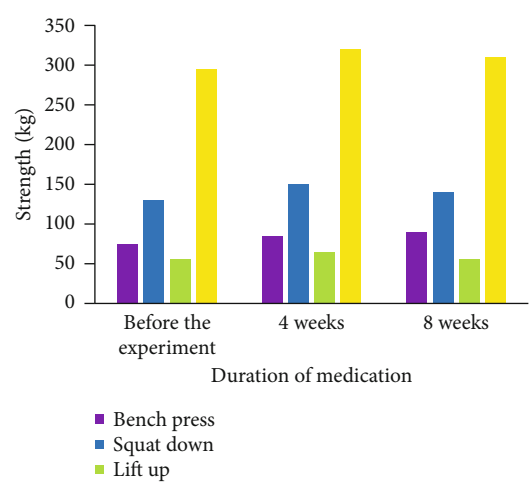

Figure 5: Comparison of ligustilide supplementation on strength value of athletes.

$P < 0.05$ means qualified. Short time training and supplement of ligustilide can affect 400 m athletes, but the test result of 400 m after 8 weeks is better than that after 4 weeks. The difference between the two was not obvious, $P > 0.05$. Although the performance of 15 meters has improved, the difference is not obvious. Four weeks later, the athlete's

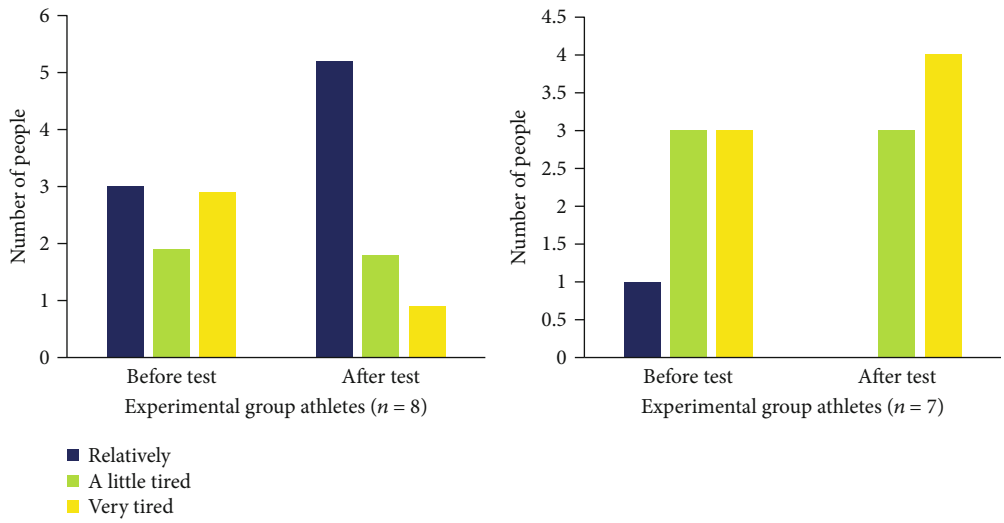

Figure 6: The results of athletes' subjective feeling of fatigue before and after 8 weeks of experiment.

performance improved rapidly. Eight weeks later, the performance of athletes continued to improve, but not as fast as the first stage.

As shown in Figure 5, the comparison of the test results of the athletes' strength value with the supplement of nutritional supplements is shown.

Through the comparison of the average results of the three tests in Figure 5, the results of the four tests of the supplement ligustilide athletes were improved after 4 weeks, of which only the results of the horizontal push continued to improve after 8 weeks, and the other three items were not as fast as those after 4 weeks, but the test differences of the four indexes were not significant, $P > 0.05$.

Figure 6 shows the results of subjective fatigue before and after 8 weeks of experiment.

It can be seen from Figure 6 that as per the histogram of subjective fatigue evaluation of the experimental group athletes before and after the experiment, the subjective fatigue evaluation of 8 athletes before and after 8 weeks of training shows that 3 people are more relaxed before the experiment and 2 people are slightly relaxed. Three people were very tired, 38% of them were more relaxed, 25% were a little tired, and 38% were very tired; after the experiment, they were more relaxed, 5 were tired, 2 were a little tired, 63% were very relaxed, 25% were a little tired, and 13% were very tired.

As the histogram of subjective fatigue evaluation of the group of athletes before and after the experiment, after 8 weeks of training, the subjective fatigue evaluation of 7 athletes before and after the experiment, 1 was more relaxed before the experiment, and 3 were slightly relaxed before the experiment. Three people were very tired, 13% were more relaxed, 38% were a little tired, and 38% were very tired; after the experiment, they were more relaxed, 0 was tired, 3 were a little tired, and 4 were very tired, so they were more relaxed. 43% were a little tired and 57% were very tired.

