

Research Article

Research on Intervention Measures of Sports Nutrition for Athletes' Fatigue Recovery

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Abstract: This study analyzes the necessity of sports nutrition intervention for the recovery of the athletes' fatigue, discussing the intervention measures of sports nutrition for athletes' fatigue recovery with the help of the interpretation of sports fatigue. The nutrition supplement for sports fatigue which is an effective method to alleviate the symptoms, promote the recovery and guarantee the training.

Keywords: Fatigue recovery, nutrition intervention, nutrition supplement

INTRODUCTION

Physical fitness can effectively enhance the physical quality and promote physical and mental health. However, during the process of having sports, human can consume a large amount of nutrients, accumulate the material of metabolism, which can make the sports ability of human body declined, thus produce sports fatigue (He, 2003). Therefore, during the period of having physical fitness, at the same time, we also pay attention to the supplement of nutrition, according to the different sport items having different effect on the metabolism of the body and based on the different needs of nutrition under different conditions, plan out a scientific and reasonable nutrition supplement scheme, which can help the body to be in a good condition, so as to improve the sports ability of athletes.

MATERIALS AND METHODS

The interpretation of sports fatigue: Karpovich (1979), defined sports fatigue as: "Fatigue is a phenomenon that the job itself causes the working capacity reduced." The textbooks for national sports college Science of Sports Physiology defined fatigue as: "A phenomenon because of the activities that make the working ability and body function temporarily reduced." In 1982, at the Fifth International Conference on Sport Biochemistry, fatigue was defined as: "The physiological process of the organism cannot continue its functions in a particular level and each organ cannot maintain the scheduled exercise intensity." Based on the above definitions, sports fatigue can be understood as: sports fatigue is a phenomenon caused by the movement of the sports abilities and physical engineering that are temporarily declined. That is to say, the cause of sports fatigue is the movement, not the disease, drugs, environmental factors and nutritional factors, etc.

moreover, the decrease of sports ability is temporary, after having a rest and recuperation, it can be recovered, which is different from excessive training and some diseases.

The generation mechanism of sports fatigue: According to the different body parts of fatigue, sports fatigue can be divided into physiological sports fatigue and psychological sports fatigue (Fig. 1).

From a practical point of view, the reasons that caused physiological sports fatigue can be included:

Anaerobic exercises: The anaerobic exercise fatigue mainly refers to the emergence of fatigue in a short time after the strenuous exercises. Because the players complete the sports exercises in holding the breath or breathing one or two times, so the body's physiological and biochemical processes are carried out under the anaerobic conditions, resulting in many tissues, especially muscle lactate accumulation, causing fatigue.

Aerobic exercises (Zhou, 2002): The exercise is performed with smaller intensity in a longer duration time, which is also known as aerobic exercise, namely, the motion is completed under the condition of the demand of oxygen basically enough. Because of the bad effects of the external condition or the time of the exercising duration, which resulted in decreasing the reservation of body's energy, as well as the shortage of energy supply, being forced to slow down the speed greatly or terminate the motion.

The body's coordination function is decreased: The fatigue with decreased coordination function is mainly caused by long time static posture, which is a fatigue with the decreased nervous system or muscle coordination function.

The reasons that caused sports psychological fatigue can be included:

