

The Effects of Fitness Drinks on the Performance of Football Players

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Abstract: With the development of world competitive sports, football, as an important part of international sports, has attracted the attention of many people. However, as a high-load sport, how to solve the problem of energy consumption in sports has become a top priority. The purpose of this article is to observe the effects of fitness drinks on the performance of football players based on mice experiments. This article introduces the characteristics of football and analyzes the role of sports drinks in sports metabolism. Then it researched the replenishment methods and timing of sports drinks, and then introduced the human physiological indicators. In the experimental part, eight healthy adult mice were used as experimental research objects to test the calm blood lactic acid, creatine kinase, heart rate and recovery value after exercise of each mouse under different sports drink supplements, and the recovery effect was tested. The experimental results prove that, although the test results are quite different from each other, on the whole, fitness drinks can promote the physiological indicators of football players to a certain extent. In this article, the effect of reducing creatine kinase was tested. The method of replenishing a sports drink every 20 minutes was the most effective. The value of creatine kinase was 18.

1. Introduction

In recent years, sports drinks have continued to be sought after by sports crowds, especially sports enthusiasts. It can be said that as long as there is a drink area, it will exist. As the major businesses in the advertising promotion have given it the magical effect of fast recovery of physical strength and anti-fatigue after sports, new varieties of sports drinks research and development and sales continue to grow, the development of sports drinks is in a hot state, and the market is highly competitive the sports drink market is booming.

Football is a high-load exercise in which the body resists intense, aerobic and anaerobic mixed

energy. Therefore, good physical fitness and physical reserve are the basis for a football player to complete the technical and tactical requirements in a high-intensity, high-confrontation game environment. In the process of material and energy metabolism in the state of exercise, in order to maintain the body's thermal balance, at the same time, the loss of body water and the loss of electrolytes in the body are increased. Therefore, according to the particularity of football, there should be a sports drink suitable for football to supplement the recovery during training [1-2].

Broughton, D's team aims to improve the status of the sale of sports drinks to children, and these products are not aimed at children. They distributed 183 self-finished questionnaires to four schools in South Wales. Children from grades 8 and 9 (12-14 years old) were recruited. The questions focus on the use of sports drinks, the type of consumption, the frequency and cause of consumption, and the place of purchase. The result is that a large proportion of children drink sports drinks regularly and outside of physical activity. Dental health professionals should pay attention to the popularity of sports drinks among children when providing health education advice or developing health promotion programs [3]. Baysal, S and his team believe that tracking multiple players is critical to analyzing football videos in real time. However, rapid lighting changes and occlusions between players that look similar from a distance make tracking very difficult in football. They introduced the concept of densely sampled shared particles at fixed locations in the model field. And the proposed tracking algorithm is embedded in a real football player tracking system called Sentioscope. Compared with previous methods, this algorithm is more successful in multi-target tracking with similar appearance and unpredictable motion patterns [4]. Dehghani, M's team considers improving athletic performance and reducing anxiety as one of the most important goals for athletes. Mindfulness Acceptance Commitment (MAC) approaches can address these limitations. The main purpose of this study was to determine the effectiveness of a method based on mindfulness acceptance commitment for students with increased athletic ability and athletic competition anxiety with 3 to 5 years of exercise experience. They found that a method based on mindfulness acceptance commitment is an effective intervention that can improve athletes' performance and reduce their avoidance and anxiety [5].

This article introduces the characteristics of football and analyzes the role of sports drinks in sports metabolism. In the experimental part, eight healthy adult mice were used as experimental research objects to test the calm blood lactic acid, creatine kinase, heart rate and recovery value after exercise of each mouse under different sports drink supplements, and the recovery effect was tested.

2. Proposed Method

2.1. Football

Football is a team sport. It is different from individual sports such as swimming, diving, running, and shooting. Team sports require coordinated combat among various athletes. Each athlete must not only ensure the good performance of his own technical actions, but also consider the same. Form good cooperation among teammates [6-7]. Football is one of the most typical team sports. Its game has the integrity of a large playing field and a large number of participants; fierce confrontation and fierce competition; diversified technologies, tactics, and variability; long competition time and amount of sports Great hardships and other characteristics. A football match is usually 90 minutes long. In a high-level football game, an athlete runs at a distance of 9,000-13,000 meters, a rapid sprint distance of more than 2500 meters, completes hundreds of technical moves, the athlete's heart rate is above 180 times / min for about 32 minutes, and the oxygen consumption exceeds 300 liters, caloric consumption of 1500-2000 kcal, the game is very difficult; each team has 11 players in the game, and the playing field is more than 8,000 square meters; modern football