4.4. Analysis of the Effect of Different Nutritional Supplements on the Body of Basketball Players. Figure 7 shows the comparison of different nutritional supplements on athletes' physical recovery.

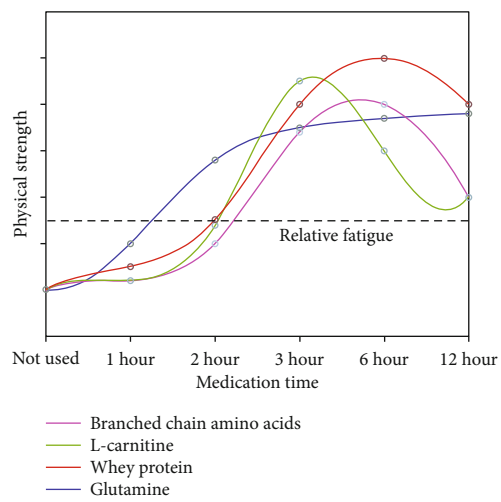

Figure 7: Comparison of different nutritional supplements on athletes' physical recovery.

It can be seen from Figure 7 that whey protein can reach the peak of recovery, that is to say, it can reach the best; the recovery speed of L-carnitine is faster than that of whey protein, and the elimination time is also faster; the branched-chain amino acids are a little worse than the former two; while the recovery speed of glutamine nutrition is the fastest, it still has effect after a long time, and the effect is long-lasting, and the lacking point is that the effect of the recovery state is worse than that of the first three.

We compared embedded and unprocessed multimedia business supplements with traditional supplement methods and compared the supplement effects under different technologies. In order to verify the corresponding results, we performed recovery speed, physical recovery value, and side effects on different groups of athletes. Perform statistics and

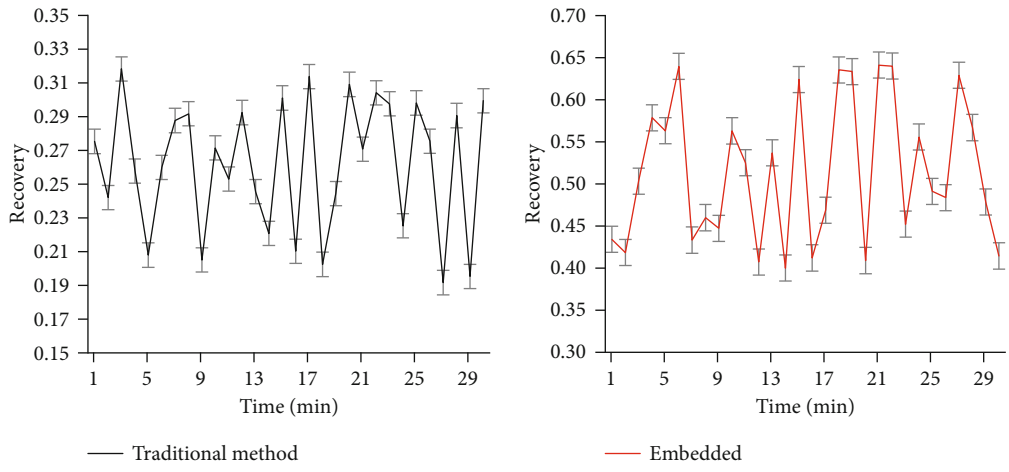

Figure 8: Recovery speed comparison.

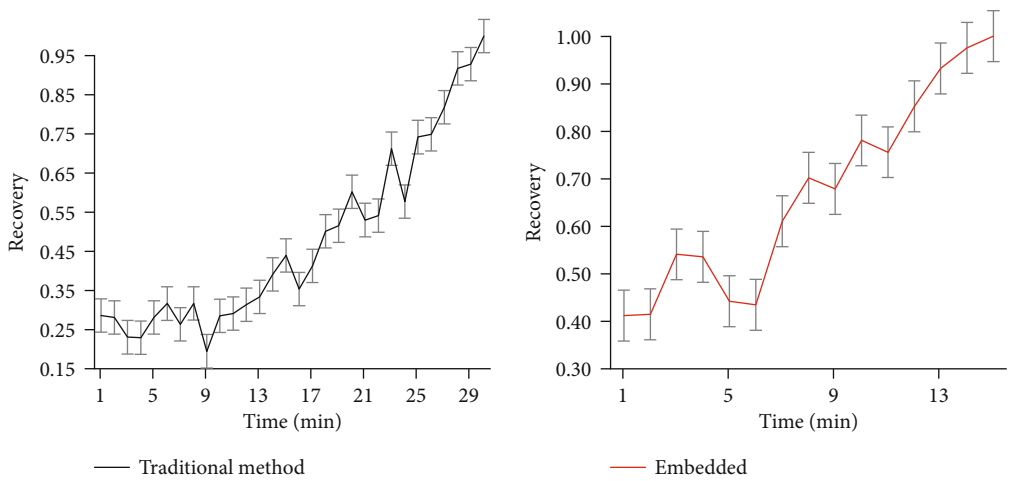

Figure 9: Schematic diagram of recovery effect.

