

Research Article

A Study of Diet and Reasonable nutrition for Volleyball Players

Baodong Yan

Yulin University, Yulin, China

Abstract: The study provides a basis for the scientific recipes of China's volleyball team by suggests a reasonable diet and nutritional supplements. With the unceasing enhancement of competitive sports level, sports scientific research has penetrated into all aspects of sports training, from technical, tactical, physical to fatigue recovery. Bite and sup are the main source of sportive energy. The appropriate ingestion of nutrition is one of the important methods for athlete to comeback and improve the function of economy. It is a key part of volleyball training.

Keywords: Diet, fatigue recovery, reasonable nutrition, volleyball players

INTRODUCTION

Diet of athletes is one of important means to recover and improve the body's working capacity. Diet fulfills two particularly important functions in the body: Promptly replenish physical ability and compensate malleable bioactive substances consumed during biological processes. A volleyball players' nutritional assessment survey based on China currently economic and living condition shows that protein malnutrition, nutritional anemia and other symptoms of volleyball players have significantly reduced with the improvement of GNP. However, it brings the emergence of new problems at the same time since volleyball players' diet should also have their own characteristics in addition to the general principle of balanced diet, just as the same as ordinary people's diet (Sarah *et al.*, 2011). A balanced and proper nutrition is the precondition for volleyball players to achieve good results in sports. Generally speaking, volleyball players' diet should be in obedience to the general principles of balanced and reasonable diet, as well as the following principles:

- Players' diet must contain comprehensive nutrition, that is to say, in addition to meet the body's requirement of thermal energy, it should also pay attention to the collocation of animal food and plant food and provide adequate water, vitamins, minerals and fiber, etc.
- In choosing players' diet, it should be food which can supplement physical consumption, enhance athletic ability, accelerate the recovery process after intense training and prevent excessive stress and fatigue.
- Players' diet must be targeted and vary based on special characteristics, physical condition, nerves and mental workload of the players, as well as

different training stage and the actual situation of the race to choose suitable food.

- Use dietary factors to adjust the athlete's weight as much as possible and to maintain certain weight necessary for best working capacity and project level.
- Players' diet must be fewer but better, delicious, easy to digest and absorb and won't cause any burden to the digestive tract.

MATERIALS AND METHODS

Volleyball players' reasonable nutritional supplementary: The promotion function of carbohydrate and water supplement to players' physical ability in volleyball training or competition is usually neglected, so is the importance of fruits and vegetables to healthy, the facts of eating too much fat or protein, the inadequate intake of vitamin, the increased incidence of Non-confrontational fractures and the tendency of high cholesterol of individual player (Waver and Finke, 2003). Proper nutrition interventions can improve functional state of the body and physical fitness adaptation process, help to physical recovery after exercise and prevent exercise diseases.

Carbohydrate supplement and physical ability, carbohydrate supplement methods: Carbohydrate is the most important element to maintain blood glucose levels and muscle glycogen restoration during exercise. Energy supply of volleyball players comes mainly from aerobic and anaerobic metabolism of sugar because of the characteristics of volleyball players' energy systems, accordingly adequate glycogen reserves plays a very important role to physical ability for volleyball players during training and competition, therefore, carbohydrate comes the first as energy substances to volleyball players' nutritional supplementary. Players

Table 1: Proportion of three major heat-generating substances and energy-supplying in three meals

Proportion of three major nutrients (%)			Proportion of energy-supplying in three meals		
Sugar	Fat	Protein	Breakfast	Lunch	Dinner
48.6	28	23.4	20	38	42

Table 2: Comparison of three major nutrients ADI and suggestive supply quantity each person per day

Nutrient	ADI	Suggestive supply quantity	ADI/standard of suggestive supply quantity (%)
Quantity of heat (Kcal)	3391	4200	80.7
Sugar	305.2	640	48
Protein	146.0	140	104
Fat	176.0	120	147
Saturated fatty acid (g)	36.20		
Monounsaturated fatty acid (g)	47.40		
Polyunsaturated fatty acids (g)	77.40		