matches are a battle for space and time. Fighters are often fleeting, and each player needs to adjust his technical moves and offensive or defensive strategies according to the constantly changing situation on the field; football is a typical open sport, but there are also points in football. Closed scenes such as balls are a sport that coexists with open scenes and closed scenes. To sum up, the football field is large, the number of participants is large, the players consume a lot, and the open sports scene and the closed sports scene coexist. The co-existence of these factors makes the form of football matches change rapidly and the sports situation is complex and diverse. Athletes' tactical choice is inseparable from the acquisition of information about their counterparts and opponents, the position of the ball, the technical characteristics and physical conditions of each player.

2.2. Sports Drinks

2.2.1. Sports Drinks

Sports Drinks are a type of life that usually contains a certain amount of sugar, and / or minerals, electrolytes, and flavorings, drinks that require basic nutrients [8-9]. In China, sports drinks are defined as soft drinks whose composition and content of nutrients can meet the physiological characteristics of people participating in physical exercise, physical labor, and special nutritional needs. At the same time, energy drinks with similar effects have appeared in the market, but strictly speaking, the two are essentially different. The reason is that the sugar content of functional drinks is generally higher than that of sports drinks. Non-nutritive ingredients such as caffeine, guarana extract, L-carnitine, and creatine play a major role. It can enhance the excitability, concentration of attention, and agility of the nervous system; at the same time, low-energy-density functional drinks are also used to increase material metabolism, and then play a role in maintaining / enhancing exercise capacity [10-11]. However, with the increase in sports performance requirements of sports people, especially professional athletes, caffeine and other ingredients are also added to many sports drinks to enhance nerve excitability and material metabolism levels in order to obtain greater muscle strength and longer the duration of endurance sports, and a considerable number of athletes will also use functional drinks as sports drinks when participating in sports, so that the definition and application are gradually blurred. For this situation, it is clear that the configuration of sports drinks is mainly aimed at the consumption of basic substances due to sports, so as to carry out a reasonable material ratio to supplement the body's needs, while functional drinks are mainly to enhance the utilization of substances and utilization efficiency, the two still have essential differences in the purpose of use [12].

2.2.2. Main Components of Sports Drink Products and Their Role in Sports Metabolism

(1) Water

Water is the most important and important ingredient in sports drinks. The water in the body plays an important role in maintaining vital signs such as blood pressure and body temperature. During the exercise of the human body, due to the increase of the body's metabolic rate and the participation of large muscle groups, the temperature of the body's core will rise rapidly, with the increase of water loss. An increase in core temperature will further increase heart rate and lung ventilation, increase energy consumption during breathing, and accelerate material consumption, which is not conducive to the maintenance of long-term exercise. At the same time, it can be accompanied by an increase in water loss. When the water loss exceeds 2% of the body weight, the aerobic endurance and technical action completion ability will be weakened. If it is further lost, fatigue, heat failure and other symptoms will occur. However, it is difficult to effectively reduce the temperature of the nucleus by relying solely on body surface cooling. Oral intake is the most

concise and effective way. Therefore, supplementing water is the most important purpose of intake of sports drinks. Regular and quantitative intake of water during exercise is of great significance for maintaining normal water content and preventing the occurrence of dehydration and heat failure and heat shock [13-14].

(2) Sugar

Sugars are divided into available sugars and unavailable sugars. The available sugars are mainly divided into monosaccharides (glucose, fructose), disaccharides (sucrose, maltose), medium-molecular sugars and high-molecular sugars; unavailable sugars mainly refer to macromolecular structure. Due to the lack of corresponding enzymes in the human digestive tract, they cannot be broken down into small molecular sugars, so they cannot be used by the body. This article mainly discusses the role of absorbed sugars in the human body, so the sugars mentioned below refer to available sugars.

