

Research Article

Study on the Relation between Long Distance Race Results and Dietary Intervention

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Abstract: At present, China men's distance running still has big gap compared with the level of world class, only a few women's distance running athletes reach the world level. Where dose our gap are compared with the world class? How are the developments of distance running? For these questions, I record each item in accordance with the medium to long run changes in competition and athletes training methods to do some introduction and analysis. The full text contains seven chapters including the introduction of distance running, the basic requirements for distance running athletes, distance running and race tactics, training methods, training programs, pre-training, coaches and management.

Keywords: Dietary intervention, dietary nutrition, long distance race

INTRODUCTION

During the past decade, rapid expansion in a number of relevant scientific fields and, in particular, in the amount of population-based epidemiological evidence has helped to clarify the role of diet in preventing and controlling morbidity and premature mortality resulting from Non Communicable Diseases (NCDs). Some of the specific dietary components that increase the probability of occurrence of these diseases in individuals and interventions to modify their impact, have also been identified (US Department of Health and Human Services, 1990).

Food and food products have become commodities produced and traded in a market that has expanded from an essentially local base to an increasingly global one. Changes in the world food economy are reflected in shifting dietary patterns, for example, increased consumption of energy-dense diets high in fat, particularly saturated fat and low in unrefined carbohydrates (Blair *et al.*, 1989). These patterns are combined with a decline in energy expenditure that is associated with a sedentary lifestyle-motorized transport, labor-saving devices in the home, the phasing out of physically demanding manual tasks in the workplace and leisure time that is preponderantly devoted to physically undemanding pastimes. The Consultation provided an opportune moment for FAO and WHO to draw on the latest scientific evidence available and to update recommendations for action to governments, international agencies and concerned partners in the public and private sectors. The overall aim of these recommendations is to implement more

effective and sustainable policies and strategies to deal with the increasing public health challenges related to diet and health.

OVERVIEW OF LONG DIATANCE REN AND DIETARY

In recent years, the level of the medium and long distance run were improved in an astonishing way all around the world. Some high-level athletes continued to break the world records, how to train such world-class athletes? Which kind of training methods they are using? I think it is the same way that they have to pay a lot what is hard to imagine for ordinary people in order to break through the limits (World Health Organization, 2003).

Treadmill exercise is the foundation of all sports and also what everyone can participate in. Since the birth of competitive sports, the faster are the most common human capacity to be commendable. In the past few decades, the road race also reflects the substantial increase in the popularity of treadmill exercise. On almost all major cities in the world it has its own "City Marathon." Although all people have the ability to run, but not everyone can become a great sprinter. Outstanding Middle and Long Distance Runners need talents and succeeds through the systematic training of scientific and reasonable way of life. Outstanding distance running athletes want to achieve a high level also need psychological training, as well as the understanding of mury.

Figure 1 Mean 6 standard deviation plasma Thyroxine (T4) concentrations in sled dogs before and

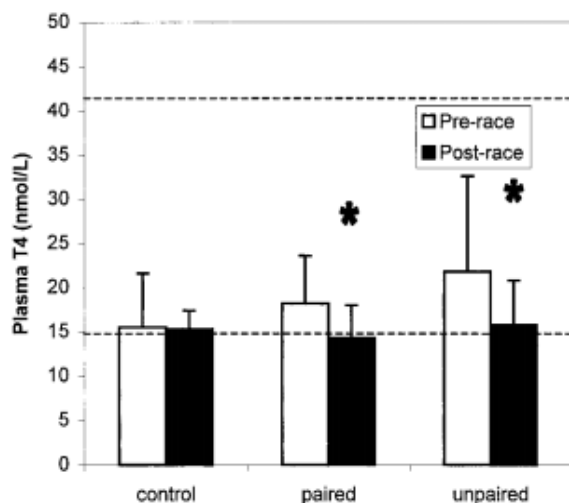


Fig. 1: Comparison of results (T4)

after completion of a long-distance sled race. Control, dogs (n 5 4) that were not conditioned and did not participate in the race; Paired, dogs (n 5 15) sampled both before and after the race; Unpaired, dogs sampled either before (n 5 16) or after (n 5 24) the race. The hatched lines represent the upper and lower limits of the reference range in dogs that are not sled dogs $p = 0.05$.