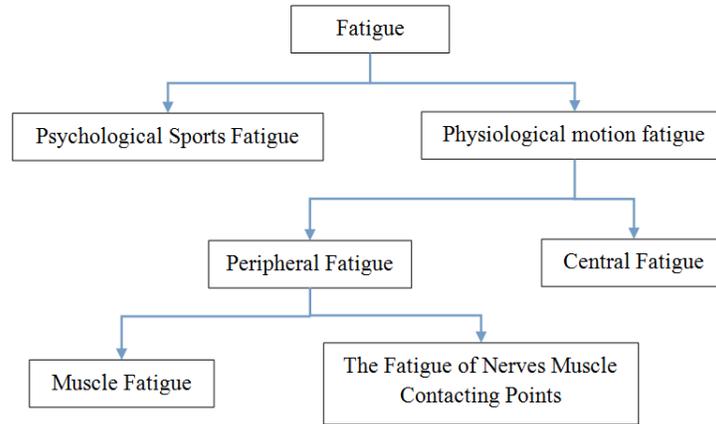


Fig. 1: The classification of fatigue

The complexity and tension of sports training and competition: During the period of the athletes have training and competition, the main organs of the body are bearing high load and the emotional states of the athletes' are more nervous from the beginning to the end, which highly focused on the activities. At the same time, the perception, memory, thinking of the athletes' are in a highly nervous working state, with various strong stimulations, consuming a great deal of human body's physiological energy and neural energy, with the depletion of the energy, the psychological fatigue is occurred.

The motivation of the training is lost: Sports psychological fatigue is more easily to make the players lose the training motivation than physical fatigue, in a specific environment, some factors that can lead to the loss of the training motivation, such as the frustration of the competition, the loss of the training goal, the repeated criticism and rebuke from the coach and so on, which often cause the sports psychological fatigue.

The monotonicity of sports training: Now, there may be a considerable part of the coaches have the thought that more training is better, who followed by the "stimulus-response" theory, they thought if one hour's training is effective, then two hours' training is better than one hour's training, a few hours' training will be much better. This kind of dull training is bound to cause the players to be tired and disgusted, which must lead to the psychological fatigue.

The necessity of sports nutrition intervention for athlete's fatigue recovery: With the development of sports competition is increasingly intense, when the well trained athletes were with gathered together, the differences and boundaries between success and failure are smaller and smaller, the difference is only in a few tenths of a second, a few centimeters and even in a few hundredths of a second, or a few tenths centimeters, at

this time, paying attention to the detail often becomes the key to success. In 2000, at the Conference of Scientific Papers of Asian Games, it firstly took sports nutrition as a specially important reporting content, sports nutrition has become one of the important branches of sports science, which has made considerable progress in the theory and practice, playing more and more important role in sports training and fitness exercises. On June, 2003, at the International Olympic Committee Conference held in Lausanne, the relevant international organizations that attended the meeting all agreed that the preparatory nutrition working organization of the Medical Commission of the International Olympic Committee prepare and organize to write a nutrition guide book to support and guide the athlete's scientific and reasonable diet. At the same time, the domestic research on sports and nutrition was actively carried on, such as Zheng Sui, Ping Xiaochun concluded that the reasonable feeding time for athletes, as well as the dietary structure had played an important role in improving the training effect, improving sports abilities and preventing excessive training, etc. They stressed, reasonable dietary with nutrition was the material basis for the athletes to improve sports level, making scientific and rational use of nutrients could help the athletes to improve the physical and mental health, so as to improve sports abilities. Numerous studies confirmed that, in the high intensive sports training or competition, if the athletes can maintain adequate intake of carbohydrate, it can play a very important role in maintaining the body's sports abilities and sports level. He Jianwei, Lu Wei and other people concluded that the appropriate supplement of vitamins can not only raise the training effect, prevent the disease of movement disorders, but also can make the body in fatigue get sufficient rest and recovery. For example, vitamin A can improve the growth of the bone and turn the gristles into bones, the most important is, vitamin A can maintain the visual retinal photoreceptor nuclei and the

cornea, therefore, sports items that have special requirements or higher requirements on vision, such as the shooting athletes must ensure have adequate vitamin A supplement. Vitamin B can promote the utilization of glucose and improve sports abilities, etc. All this shows that the related researches on athlete's nutrition is of great significance and plays a very important role in the athletic sports field (Zhou, 2008).

RESULTS AND DISCUSSION

The intervention measures of sports nutrition for athlete's fatigue recovery: Reasonable nutrition intervention can not only become the material basis for the athletes to keep good conditions, but also can have obvious effect on the athletes' body's composition, functional state, sports abilities, physical recovery after exercises and the prevention of the sports diseases, etc.