Glucose is the most direct and fastest energy source during exercise, so it is reasonable and appropriate for athletes to maintain their blood sugar concentration and muscle glycogen storage level, and maintain and improve their ability to exercise, especially long-term endurance exercise. Has a positive effect. When evaluating and comparing two or more foods (including sports drinks) containing a certain amount of sugar, it is necessary to consider that sugar molecular weight, molecular structure and other aspects will affect its absorption and transport in the body. The blood glucose response and hormonal response are different. Therefore, comprehensive evaluation indexes such as glycemic index (GI) and glycemic load (GL) are usually required. Sugary foods with a high glycemic index are more likely to enter the bloodstream from the gastrointestinal tract, which causes a larger blood glucose response, while foods with a low glycemic index have the opposite effect; at the same time, with a constant glycemic index, foods with high sugar content have a higher High blood sugar load, food with low sugar content has less blood sugar load [15].

In the case of the same total amount of sugar intake and one-time sugar supplementation before exercise, the low-glycemic index sugar-containing foods decompose and absorb slowly in the body, which can maintain a continuous supply of sugar during long-term exercise, The blood glucose level changes less during exercise, the insulin response is lower, the degree of fat mobilization is higher, it can promote the oxidation of sugar and fat, and improve the efficiency of substance utilization, so it may be more conducive to the maintenance of long-term endurance exercise capacity.

(3) Electrolyte

The human body fluid balance includes two aspects: electrolyte balance and acid-base balance. Adding a small amount of electrolytes such as sodium chloride and potassium chloride to the beverage can theoretically maintain the body's electrolyte balance and improve the taste of the beverage. The content of electrolytes in current sports drinks is mainly based on the osmotic pressure of plasma, and hypotonic, isotonic or hypertonic sports drinks are configured according to different purposes. When sports drink applications were just started, merchants based on the theory that high osmotic pressure can promote the passive transport of substances into cells. Excessive monosaccharides and electrolytes were added to the drink, which caused water absorption to decrease or even aggravated water loss. Big negative impact. Subsequently, businesses began to mix monosaccharides with maltodextrin. In this way, even if the electrolyte content was not reduced to ensure the taste of the beverage, the osmotic pressure of the beverage could be reduced and the sugar content would be sufficient. In addition, there are electrolytes such as sodium citrate, sodium bicarbonate in sports drinks, which are generally strong alkalis and weak acid salts. It can be hydrolyzed in the human body to produce alkaline products to neutralize acidic substances such as lactic acid produced by sports to maintain acidity alkali balance.

(4) Proteins, peptides, amino acids

Protein is the basic material component of muscle. The protein ingested from the outside is decomposed into small molecule peptides and amino acids by the digestive juice, and then absorbed and recombined to participate in protein synthesis and metabolism of the body. During resistance exercise, the body's protein synthesis rate increases, and during medium-intensity long-term endurance exercise, protein synthesis is inhibited, but even if the synthesis rate increases, the increase in the decomposition rate is still higher than the synthesis rate shows negative nitrogen balance, even after exercise. Ingesting a certain amount of protein, small molecule peptides or amino acids can reverse this situation. The reason for this phenomenon is that exercise stimulation and nutritional supplementation can affect the content of cytokines related to the synthesis of cellular material (including proteins) in the body, which results in a series of material synthesis regulation phenomena. Therefore, ingesting sports drinks containing protein, peptides, amino acids and other ingredients is beneficial for muscle protein synthesis and muscle fiber and mitochondria reconstruction, reducing muscle cell damage caused by exercise, and achieving the purpose of promoting recovery and strengthening muscle strength. In addition, intake of protein-containing sports drinks may also affect the body's insulin, glucagon and other hormone levels. Insulin and glucagon levels produced in the body within two hours after intake of a sugar-protein mixed drink or solid food It can be higher than the level when glucose is simply taken in. This is mainly because the amino acids produced by protein breakdown in the body after protein intake can stimulate islet β cells to secrete insulin. At the same time, the intestinal tract can increase sugar, electrolytes. Facilitates absorption, thereby further enhancing the stimulating effect on islet cells.

(5) Vitamins and minerals

The vitamins currently added in sports drinks are mainly B vitamins, folic acid, and vitamin C, and the minerals added are mainly calcium ions, magnesium ions, and the like. B vitamins are involved in cell respiratory metabolism, hematopoietic and other life activities, and play an important role in maintaining the body's growth and development, metabolism, and disease prevention. Vitamin C's antioxidant effect can eliminate free radicals generated by exercise, prevent cell peroxidative damage, and maintain normal cell function. Calcium and magnesium ions can maintain the stability of the nervous system and the expansion and contraction of muscle fibers. When a large amount of body fluids are lost, the amount of calcium and magnesium ions is also increased, and the body is prone to symptoms such as fatigue, blurred consciousness, and convulsions. Athletes have a greater demand for vitamins and minerals than the general population. In long-term endurance sports (especially ultra-long endurance sports for 2 hours or even 4 hours or more), the body cannot get timely dietary supplements, and vitamins and minerals are added. Mineral beverages can temporarily provide corresponding nutritional supplements at this stage, so they have a certain positive effect.