Middle-distance race, including distance between 800 and 1500 m and distance between 5000 and 10000 m, is a kind of athletic sports with the characteristics of speed and stamina. The first time it appears as the formal event is on Athens Olympic Games in 1896. But to be formal event of Olympic Games, twist road. Luckily women's middle-distance race has passed a long and in 1960, Roman Olympic Games put 800 m to be formal event, which is the beginning of women's middle-distance race. In 1996, 5000 m has been set up as formal event of women's middle-distance race, then, women and man is fair in the field of middle-distance race. Amine *et al.* (2002) Middle-distance race brings forward a high request to athletes and from angle of the difference of women and men, women's middle-distance race is more difficult.

Chinese women's middle-distance race developed on a low level and don't appear until the new country founded. With the development of economy and recognition of government, Chinese women's middle-distance race developed speedily in 1990s (Nishida *et al.*, 2004). In 1986, Sunsumei set a new record of 800 m, with the grade 1:58. 56, wick is also the best grade of Asia. In 1987, Quyunxia get a grade of 4:0771 in 5000 m, which set a new record both here and abroad and at the same year, Wangxiutingset a new record of 3000 m with a grade of both here and abroad. In 1988, Wangxiuting wan the eighth in 10000 m in Seoul Olympic Games. All these made Chinese women's middle-distance race near to the world women's middle-distance race in 1990s, Chinese top of the world gradually. In field games 1991, the third world

championship of track-and in Tokyo, Chinese athletes wan the first and the third. In 1992, in the twenty-fifth Olympic Games, Quyunxia wan the second in 1500 m and Liuli wan the fifth. In 1993 in the seventh athletic of meeting, Liudong 1:55. 54, which is set a new record 800 m with a grade of also the best grade in china until now. At the same time Wangjunxia set a new record of 3000 and 10000 m and Quyunxia record of 1500 m. Till now, Chinese women's middle-distance set a new race come the top. But with the leaving of "Ma jia jun" and the retire of those excellence athletes. Chinese women's middle-distance race downslide gradually. In this situation, we must analyze recent problems and bring forward a feasible to made Chinese women's middle-distance to the top of the world again.

For this purpose, based on the statistical analysis of the best grade of women's middle-distance race here and abroad in each year from 1990 to 2005, with the methods of literature and material, questionnaire, comparison and statistics etc., the thesis researches and analyzes the current women's middle-distance race development of China and the world and draws the graph at the same time. We can see the characteristic of Chinese women's middle-distance, such as instability, unbalance the lack of auxiliary difference between Chinese and the world athletes and so on. At the same time we discovered that the world women's middle-distance race improving speed of the level is becoming slower. This off provides us with opportunities a hope for our country's women's middle-distance race to catch up with the level of the world. Therefore this research overcomes the one-sidedness of analyzing only from one aspect and treats the development of women's middle-distance race as a complex project and provides corresponding strategies in the fields of conception, training, athlete, etc. We hope that, it can provide feasible theoretical and practical foundation for the new rising of Chinese women's middle-distance race. This is also where we the significance of this research lies (Rao and Agarwal, 1999).

METHODOLOGY

The relation of dietary nutrition and physical fitness:

Objective: To know the dietary nutrition and physical fitness of female students in higher vocational school in Wuhan and to study the relations between dietary nutrition and fitness in order to combine nutrition education with physical activity to physical fitness.

Methods: A stratified sample and cluster sample of 420 female residents of 4 grades (aged 18-20 years) in Wuhan. There were 274 students who had majored in nutrition courses and 146 students who did not major in nutrition courses. The weights of both the raw and cooked dishes were obtained by the weighting method. A 3-days dietary survey by 24 h retrospection and a