Table 3: Energy and food requirement for day and night

Protein (g)	Fat (g)	Carbohydrate (g)	Energy (calorie)
2.3-2.5	1.8-2.0	9.00-9.80	62-67
2.4-2.8	2.0-2.1	10.3-12.0	69-78
2.5-2.9	2.0-2.2	11.2-13.0	73-84
2.2-2.5	1.7-1.9	8.60-9.75	59-66
2.3-2.5	2.2-2.4	9.50-10.0	67-72
2.5-2.9	1.8-2.0	10.0-11.8	66-77
2.4-2.6	2.0-2.2	9.60-10.4	66-72
2.3-2.4	1.8-2.0	9.50-10.8	63-71

should intake 6-10g sugar per 1 kg of weight daily based on the suggestion from Sports Nutrition. However, the amount of carbohydrate supplement for volleyball players hasn't been identified yet because of the characteristics of energy supply for volleyball. In theory, the amount of carbohydrate supplement depends on carbohydrate itself, training session's arrangement, individual player's factor and many other environmental factors (Campos *et al.*, 2010). Factors of carbohydrate include species of carbohydrate chosen, intake speed rate and time (before, during and after exercise) and purposes (to maintain blood sugar and energy supply, to fill with glycogen and energy reserves), etc. Training session's arrangement includes energy consumption determined by daily training intensity and load. Individual player's factors include gender, body shape (BMI), players' staple and daily intake of other plant-derived carbohydrate. Training environmental factors include ambient temperature, humidity, altitude, etc.

Creatine supplement: The supplement of exogenous creatine is especially important to strength and speed sports. Most studies indicate that the supplement of exogenous creatine can increase repeated sprint power to improve the athletes' sprint ability; Creatine is one of the restricted factors to high-intensity exercise. Volleyball players should have acceleration of plus m

and sprint speed quality based on the characteristics of volleyball and energy supply. Therefore, creatine supplement for volleyball players can improve the special speed and endurance (Thomas *et al.*, 1997).

Now the commonly supplementary approach is 20 g/d, continuous 5-6d (four times a day, 5 g per one time), followed by 2-5g daily to maintain. The key of taking creatine lies in absorption rather than taking as much as better. The study indicates 5-6 g/d of absorbed dose is two to three times over the stomach and intestinal absorption capacity. Animal experiment also shows that over dose of creatine abortion (6.0 g/kg/d) can inhibit the synthesis of sports endogenous creatine. The study shows that the daily creatine needs for human body is 20-30 g, which once over absorbed, shall have no effect on increasing athletes' forces and enhancing athletic ability.

Thermal and nutrient intake, the proportion of energy provided by three meals: Table 1 shows that the energy proportion is 48.6% provided by carbohydrate as heat source from youth volleyball players' diet, 28% provided by fat and 23.4% provided by protein. The energy proportion provided by protein is significantly higher while the energy proportions provided by carbohydrate and fat are relatively low compared with the recommended amount by pyrogenic energy proportion of China athletes, which is 50%-55% of carbohydrate, 30-35% of fat, 12-15% of protein.

All kinds of nutritious intake should above 80% to prevent the body from lack of any. If it is below this level for a long-term, there may be a deficiency. Table 2 shows that fat and protein intake are high while carbohydrate is low among the three kinds of volleyball players' pyrogen material (Blitstein and Evans, 2006). Therefore, the three kinds of nutrient intake are in non-equilibrium state reflected from the survey results. The excessive protein intake indicates that volleyball players' diet is protein-based.

The structural condition of volleyball players' nutritional supplement: Athletes' energy depends mainly on the diet of protein, fat and carbohydrates. According to the balanced diet of players currently proposed, the three kinds of nutrient should be distributed by heat ratio as: 10-15% of protein, 20-25% of fat, 50-60% of carbohydrate. The energy supplemented daily for athletes should be approximately equal to the energy consumption day and night to make the body work properly. The recipes of thermal energy are determined based on the circadian energy consumption of athletes. The energy consumption includes basal metabolic, energy consumed in daily life, as well as during training and competition. The energy for growth and development should also be included for young players (Grunert and Wills, 2007) Table 3.