2.3. Timing and Methods of Sports Drink Replenishment

2.3.1. Timing of Replenishing Sports Drinks

The factors that influence glucose response to insulin before exercise are mainly the following five points: first, the time point of sugar supplementation before exercise; second, the amount of sugar supplement; third, the ability of glycogen synthesis after glucose supplement; fourth, insulin response Individual differences; Fifth, the rate of muscle glycogen consumption changes. Insufficient timing of sugar supplementation can lead to the occurrence of hyperinsulinemia, which may be caused by the rapid rise in blood sugar after ingesting sugars, which usually occurs 5 to 15 minutes after ingesting sugars, at which time insulin will rise 4 times, making the blood sugar drop rapidly and hypoglycemia, athletes may appear dizziness, fatigue, blurred consciousness, and even hypoglycemia symptoms such as syncope. High-concentration insulin will inhibit fat oxidation and

increase glycogenolysis in the subsequent period of time, thereby reducing the symptoms of hypoglycemia. Therefore, we should reasonably grasp the timing of supplementing sports drinks, otherwise the effect will be counterproductive.

2.3.2. Replenishment Method and Quantity of Sports Drinks

Isobaric control method: supplement amount is 0.8g / kg · h glucose, 0.4g / kg · h glucose + 0.4g / kg · h protein / amino acid, 1.2g / kg · h glucose + maltodextrin, of which simple glucose Intervention was used as a negative control, and glucose + protein / amino acid and glucose + maltodextrin were equicaloric ratios, and the amount of fluid was replenished at a rate of 3.5ml / kg every 30 minutes for 270 minutes.

2.4. Physiological and Biochemical Indexes

2.4.1. The Role of Physiological and Biochemical Indicators

(1) Heart rate

In athletes' sports training, it is also a reflection of the size of the load they are exposed to. The reason is that as the intensity of exercise increases, human adrenaline secretion increases, making sympathetic nerves dominate, which will increase the rate. Maximum number of times. Therefore, detecting the maximum heart rate of athletes is of great significance to the development of athletes' athletic ability.

(2) Blood lactic acid

When the athlete is calm, the blood lactic acid concentration is constant, and during the exercise, the blood lactic acid concentration will change dramatically due to the difference in exercise intensity, because the blood lactic acid concentration is related to the functional system, and blood lactic acid can be anaerobically digested by muscle glycogen. It generates energy, which is the product of ADP when it is synthesized again into ATP. It can provide energy for high-energy phosphoric acid, provide high-intensity energy in line with exercise, and is also a substrate for aerobic metabolism. The concentration of lactic acid is below 2mmol. When the exercise intensity is large, it will rise to more than 18mmol in a short time. Therefore, blood lactic acid can effectively evaluate the training intensity of athletes.

(3) PRE

The subjective sensory fatigue measurement table can accurately record the occurrence of training fatigue in each period of training. Because RPE is the main sensory fatigue, it is not a single physiological and biochemical index, but a composite result that affects the athlete's subjective feeling.

2.4.2. Significance of Physiological and Biochemical Indexes on Football

There is an inseparable relationship between competitive sports and human body's energy metabolism. Energy metabolism can be divided into two main types: aerobic metabolism and anaerobic metabolism. According to the sports characteristics of football, football belongs to a mixed metabolic process of anaerobic and aerobic metabolism. Some data show that 30% -40% of anaerobic metabolism time is in football and 60% -70% of aerobic metabolism is in During the intermittent period, anaerobic metabolism includes a phosphate energy supply system and a glycolysis energy supply system. Phosgenogen is powered by ATP-CP for a period of 6-8 seconds, and the glycolysis energy supply time is about 60 seconds. If the exercise time exceeds 90 seconds, the energy supply mode is mainly aerobic metabolism. Therefore, according to the obvious

physiological and biochemical indicators reflected by the way of energy supply of football, such as blood lactate, creatine kinase, heart rate, subjective feeling fatigue, these indicators can reflect the physical functions of athletes during football training effective monitoring.