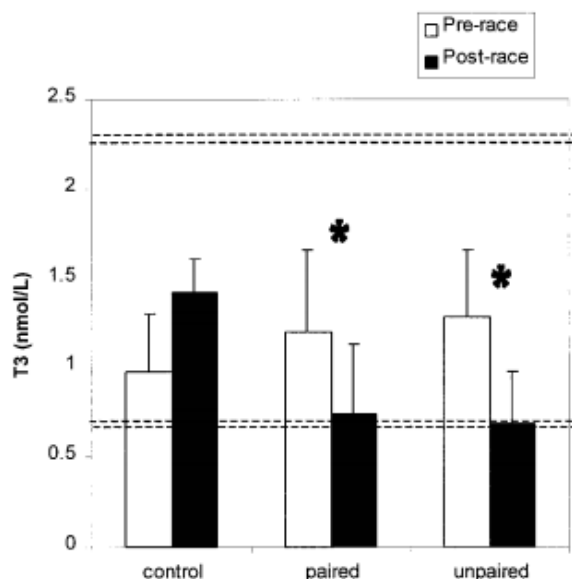


Fig. 2: Comparison of results (T3)

food frequency questionnaire were performed. Then nutrient intakes were calculated and compared with the Dietary Reference Intakes for mild physical activity female adults.

The indices of the physical fitness include body height, body weight, chest circumference, eyesight, blood pressure, vital capacity, 50 and 800 m run, one-min sit-up, body fat and hemoglobin. The evaluation was conducted according to the "standard of physical fitness for students". The statistical analysis, such as t test, chi-square criterion and correlation analysis were conducted by the software of SPSS (Table 1).

RESULTS

- Diet there were significant difference group ($p < 0.01$). The daily intakes of meat, between the nutrition group and non-nutrition fish, eggs, milk nutrition group than non-nutrition group. The consumption and bean products were more in of aquatic products, eggs, milk and milk products and bean products in both groups were lower than the recommended intakes.
 - The energy and nutrients the intakes of calorie and protein respectively were 90 and 103% of RNI in nutrition group and 82 and 87% in non-nutrition group ($p < 0.01$). The intakes of calcium, iron, zinc, vitamin A, thiamin, riboflavin and vitamin C in nutrition group were more than those of non-nutrition group ($p < 0.01$). The calorie intake from three macronutrients respectively was protein 13.6%, fat 36.6% and carbohydrate 49.8% and the calorie from fat was higher than recommended intake. Also, the calorie intake from breakfast was lower and the calorie intake from supper was higher than recommended intake. The ratio of the calorie from three meals in nutrition group was better than in non-nutrition group.
- Figure 2 Mean \pm 6 standard deviation plasma 3, 5, 39-Triiodothyronine (T3) concentrations in sled dogs before and after completion of a long distance sled race. Control, dogs (n 5 4) that were not conditioned and did not participate in the race; Paired, dogs (n 5 15) sampled both before and after the race; Unpaired, dogs sampled either before (n 5 16) or after (n 5 24) the race. The hatched lines represent the upper and lower limits of the reference range in dogs that are not sled dogs $p = 0.05$.

Table 1: Inorganic salt intake per person per day on average

Inorganic salt (mg)	Dietary survey for the first time (4 weeks)		The second dietary survey (8 weeks)	
	Intake	Intake/recommended (%)	Intake	Intake/recommended (%)
Na	4521.1		4578.9	
Ka	2894.9	81.1	3426.5	98.3
Fe	33.1	133.0	46.3	145.8
Ga	742.2	76.0	1559.3	92.7
Mg	454.7	118.5	495.7	128.7
P	1673.4		1706.1	
Zn	17.6	88.8	16.6	83.8
Cu	1.3		2.0	
Mn	6.0		6.4	
Se	107.8	233.8	106.2	232.2

Table 2: The average intake per person per day of vitamin

Vitamin	Dietary survey for the first time (4 weeks)		The second dietary survey (8 weeks)	
	Intake	Intake/recommended (%)	Intake	Intake/recommended (%)
Vitamin A (RE)	850.7	57.8	1756.3	118.2
Vitamin E (mg)	66.9		74.9	
Vitamin C (mg)	90.2	49.9	244.6	127.1
Vitamin B1(mg)	1.6	59.8	4.3	149.8
Vitamin B2 (mg)	3.0	159.8	5.1	264.8
Vitamin PP (mg)	38.2	191.8	59.3	297.3