Table 4: Mineral requirements

Calcium	Phosphorus	Iron	Magnesium	Potassium
1200-2100	1500-2500	20-40	500-700	4500-5500
1600-2300	2000-2800	30-40	600-800	5000-6500
1800-2800	2200-3500	35-45	600-800	5500-7000
1000-1400	1250-1750	25-35	400-700	4000-5000
1200-2100	1500-2600	25-40	500-700	4500-5500
2000-2400	2500-3000	20-35	500-700	4000-6500
2000-2400	2500-3000	20-35	500-700	5000-6000
1200-1900	1500-2370	25-40	450-650	4000-6000

Table 5: Vitamin requirements

	Actual ADI	Suggestive ADI	P	Actual ADI	Suggestive ADI	P
Retinol equivalent (VA)	756.54±221.29	1500	<0.01	516.78±198.88	1500	<0.01
Oryzanin (VB1)	1.510±0.170	5	<0.01	1.1300±0.1200	5	<0.01
Riboflavin (VB2)	1.340±0.180	2	<0.01	1.0400±0.1600	2	<0.01
Ascorbic acid (VC)	67.56±10.94	140	<0.01	51.190±13.790	140	<0.01
Nicotinic acid (VPP)	20.86±2.420	20	>0.05	14.710±2.2300	20	<0.01
Vitamin E	32.33±5.710	8	<0.01	25.020±3.4500	8	<0.01

RESULTS AND DISCUSSION

The importance and requirements of vitamins and minerals: Although the vitamin cannot provide any energy, it is an essential nutrient to maintain the body's normal life activities, just like lubricant to the body. It will cause dysfunction and a variety of disorders once the body lacks vitamins. The vitamins need to be constantly replenished from the diet in order to maintain a balance even if only small various of vitamins is needed for athletes since most of the required vitamins cannot be synthesized on their own. Athlete's diet must also have a variety of minerals, namely salts, which is an important part of human nutrition. It is an essential material to maintain the normal physiological function, though only tiny needed. It plays an irreplaceable role in regulating metabolic processes of water and electrolyte, maintaining a balance of body acid-base, being better adapted to improve strength and endurance during hypoxia and so on. Circadian mineral requirements are shown in Table 4. Vitamin requirements are shown in Table 5.

Coaches and athletes are often not aware of the fact that water is also an essential nutrient. The mass lack of water will greatly reduce the ability of the athletes, easily lead to sports injuries, even shock and death sometimes. If the loss of water is more than 2% of body weight, it may cause adverse effects; therefore, athletes should pay attention to replenish water after training, which the best solution is to drink a few glasses of water after training at first, then drink some juice and eat some fruit or food.

Besides, it is also very important to maintain a pH balance with athletes' diet. Acidic foods, like fish, meat, poultry, eggs and rice and alkaline foods, like fruits and vegetables, should be eaten in collocation. Athletes should eat more alkaline foods to neutralize and prevent a decreased exercise capacity caused by

physical acidification since lactic acid and other acidic substances are accumulated more in vivo after training.

CONCLUSION

In summary, it is essential to strictly follow the general and special dietary principles with the volleyball players' diet and to implement them as an important part of scientific training. It should be considered to change athletes' diet when athletes' performance can't be improved all along, or sports injuries reoccur in a long period of training, which may lead to unexpected results.

REFERENCES

- Blitstein, L. and D. Evans, 2006. Use of nutrition facts panels among adults who make household food purchasing decision. *Nutr. Educ. Behav.*, 38: 360-364.
- Campos, S., J. Doxey and D. Hammond, 2010. Nutrition labels on pre-packaged foods: A systematic review [J]. *Public Health Nutr.*, 14: 1496-1506.
- Grunert, K. and J. Wills, 2007. A review of European research on consumer response to nutrition information on food labels. *Public Health*, 15: 385-399.
- Sarah, C., D. Juliana and H. David, 2011. Nutrition labels on pre-packaged foods: A systematic review. *Public Health Nutr.*, 14: 1496-1506.
- Thomas, B., A. Boaz and M. Rayner 1997. *Food Labelling and Healthy Food Choices*. British Heart Foundation Health Promotion Research Group, Oxford.
- Waver, D. and M. Finke, 2003. The relationship between the use of sugar content information on nutrition labels and the consumption of added sugars. *Food Policy*, 28: 213-219.