3. Experiments

3.1. Data Collection

In this paper, 8 mice were selected as experimental subjects, including 4 male mice and 4 male and female mice. The eight mice were all adult mice. The average weight is about 22 grams. The experiments in this article were fed according to the national standard rodent feed. During the life, the room temperature was maintained at 20-23 °C, the relative humidity was 44% -45%, and natural light was used. The next day, smoked vinegar was used for air disinfection.

3.2. Experimental Methods

3.2.1. Experimental Process

This experiment is a single-blind self-controlled trial with a test cycle of four weeks. Each mouse is tested for four weeks. Each mouse will continue to be supplemented with a training drink during the week of training. The test was repeated 7 days after the end of a week of training, in order to buffer the effects of each supplement. Change the method of beverage replenishment when testing again. The H training drink supplements in the experiment were supplemented with 12ml each time in 20min and 8-10ml each time in 15 minutes. Drinks were randomly added. During training, the heart rate, blood lactic acid, and blood glucose of the mice were recorded. Finally, after the training, the mice were continuously tested for their special technical ability. The next day after training, finger blood was taken for creatine kinase testing.

3.2.2. Specific Test Methods

Before training: Test the heart rate, blood lactic acid, creatine kinase ck, and response time of mice before exercise training. The first training drink was replenished 15 minutes before training.

During training: Sports drink replenishment every 15-20 minutes. After training, measure the heart rate immediately after exercise, creatine kinase ck, blood lactate, recover the heart rate and blood lactate value after 3 minutes of rest, and the heart rate and blood lactate value after 5 minutes of recovery.

After training: Measure the response time of mice immediately after training, and perform a special technical ability test on mice. And in the early morning of the next day, the mouse finger blood was taken to measure creatine kinase.

3.3. Test Indicators and Methods

(1) ck

All mice were tested for creatine kinase three times when they were calm before training, after training and when they were calm before training the next morning, and analyzed with a semi-automatic biochemical analyzer MD-100.

(2) Bla

The mice used to test the blood lactic acid concentration at the four time points immediately after the exercise load intensity at calm time before training and recovered 3 minutes and 5 minutes were

German-made EKF-C-LINEGP.

(3) Heart rate

All tested mice wore the training computer polarS400 10 minutes before exercise.

3.4. Statistics

The $\bar{X} \pm SD$ data is expressed by the mean plus or minus the standard deviation. Statistical analysis is performed with spssforwindow 19.0. Paired sample T test is performed. $P < 0.05$ indicates a significant difference, and $p < 0.01$ indicates a very significant difference. Blood lactate was tested with EKF-C-LINEGP, CK creatine kinase was tested with a semi-automatic biochemical analyzer MD-100, and heart rate was tested with polarS400.

4. Discussion

4.1. Changes in Blood Lactic Acid and Creatine Kinase under Different Supplement Beverage Methods

4.1.1. Changes of Blood Lactic Acid under Different Supplement Beverage Methods

Compared with white water, supplementary sports drinks have significantly improved the ability of athletes to flush acid. The reason may be that the mice have more sugar reserves before sports training, and the lactic acid recovery from the lactic acid peak after 3 minutes of training to 5 minutes After the gradual decline, there is a significant difference between white water supplement and sports water supplementation method once every 20 minutes, and there is also a significant difference between the random supplement drink and white water, but the 15 minute group is not. The reason for analysis may be that there are 2 small The time delay in the appearance of the rat caused the data to be inaccurate. But on the whole, it shows that the supplement drink is better than white water in eliminating blood lactic acid. The blood lactic acid BLA takes 1 to 2 minutes from creatine to blood lactic acid, so the blood lactate value immediately after training is not the highest value, so the recovery with the largest decrease is also pushed back to the recovery value of 5 minutes. The changes of blood lactic acid under different supplementary beverage methods are shown in Table 1 and Figure 1.

Table 1. Changes in blood lactic acid under different supplementary beverage methods

	water	15min	20min	random
Back-front	6.5	7.2	8.1	6.4
3 minutes-ago	7	7.8	8.6	7
5 minutes-ago	-0.4	-0.7	-1.6	-1.1

As shown in Table 1 and Figure 1, when mice were supplemented with white water, a sports drink every 15 minutes, a sports drink every 20 minutes, and a random sports drink supplement, the blood lactate value was reduced immediately after training minus the calm blood lactate value before training. The results of the paired sample T test, in which the effect of supplementation only once every 20 minutes on the difference between the value immediately after training and the calmness value is different from the effect of random supplementary sports drinks, and the lactic acid value and calmness value are restored in the third minute after exercise. There is no significant difference in the difference. There is a significant difference between the random supplement of sports drinks and white water in the difference between the lactic acid recovery value of the fifth

minute and the value of the lactic acid recovery of the third minute. There are significant differences.