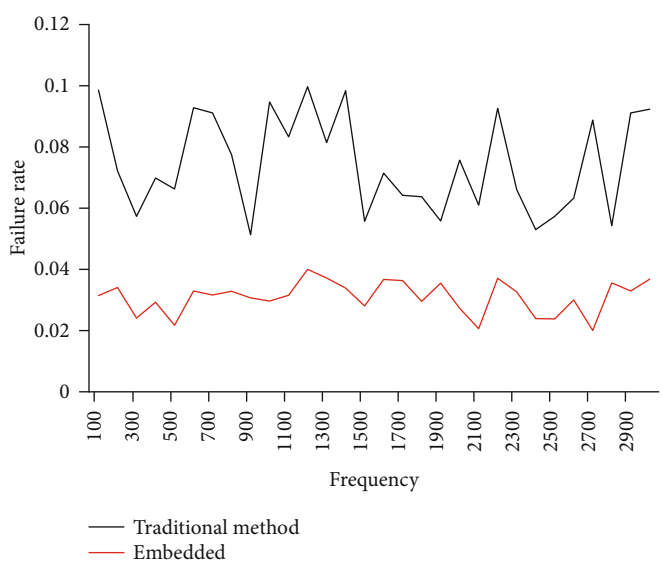

Figure 10: Unqualified rate of nutritional supplements.

the statistical results of the recovery speed are shown in Figure 8:

It can be seen from Figure 8 that the method used in this article is faster than the traditional method in terms of recovery speed, and the speed of improvement is more than 30%. For further comparison, we have made statistics on the recovery effect, and the results are shown in Figure 9.

It can be seen from Figure 9 that under traditional nutritional supplements, it takes about 30 minutes for athletes to regain their physical fitness, while the embedded and untreated nutritional supplements used in this article only take about 15 minutes. This shows that the method used in this article can improve the physical recovery of basketball players and relieve fatigue.

Of course, for a nutrient to be good, we should not only look at the effect but also observe the side effects that they may produce. Therefore, we have made statistics on the side effects of these two methods. The investigation and the results are shown in Figure 10.

It can be seen from the figure that in the traditional nutritional supplements, the unqualified rate of the product is at a higher position, but under the embedded untreated used in this article, the unqualified rate of the product is greatly reduced, and the unqualified rate is about 2%; thus, great progress has been made.

5. Conclusion

As a sports nutritional supplement, branched-chain amino acids will increase the tyrosine content in muscle significantly after using reasonable nutritional supplements, so as to promote sports function. Branched-chain amino acids have different effects on various sports. In addition to alleviating the increase of H^+ caused by exercise, the improvement of motor function, the effects on neuromodulation, antioxidation, glucose metabolism, and the increase of Ca^{2+} skeletal muscle sensitivity will also occur. The supplement method of branched-chain amino acids and the evaluation of its effect on motor function are uncertain and need further study. It is very important to have a comprehensive understanding of the role of branched-chain amino acids as sports nutritional supplements in the field of sports.

The supply of ligustilide has a positive impact on athletes' physical strength, promotes the recovery of fatigue, and lays a good foundation for the improvement of athletes' skills and tactics. The effect of resveratrol solid lipid nanoparticles on exercise fatigue was studied. It was proven that resveratrol had a good effect on relieving exercise fatigue. Solid lipid nanoparticles were used as the drug carrier of resveratrol. The solubility of resveratrol was greatly improved. This is very convenient for oral and quantitative medication and can better play the antioxidant activity in vivo.

No matter whether sports nutrition supplements are used in sports or not, the body composition of bodybuilders will be improved, but the only difference is that the two effects are different at the same time. The improvement of body composition cannot be completed in a short period of time. In order to obtain more satisfactory results for individuals, it is necessary to maintain good living habits and tacit coordination of exercise and nutrition for a long time. Due to the limitations of the conditions, this article lacks certain technical experimental analysis when exploring the influence of ligustilide nutritional supplements on athletes' blood routine. In the follow-up, we will further carry out a comprehensive exploration of it.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that there is no conflict of interest with any financial organizations regarding the material reported in this manuscript.

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