Table 3: Long distance running performance comparison

Project (m)	After the winter training	The first test scores	The second test scores	Competition period
The men's 800	1:53.50	1:55.90±1.4	1:54.40±1.2	1:52.50
The women's 800	2:13.40	2:14.20±1.6	2:12.40±1.3	2:10.10
The men's 1500	3:54.00	3:55.40±0.8	3:52.60±0.9	3:51.80
The women's 1500	4:32.00	4:35.60±1.1	4:32.20±1.3	4:28.60
The men's 5000	14:28.00	15:50.00±2.8	14:30.00±2.6	14:25.00
The women's 3000	9:55.00	10:05.00±4.6	9:59.00±3.4	9:54.00

- Physical fitness the average of body height, body weight and chest circumference were 159.38 and 4.98 cm, 50.76±5.96 kg, 78.30±6.28 cm, respectively for higher vocational school female students, were significantly lower than the national values (159.45 and 5.54 cm, 51.30±3.67 kg, 79.88±5.14 cm, respectively) for female students in city ($p<0.01$). Also the average of vital capacity and the vital capacity index were significantly lower than the national values for female students in city ($p<0.01$). The average scores of 50 and 800 m-run and 1-min sit-up were significantly higher than the national values for female students in city ($p<0.05$). The rate of overweight estimated by the weight for height, body mass index (BMI or body fat) BFI was 3.4, 8.0 and 21.2%, respectively (Table 2).
- Common disease the rates of blood pressure in upper limit of normal, short sight and anemia were 1.78, 68.78 and 25.75%, respectively. Compared with national level, the former two were lower and the later was higher than the national values for female students in city. Of all anemia subjects, 87% students cared their body type very much; only 13% students did not care their body type.
- Relations of dietary nutrition and physical fitness The weight gain in 3 years is positively correlative with the intakes of protein, niacin and calcium ($p<0.05$); the height gain is positively correlative with the intakes of protein, riboflavin and calcium and the frequency of milk intake; and the vital capacity index is positively correlative with intakes of protein, thiamin and iron. The score of 800-m run is positively correlative with the intakes of calorie, protein, thiamin and iron. However, the scores of 50-m run and one-minute sit-up have no obvious correlations with nutrients (Table 3).

CONCLUSION

In this study, it has been shown that nutrition education had received obvious results on improving teen 'intake of food. Compared with the national level,

the stature and vital capacity of female students in higher vocational school were smaller, but the athletics scores were better than that of national values, which shown that sports activities in school evolved better than before. The detection rate of anemia was higher than that of national level, which was related to blind on diet and it would be an emphasis of nutrition education for future. Some nutrients, such as protein, high quality protein and calcium can improve both body height and body weight. And the intake of egg and milk can significantly promote height growth. The intake of protein is correlated with the improvement of function of lung.

REFERENCES

- Amine, E., N. Baba, M. Belhadj, M. Deurenbery-Yap, A. Djazayery, T. Forrester and D. Galuska *et al.*, 2002. Diet, Nutrition and the Prevention of Chronic Diseases: Report of a Joint WHO/FAO Expert Consultation. World Health Organization, Geneva.
- Blair, S.N., H.W. III Kohl, R.S. Jr. Paffenbarger, D.G. Clark, K.H. Cooper and L.W. Gibbons, 1989. Physical fitness and all-cause mortality. A prospective study of healthy men and women. *JAMA*, 262: 2395-2401.
- Nishida, C., R. Uauy, S. Kumanyika and P. Shetty, 2004. The joint WHO/FAO expert consultation on diet, nutrition and the prevention of chronic diseases: Process, product and policy implications. *Public Health Nutr.*, 7(1A): 245-250.
- Rao, A.V. and S. Agarwal, 1999. Role of lycopene as antioxidant carotenoid in the prevention of chronic diseases: A review. *Nutr. Res.*, 19(2): 305-323.
- US Department of Health and Human Services, 1990. Healthy people 2000: National health promotion and disease prevention objectives-nutrition priority area. *Nutr. Today*, 25(6): 29-39.
- World Health Organization, 2003. Diet, nutrition and the prevention of chronic diseases. Report of the Joint WHO/FAO Expert Consultation. WHO Technical Report Series, No. 916, WHO, Geneva.