

Research Article

Research of the Influence of Rational Use of Nutritional Foods on Different Track and Field Items

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Abstract: Comprehend the importance of using different nutritional foods for different track and field items, so as to improve the competition ability and overall quality of track and field athletes in practical training in a better way. Mainly the method of literature reading and sorting, questionnaire survey and analysis summary are adopted. Investigate the using status of nutritional foods for different track and field items, analyze existing problems combining pertinent literature and summarize the influence of rational use of nutritional foods on different track and field items. Currently, use of nutritional foods for track and field athletes is rational. Physical quality of track and field athletes can only be improved by absorbing more nutritional dairy foods, as well as nutritional fruits and vegetables.

Keywords: Different items, influence study, nutritional foods, rational use, track and field sports

INTRODUCTION

With the rapid development of economic level, constant improvement of living standard, as well as more and more importance attached to sports by the state, sports nutrition food is developed quickly (Nakavoua *et al.*, 2013). Sports nutrition food is a special food. In fact, it is prepared especially for athletes, extracted and processed from natural food or artificial food as the same with other nutritional foods. As one type of athletes, compared with other athletes, requirement on physical quality of track and field athletes is higher. In the process of training and competition, more physical strength is required to be consumed. Moreover, body activities such as physiological activity and metabolic activity, etc. occurred during exercises is required to be supported by proper and rational nutritional intake. Nutritional foods of track and field athletes shall be scientific and rational; under strict control; not only their weight shall be controlled in the appropriate scope, but their athletic ability improved, so as to assure to strengthen fitness, improve physical fitness and improve exercise capacity and effect. Since there are a number of track and field items and each item has different requirement on physical quality of athletes, sports nutrition food shall not be treated as the same. It can only achieve better effect when specifically and scientifically absorbed and rationally used (Lu, 2005). In the study shows, currently, use of nutritional foods for track and field athletes is rational. Physical quality of track and field athletes can only be improved by absorbing more nutritional dairy foods, as well as nutritional fruits and vegetables.

MATERIALS AND METHODS

Investigation on the using status of nutritional foods of different track and field items: Objects selected by the investigation are track and field athletes on campus. As an important constitution of track and field athletes in our country, reasonable diet situation of university track and field athletes reflects the integral level of track and field athletes in our country to some extent, with representative significance (Yu and Sun, 2012). There are totally 1270 athletes in a sport institute, including 780 male athletes and 490 athletes, with average age of 19.3 ± 2.8 . In this investigation, 210 track and field athletes are drawn for questionnaire survey, including 120 male track and field athletes and 90 female track and field athletes. It is the self-designed questionnaire. The content of the questionnaire is mainly fifteen foods including vegetables and fruits, staple food, beans, dairy products, meat and so on. Intake condition will be investigated by means of review 24 h a day (Zhao *et al.*, 2000). Intake condition of various nutrient elements and calories will be calculated and analyzed in terms of the diet composition table. In order to assure the credibility and reliability of survey data, 10 investigators are trained in this investigation, each in charge of the investigation of 21 track and field athletes. And related software is adopted to carry out the data processing. Diet and nutrient status of male and female athletes are compared in Table 1.

The table indicates that, intake of cereal and meat by male athletes everyday is relatively higher, while intake of vegetables, melons and fruits by female

Table 1: Analytical table of everyday nutritional diet result of 210 athletes

Nutritional food category (g)	120 male athletes	90 female athletes
Cereal grains	441.9±33.6	301.2±26.1
Fruits	52.4±66.8	86.5±32.9
Vegetables	332.1±44.3	399.8±46.2
Meat	93.2±13.5	64.7±16.4
Eggs	35.9±8.6	33.8±7.1
Milk and dairy products	77.4±10.7	108.9±17.2
Beans and bean products	62.3±10.1	52.6±9.2

Table 2: Questionnaire of nutrient intake by track and field athletes

Nutrient and calorie intake	Male athletes	Female athletes
Energy (kilocalories)	2998.8±242.1	2193.6±165.4
Protein (g)	120.1±18.2	86.4±10.1
Fat (g)	86.1±9.2	71.8±8.2
Carbohydrate (g)	374.2±20.1	321.9±18.6
Vitamin A (UgRE)	1359.9±148.1	1239.8±137.9
Dietary fiber (g)	26.9±2.4	33.2±3.1
Vitamin C (mg)	226.8±20.3	213.7±23.3
Vitamin E (mg)	29.1±3.2	26.3±3.9
Riboflavin (mg)	1.6±0.8	1.3±0.7
Calcium (mg)	863.8±84.5	793.8±94.1
Iron (mg)	16.3±1.8	15.1±2.4

athletes is relatively higher. Intake of fruits, vegetables and dairy products by female athletes is higher than that by male athletes, with statistical significance and significant difference. Nutrient intake condition of the athletes investigated is detailed in Table 2.

