Research Article

Study on Athletes’ Food Nutrition Supplement Scheme during Tennis Competition

Qiang Li
Northwest University, Xi’an, China

Abstract: This study offers a series of scientific, reasonable, simple and pragmatic plan of nutrition meal, which tallies with the characteristics of motor projects, researching the dining condition and nutritious situation in the certain period of training, in order to provide reference for scientifically tennis training, teaching and exercising. Stamina is the base of motor skill, in which nutritious supplement is the core. Reasonable nutritious supplement plays a key role in the training effect and race scores of national short track speed skating. According to the judgment of energy metabolism, organism state of tennis and the features of energy supply system in tennis competition.

Keywords: Energy supply, nutrition supplement, tennis training

INTRODUCTION

Nnis is a sort of sports program which needs accurate motion, delicate skills, fierce rivalry and highly mental ability and stamina. Tennis becomes more and more popular in the 21st century with highly-developed level and more fierce competition in the ground, all that means tennis develops toward to strength and speed style. China’s tennis movement has improved widely in recent years, with competition level largely progressing. Li Ting and Sun Tiantian have won the women's doubles match in Athen’s Olympic Games, hitting the record historically. As for Zheng Jie, Yan Zi and Peng Shuai, who are single players, have already won the good scores in international tennis matches, from which the hope of China’s tennis can be observed (Bishop et al., 2001). Because the competition program consisting of continuously short-time paroxysmal motions allows short time rest after every driving, the athletes’ strength will be highly expected. Meanwhile, tennis need diversified sprint motions, which means invoking and breaking strength. From the view of trend, physical condition mainly decides the match result, when their tactics reaching to a certain level. All of these, can't be divided from athletes’ physical strength improvement.

MATERIALS AND METHODS

Energy metabolism characteristics and the movement function state of tennis sport:

Energy metabolism characteristics of tennis sport:

Tennis is a mixture of aerobic and anaerobic exercise (Fig. 1). As for tennis competitions, the game time is uncertain. Maybe the game will last for less an hour. However, sometimes, the competition will last for 3 or four hours when two sides are well-matched in strength. So in the match, the fighting is intensively fierce. A research conducted by British investigators Alan Pearson and Karl Cooke found that the average time of continuous fight for every ball is about 10.2 sec and that ratio of hitting time and non-hitting time in the game is 1: 1.7. At this time, the energy system which can completes each brief action needs neither the oxygen environment nor Oxygen (Walsh et al., 1998). Nevertheless, with a game often lasting for 3-4 h, it is essential for an athlete to has a super aerobic energy system, which can help synthetize ATP and CP at each internal. Besides, sugar is an important cell fuel in an intense exercise. The longer athletes exercise, the greater the proportion of fat oxidation for energy will
become. Glycolysis can maintain within 2 min, which is
unnecessary for tennis sport. Even if a small amount of
lactic acid is generated, it will be re-used during
interrupted periods, not causing accumulation of lactic
acid (Castell and Newsholme, 1997).

Functional state of tennis: Tennis movement is
characterized by strength, endurance, agility, speed and
strength quality.

The key to win a tennis movement is the technique
of receiving and serving, whose basis is athletes’
explosive force. For instance, serving lifts up a high
standard for athletes on their wrist strength and back
muscle strength. In addition, stroking needs athletes’
powerful waist and shoulder muscle strength. Therefore, explosive force is the key to win a game
(Rohde et al., 1998).

Tennis movement is a typical endurance project
with its long duration and moderate strength.

Tennis movement is an against-project changing
with different forms of movement, in which the nature
and intensity of action are bound to have a sharp or
sudden change. Hence, athletes need high sensitive
quality to make a quick judgment of the situation so as
to complete the action promptly. The strength quality is
the foundation and guarantee of athletes’ mastering
specific techniques. What’s more, strength training
which can ensure the effectiveness of sport organs is
the basis for athlete's technology, tactics and physical
training. Therefore, strength training, like physical
training, is characterized by systematicness, planning
and continuity (Parry-Billings et al., 1992). Foreigners
calling it strength and conditional, which refers to
special power system and its related movement quality,
shows its important position in the visible physical
strength. In a word, strength and conditional is a special
power system and its related movement quality that can
help athletes to win a high-level competition. As shown
in Table 1.