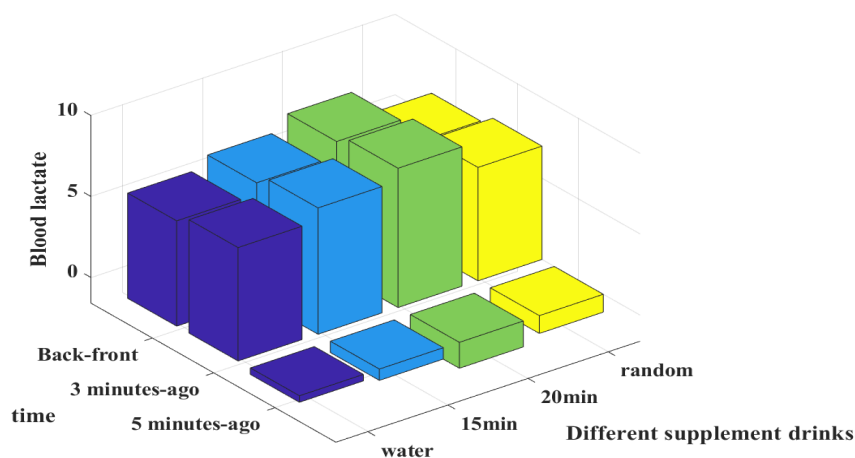


Figure 1. Changes in blood lactic acid under different supplementary beverage methods

4.1.2. Changes of Creatine Kinase under Different Supplement Beverage Methods

There is no significant difference between the creatine kinase value immediately after training and the calmness value before training. The reason may be that football sports are more serious for muscle tension injury. The creatine kinase value has increased significantly after training, whether it is supplemented with white water or drink. The creatine kinase value tested the next morning was compared with the value before training. The 20-minute supplement method was significantly different from white water, and the 20-minute method was worth comparing with the calm value on the second day and immediately after training. There is a significant difference with white water, indicating that this method is more conducive to recovery after muscle injury. However, because CK creatine kinase has its own fatigue and muscle damage in mice, this is related to the previous training backlog, so we cannot judge the recovery effect solely by looking at the value of creatine kinase. The changes of creatine kinase under different supplement beverage methods are shown in Table 2 and Figure 2.

Table 2. Changes of creatine kinase in different supplement beverage methods

	water	15min	20min	random
Back-front	209	185	18	90
3 minutes-ago	211	25	18	103
5 minutes-ago	239	25	18	103

As shown in Figure 2, when the mice were supplemented with white water, a sports drink every 15 minutes, a sports drink every 20 minutes, and a random sports drink supplement, the CK creatine kinase value was reduced the morning calm value the next day after training, and the next day The early morning value minus the calm value on the first day, and the early morning value minus the value immediately after training. After processing the paired sample T test through spss, it was found that there was no significant difference in the value of creatine kinase immediately after training minus the quiet value before training. On the contrary, the creatine kinase value in the early morning of the second day and the calmness value before the first day of training were significantly different from the ck value of the white water supplement method in a 20-minute supplementary method, and at the same time in the next morning and immediately after training, The 20-minute

supplementation method for the difference in creatine kinase value is also significantly different from white water supplementation [16].