The above table indicates that, intake of energy, protein, fat, vitamin A, vitamin C, vitamin E, calcium and iron by male athletes are relatively higher, while intake of protein, fat, dietary fiber, vitamin A, vitamin C and vitamin E by female athletes are relatively higher. Intake of energy, protein, fat, vitamin A, vitamin E and calcium by male athletes are obviously higher than that by female athletes, with significant difference and statistical significance.

This investigation indicates that, nutritional level of track and field athletes is basically up to the standard and intake of nutrients is good. However, there are also some problems, for instance intake of dairy products by male athletes is relatively lower.

Possible problems at the use of nutritional foods for different track and field items:

First of all, excessive intake of fat and protein: As it is believed by some unscientific concept that, nutrition can be enhanced and physical quality can be improved by taking more meat, a lot of athletes use fat and protein foods in quantity, while ignoring the importance of vegetables, melons and fruits. In such as way, the athletes gain weight, while lose balance in nutrition. However, due to insufficiency of carbohydrate, their training quality will be poor, athletic ability fails to be improved, moreover, normal absorption and metabolism of other nutrient elements absorbed will be affected as well.

Secondly, too little intake of vitamin: To enhance the physical quality and become the genuine predator, some athletes even refuse to be a vegetarian. Such habit is

sure to cause serious lack of vitamin in the body. However, as one of the essential element assuring physical health, vitamin is favorable for the strengthening of power, for instance vitamin A can enhance the body's immunity; while vitamin B is favorable for the transformation of the nutrients, becoming athletic energy. If athletes are lack of carbohydrate and vitamin B, they will feel insufficiency of energy greatly during exercise.

Thirdly, delayed replenishment of water: Thirst is not the signal for water replenishment, not only specific to ordinary people but the athletes. Since ordinary people are in need of water replenishment every day, it is especially important for the athletes losing more water to replenish water without delay. If athletes fail to replenish water in time, it will be common for them to suffer body dehydration. In case of dehydration during exercises, burden of the heart will be heavier. Therefore, track and field athletes must replenish water without delay during training, especially mineral water, vitamin and sugar water.

RESULTS AND DISCUSSION

Relationship between various nutrient elements and track and field athletic ability: Nutritional supplement has a lot to do with the improvement of athletic ability of track and field athletes. Now, relationship between nutritional supplement and track and field athletic ability will be analyzed from the perspectives of sugar, fat, protein, vitamin, inorganic salt, water and to name more (Yu, 2013).

First of all, sugar: As blood sugar level affects the athletic ability, normal blood sugar content can only be guaranteed by fully guaranteeing the sugar intake every day. Besides, as insufficiency of glucose in the body will affect the fat in turning into energy, endurance of track and field athletes will not be guaranteed as well. Correlational studies indicate that, effective intake of carbohydrate or chocolate can not only enhance the endurance of the track and field athletes, but is favorable for body recovery of the track and field athletes after exercises. Nevertheless, sugar category, sugar supplementation time and sugar concentration shall be noticed. For instance, after track and field endurance exercise training, glycogen synthesis can only be stimulated, when supplementing glyucose within 12 h and starch within 24 h. The concentration is between 6 and 8% and it is better to include two or three kinds of sugars capable of running. If it is track and field anaerobic training, oligosaccharide shall be mainly supplemented, with concentration lower than 8%.

Secondly, fat: In the long time exercise, a quantity of energy is required, so fat shall be provided. As

enhancement of fat metabolism can save glycogen consumption, endurance of athletes will be more enduring. Correlational studies indicate that wheat germ oil can enhance endurance of athletes. Therefore, intake of fat nutrient elements can effectively save muscle glycogen and protein. However, before fat intake, it is better for long-distance runners among track and field athletes to have sesame oil and colza oil, for unsaturated fatty acid in these edible oils is relatively higher.

Thirdly, vitamin: Athletes are in need of vitamin more than that of ordinary people and vitamin B required by them is about five times than that required by ordinary people. For instance, vitamin B1 has a lot to do with track and field endurance. If vitamin B 15 is supplemented during anaerobic endurance training, oxidative metabolic rate of body tissues will be improved; moreover it can play the role of detoxication. Nevertheless, it is generally taken a week prior to the training, with a dose of 150 mg/day. While vitamin C can not only improve the synthetic ability of phosphocreatine and glycogen, but can eliminate lactic acid and accelerate aerobic metabolism, effectively preventing fatigue. Under normal conditions, supplemental amount of vitamin C is 500 mg/day. Vitamin E can enhance muscle force, prompt the synthesis of protein, prevent muscle atrophy and maintain reproductive function. In anaerobic endurance training, more sufficient vitamin E is required to be supplemented, so as to achieve oxidation resistance.

Fourthly, protein: Protein can improve the excitability, reflex activity, enzymatic activity and hormone effect of the nervous system of athletes. Lack of protein will result in decrease in muscle mass, lead to amyotrophy and anemia. Nevertheless, athletes have different protein requirements due to different track and field items and exercise loads. Protein shall not be taken in excessively, so as to avoid side effect. Usually, athletes can supplement protein according to their weight. Intake of protein for athletes of general endurance items is 1.0-1.8 g/kg, while 1.0-3.0 g/kg required by power events.