Heat quantity should be balanced, the diet of the athlete's should ensure the heat demand of the daily training, competition and all kinds of activities, who also should pay attention to maintaining the balance between the in taking and consumption. Studies have shown that exercises with small or moderate intensity can effectively promote the appetite, while after a large amount of exercises, appetite is often suppressed, therefore, we must pay great attention to the athlete's energy supply after a large amount of exercises.

The diversification of food, the balance of the diet that should be supplied including three big energy substances (sugar, fat, protein), which should combine different training periods and different sports items, taking different collocation, at the same time, ensuring enough vitamins, minerals and water supply (Griffith *et al.*, 2004). After the strenuous exercise or excessive exercises, it will add the body's acidic substances, in order to maintain the acid-base balance; people should increase the reserve of alkali, such as eating more vegetables, fruits and other basic foods. When the heat supply is insufficient or excessive, the balance of supply and demand can be adjusted by the staple food, grease or sweets to achieve the needed heat. After a long time of sports fatigue, the first consideration is to maintain the energy supplement. Sugar is the best supplement material, since sugar is easily to be digested and absorbed by the body, it can be used and stored by the relevant parts of the body as soon as possible. Relatively speaking, the supplement of fat is minor, the adequate amount of vitamin supplement can improve and recover the body's metabolism function, which is conducive to the nervous system and the stability of internal environment. During the period of the

movement, there are lots of sweats and drainages, therefore, the supplement of inorganic salt is also very important, but it can't supply too much once a time, otherwise it will affect the digestive function as well as the appetite.

The reasonable diet system should be including the allocation of diet, dinning time and frequency, the players should follow: regular meals, reasonable diet, without eating excitant food and drinking strong alcohol. Studies have shown that increasing the number of meals properly is beneficial for the health of athletes', meanwhile it can improve the working efficiency. Therefore, in addition to the three meals daily, it is better to increase deserts one to two times, which is especially important for young athletes who are in the growth and development with large heat energy consumption. Dinning time and training, game time should maintain a certain interval, especially three meals of a day, namely, breakfast, lunch and supper, dinner. In general, after the exercises, over 30 min rest it is better to have meal, after the strenuous exercises or a large amount of exercise, it needs more than 45 min to have rest than have meal. After eating, athletes need a 1½ to 2 h of rest to go on exercising.

It should be banned resolutely to have a tensed or long time competition and training without dinning, adding meals cannot emphasize the intervals of time, but the food must be easily digested and absorbed, which cannot increase the burden of the stomach. The allocation of the heat as well as the allocation of the three meals a day should be determined by the athletes combined with the specific activities of a day. In principle, the total amount of the meal before exercising should not too much, which should be easily digested, contained with low fat and low crude fiber content, the total amount of the meal after exercising may be much more appropriately, but if it is dinner, it cannot be too much, choosing food easily to be digested with small irritant. Breakfast should add more adequate protein and vitamins, which is conducive to keep physiological function at a high level, while dinner should not eat too much food containing fat and protein. The allocation of heat from three meals a day is as shown in Table 1.

Reasonable nutrition supplement, if athletes can achieve a balanced diet with good quality, there is no need to increase the additional supplements, during the period of the prevention of nutritional deficiencies, it also needs to pay attention to the adverse effect brought by the excessive nutrition.

Table 1: The allocation of heat for each meal /%

	Breakfast	Lunch	Dinner	Picnic
I	30-35 (sports movement)	35-40	30-35	-
II	35-40	30-35 (sports movement)	30-35	-
III	30-35	35-40	20-25 (sports movement)	10-15

CONCLUSION

The elimination of athletes' fatigue and the nutrition intervention measures is a different but related continuous process, athletes must clearly recognize the relationship and the importance of the two (Axleson and Brinberg, 1989). Combing the elimination of fatigue with sports nutrition intervention organically in training and competition, rationally making use of physical recovery measures, scientifically selecting nutrition and sports nutrition measures can make athletes eliminate fatigue as soon as possible, who can be fully restored and improve the training effects, so as to create outstanding athletic performance.

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