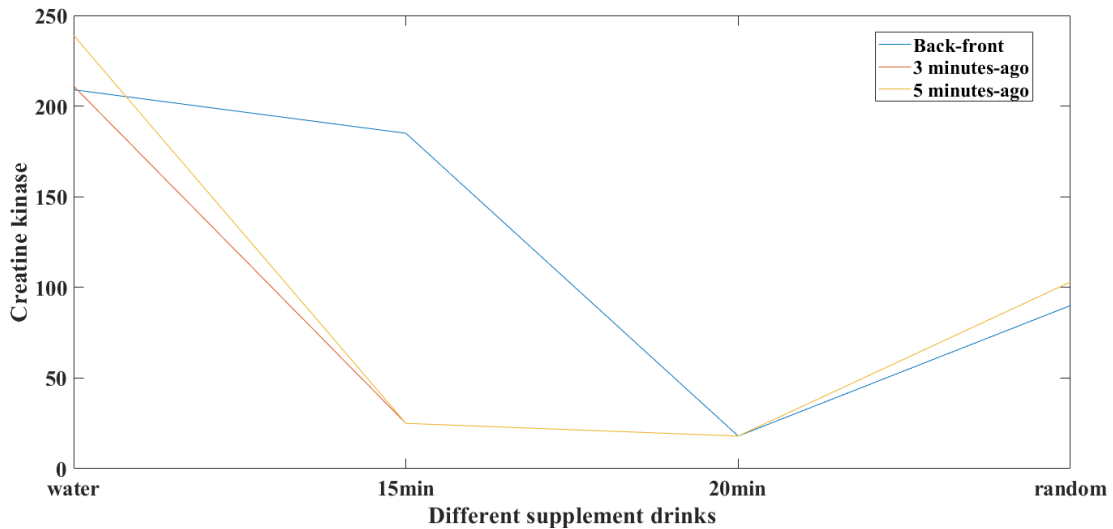


Figure 2. Changes in creatine kinase under different supplement beverage methods

4.2. Heart Rate Changes and Case Analysis under Different Supplement Beverage Methods

4.2.1. Change of Heart Rate under Different Supplement Beverage Methods

By comparing the difference between the heart rate immediately after training and the recovery of heart rate at 3 minutes and 5 minutes after training, there is no significant difference in the comparison of different methods of supplement drinks and white water. The reason may be that the increase in heart rate is mainly due to the secretion of adrenaline makes the sympathetic nerve dominate. The components of sports drinks are mainly supplemented with ions and sugar, which will not have a major impact on the recovery of heart rate. The heart rate is mainly the recovery of the heart rate in the 3rd minute. Because there is an interval between each ball in football, but the intensity of each ball is very high, so the heart rate will greatly increase in a short period of time, recovering immediately after exercise to 3 minutes. The value decreased sharply, and it was not obvious when the value was restored within 5 minutes. Changes in heart rate under different supplementary beverage methods are shown in Figure 3.

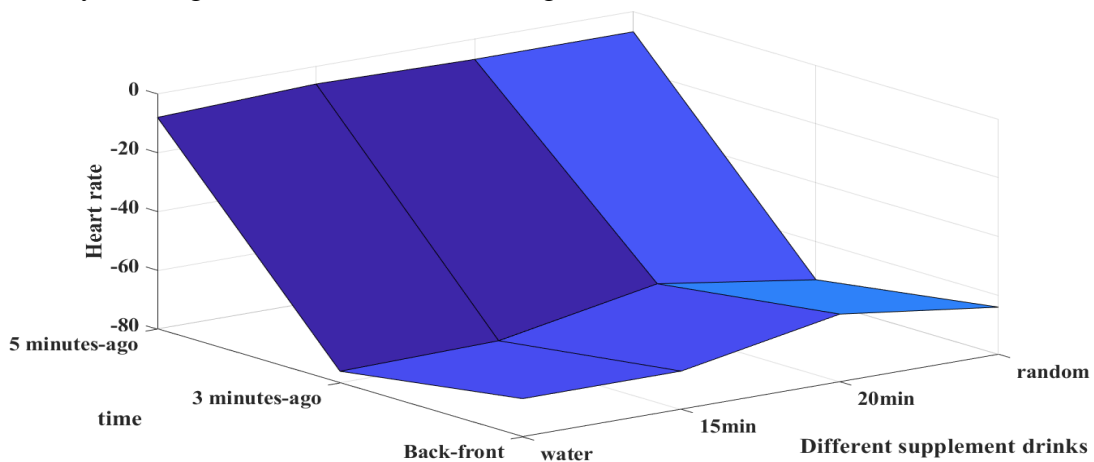


Figure 3. Changes in heart rate under different supplementary beverage methods

As shown in Figure 3, when the mice were supplemented with white water, a sports drink every 15 minutes, a sports drink every 20 minutes, and a random sports drink supplement, the difference between the HR heart rate immediately after exercise and the heart rate recovered 3 minutes after exercise. The difference between the recovered heart rate in minutes and immediately after training, and the difference between the recovered heart rate in 5 minutes and 3 minutes after training. There was no significant difference after treatment of paired sample T test by spss.