Fifth, inorganic salt and water: The greatest role played by inorganic salt is to adjust physiological function and constitute body tissues. Existing studies have found that, the microelements iron, zinc, copper, selenium and chromium have a lot to do with athletic ability. Related studies indicate, metabolic rate of iron, zinc and selenium rises at the initial stage of training. In the process of exercise, with profuse sweating, some microelements will run off, thus athletic ability of athletes will be reduced. As importance of water has been mentioned above, water loss will cause loss of salt; and loss of salt will lead to crick, lack of strength

in four limbs, lowering of athletic ability. Besides, water loss will also affect submax athletic ability and extreme working ability, so it has little to do with athletic ability of power events, pay attention to salt supplementation at the time of water replenishment.

In track and field anaerobic endurance training, other dietary supplements can be appropriately used as well, such as anti-hypoxic *Rhodiola rosea*, besides amino acid can be supplemented as well, so as to enhance muscle strength and improve its endurance level.

Nutritional ingredients required by different track and field items: There are numerous track and field items, including throwing, sprint, jumping and middle and long distance endurance items. Now, nutritional supplement required by different track and field items will be analyzed from the perspective of sports items.

Item 1: Throwing: Great muscle power is required by the throwing item. Besides, the item has short time of duration, depending on anaerobic energy of muscle. Therefore, nutrition must be supplemented in the process of training, so as to achieve the synthetic phosphagen or glycolysis energy supply effect. It is very effective to supplement a certain amount of protein powder at the time of conducting muscle strength training, so as to strengthen muscle explosive force. It is because that the muscle is constituted by protein. Whey protein is the preferable nutrition of this kind, just taken 25 g/day. Another is pure creatine, known as the evergreen of increasing muscle strength. The effect will be obvious, when the two are used cooperatively. Nevertheless, creatine is required to be used together with sugar; moreover water is required to be replenished.

Item 2: Sprint and jumping: As the same with the throwing item, strong muscle strength and explosive force are also required by this item. Therefore, it is similar at nutrition supplement. Nevertheless, disturbance of body weight shall be controlled and usage amount of creatine and protein powder shall be reduced relatively, or replaced by glutamine. Since glutamine can achieve dual effect of not only maintaining body weight but increasing muscle volume, appropriate supplementation of it can also boost immunity of athletes.

Item 3: Middle and long distance endurance item: Different from the previous two track and field items, this kind of sports item requires good speed endurance. Since athletes of the middle and long distance endurance item often suffers sports anemia after training, except for uptake of lean meat, liver and animal blood products, etc., corresponding nourishments such as beauty iron, lycopen and

Changbai Rhodioia Oral can be taken. All these nourishments play the role of oxidation resistance, hematogenesis and blood replenishing. Besides, athletes of the middle and long distance endurance item call for the increase of glycogen reserve. In the daily diet, uptake of staple food shall be increased. As the professional sports drink, Gym Drink has good effect. Besides, there are nourishments such as Vitamin Table and Sanjante Nutritional Powder, etc.

CONCLUSION

In conclusion, as dietary situation of track and field athletes in our country is basically good, nutritional requirements of respective training items can be guaranteed. Nevertheless, there are still some problems, such as too much intake of fat and protein, too little intake of vitamin, as well as delayed replenishment of water mentioned above. Since track and field items are different from other sports items, different solutions are required in respect of diet and nutritional supplement. Rational use of nutritional foods has great significance on the development of different track and field items, for it is favorable for the improvement of athletic ability, enhancement of muscle strength, strengthening of explosive force, or increase of speed endurance. In

addition, except that different track and field items require different nutritional food solutions, if allowable, it is better to prepare individual nutritional food solutions in terms of personal physical conditions, so as to achieve better effect.

REFERENCES

- Lu, W., 2005. Rational use of sports nutrition food for different track and field items [J]. *Track Field*, 01: 62-63.
- Nakavoua, A.H.W., D. Mampouya, A.N. Loumouamou, Th Silou, P. Chalard, V. Verney, G. Guyot, J.C. Chalchat and G. Figuéredo, 2013. Accelerated ageing effects on Curcubitea Pepo seed oil. *Adv. J. Food Sci. Technol.*, 5(06): 806-821.
- Yu, X., 2013. Investigation on the status quo of nutritional diet of track and field athletes [J]. *Modern Prevent. Med.*, 19: 3572-3573+3581.
- Yu, J. and M. Sun, 2012. Reflection on how to scientifically use sports nutrition food [J]. *China Health Care Nutr.*, 04: 218-219.
- Zhao, Z., G. Qiao, Q. Zhang and Z. Li, 2000. Investigation on the diet of track and field athletes [J]. *Shanxi Sports Sci. Technol.*, 01: 17-19.