RESULTS AND DISCUSSION

Nutritional supplement principles: Nutritional
supplement principles mainly include time-choosing,
less food and more meals, high nutrient, moderate fruit
and vegetable, supplement of nutrient, adjustment of
nutrient, in which choosing time is important because
non-eating in time or eating at immoderate time is
unnecessary for stomach spleen, having a bad influence
on appetite and digest function; athletes’ strength will

<table>
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<th>Division basis</th>
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<tr>
<td>Size of load</td>
<td>Maximal force basic forces, basic force, rapid strength, strength endurance</td>
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Table 1: Traditional classification of power quality

It is essential for athletes to reserve glycogen,
alkali, vitamin before racing about 1 or 2 weeks. With
the decreasing of the amount of exercise, it is a must for
athletes to adjust food intake in case of gaining weight.

Athletes can supplement sugary foods, including rice,
noodles and so on, about 500 g each day. If necessary,
eat little fried food and drink enough water. Meanwhile,
athletes may choose some high protein fishes and egg
food about 200 g or so every day. It is better to eat
much fruit and vegetable to meet the need of
supplementing enough vitamin and inorganic salt.

Before 2 weeks of the race, athletes shall pay attention
to enough intakes of vitamin A and B and which can
enhance muscle glycogen reserves and add up to 150 to
250 mmol/kg wet muscle with the combination of diet
operation and training before racing. Apart from
routine, you can improve the way to fill muscle
glycogen 10 days in advanced. Also, it is sensible to
take in nutrient food 5 days ahead of time and high
glycogen food after 5 days to increase the hepatic
glycogen reverse. What is important, it is necessary to
take in enough vitamin and inorganic salt instead of
excessive protein and fat. What’s more, ample intake of
carbohydrate, high activity protein, special amino acid and antioxidant is rational. For example, bioflavonoids can play an important role in enhancing Immune ability. Besides, in the course of high intensive training, glutamine is much more helpful to enhance athletes’ sports ability and improve their performance.

**Nutritional supplements during the racing:** Because the final champion’ come-out needs multiple rounds in a project, it is necessary for athletes to make a physical recovery in between each round. If the pause time of the game is less than 30 min, they need to supplement liquid rich in carbohydrates such as sports drinks, fruit juice and so on. With an internal between 30 and 60 min, nutrition like bread coated with honey or jam and energy bars are necessary. If the internal time is between 1 and 2 h, low-fat sauce pasta, steamed rice, noodles, sandwich or rolls can be taken into consideration. Those liquid or semi-liquid food containing monosaccharide, disaccharide, polysaccharide, low carbohydrates, a certain amount of whey protein, creatine, glutamine and a variety of trace elements and vitamin are easily absorbed. Besides, the supplementation of creatine can improve and enhance the function of skeletal muscle mitochondria, promoting muscle glycogen reserves, increasing muscle size and strength and improving the sprint ability of short track athletes in the match. The selection of pure creatine, creatine phosphate and creatine pyruvate, combing with enough water and sugar, can intensify the effect of creatine, relieving muscle fatigue appearing in the game effectively and maintaining athletes’ sports ability.

**Nutritional supplements after the game:** With tennis players general continuous tense competitions causing great energy consumption of the body, reasonable nutrition supplements in time can help eliminate fatigue and restore physical strength. Sugar supplement after the game is an effective means to eliminate sports fatigue and promote physical recovery, enhancing body energy reserves. Taking 100-150 g glucose immediately or supplementing sugar-rich food and beverage after a high-strength match can restore athletes’ energy and promote the liver glycogen reserves so as to restore blood glucose levels and reduce the blood lactic acid content. Moreover, protein supplements like vegetable protein powder and whey protein help athletes to make a quick recovery after a match. Additionally, the intake of bioactive peptides plays an indispensable role in decreasing muscle protein degradation, promoting the rapid restoration of muscle, participating in the regulation of physiological activities of the human body, removing oxygen free radicals in the body, increasing the oxygen-carrying capacity of red blood cells and eliminating athletes’ fatigue.

**CONCLUSION**

A reasonable nutrition supplement can improve physical fitness and sports performance of tennis players. Advisable principles must be followed in the process of nutritional supplements, which can help athletes’ physical recovery. Therefore, good nutrition means good nutrient reserves, better energy metabolism, wonderful performance and normal mental conditions, which help athletes to build up a good physical fitness and get satisfactory grades. Thus, it is clear that a deep research on nutritional supplements of tennis athletes plays an important role in athletes’ excellent performance.

**REFERENCES**