4.2.2. Case Analysis

Taking mouse No. 1 as an example, several values of blood lactic acid creatine kinase and heart rate of mouse No. 1 were supplemented with white water, a 15-minute drink, and a 20-minute sports drink. Sports blood was randomly supplemented with sports drinks. After 3 minutes to 5 minutes, it is 15 minutes. The effect of Park Charging can be obvious. The recovery value of creatine kinase on the second day is compared with that before and after training. It is also a good 15 minute supplement. The curve is gentle, which indicates that the athlete is more suitable for this supplement. Ways to analyze the reasons. The athlete No. 1 has good muscle elasticity, strong bouncing power, excellent explosive power, and outstanding softness, so this athlete has a large fluid loss. Because of the large muscle flexion and extension, the value of creatine kinase is slightly higher than other mice. It should be replenished more frequently and in small quantities. Case analysis is shown in Table 3 and Figure 4.

Table 3. Case analysis

		water	15min	20min	random
bla	immediately	1	1	1	1
	3min	9	10	11	11
	5min	10	12	14	11.5
ck	immediately	350	225	225	250
	3min	500	230	250	270
	5min	300	200	200	230
hr	immediately	185	180	185	185
	3min	140	120	130	140
	5min	125	110	120	130

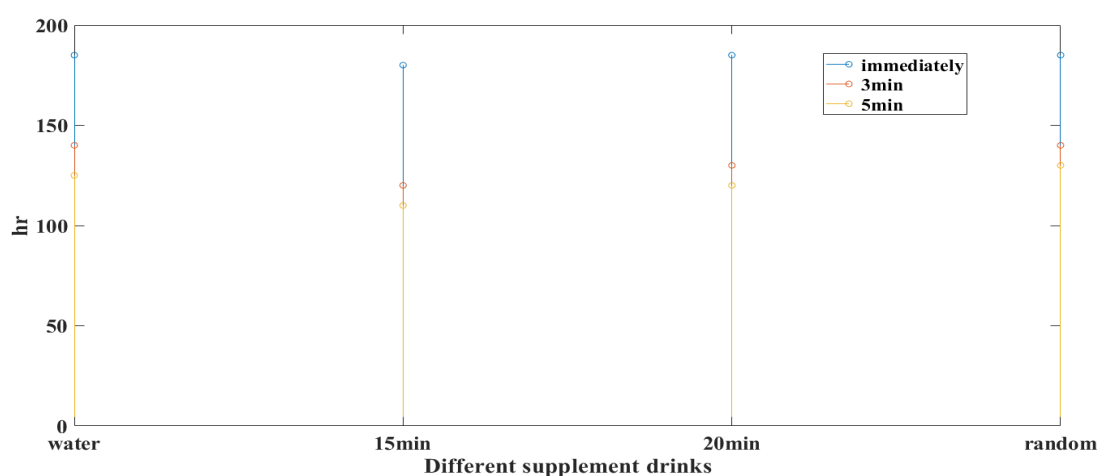


Figure 4. Case analysis

As shown in Table 3 and Figure 4, when the three values of bla, ck, and hr of mouse No. 1 were supplemented with white water, a sports drink once every 15 minutes, a sports drink once every 20 minutes, and a sports drink supplement at random, The blood lactate elimination rate of 5 minutes and 5 minutes are all more effective when supplemented with a sports drink every 15 minutes. The recovery rate of CK creatine kinase and the rate of recovery are also 15 minutes. The effect of supplemented sports drink is better. This means that this mouse is more suitable for this supplement.

5. Conclusion

(1) This article proves through experiments that hairball training is strong, fast-paced, and consumes a lot. It is recommended that sports drinks be added for glycogen storage in advance of exercise. During training, because athletes lose a lot of sweat, it is easy to lose Zhonggang ions. Deformation of athletes' technical movements should be supplemented with ion-rich sports drinks. Compared with simple and single supplementary white water as a supplemental beverage, the advantages of sports drinks are obvious.

(2) This article proves through experiments that, although there are large differences among athletes, each method has different effects on individuals, so it is necessary to formulate a corresponding sports drink supplement plan according to the individual's physical fitness. But overall, the effect of regular sports drink supplementation is significantly stronger than random supplementation based on athlete drinks.

(3) This article proves through experiments that the method of supplementing once every 15 minutes is compared with the method of supplementing once every 20 minutes. The 15-minute supplement method is more suitable for athletes with high white muscle fiber and high speed and explosive power, and the 20-minute supplement method is more suitable for red. Endurance athletes with a high proportion of muscle fibers.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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