Study on the Use of Vegetables and Fruits in Athlete's Nutrition

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Abstract
Eating fruits and vegetables can cover 90-95% of vitamin C and 60-80% of the vitamin A needs of an adult living in normal environment who practice a profession requiring a moderate energy consumption. This is also true for athletes in recovery phase. The present paper presents a study about the use of vegetables and fruits in the diet of athletes.

Keywords: *vegetables, fruits, athletes nutrition, athletes rations*

1. Introduction

Vegetables and fruits are part of the group that includes all foods of vegetal origin containing lot of water. Vegetables and fruits are a source of vitamin C. The role of vitamin C in the body is very important. It is involved in cellular respiration stimulating redox processes. Enhances the antitoxic action of the liver and increases the overall resistance of the organism. For this reason, sport activity vitamin C should not only be used sporadically or before the start but systematically throughout the training and competitions[1]. Vegetables and fruits are the most important source of carotene (provitamin A)[2]. Highest in carotene content belongs to: leafy greens, carrots, beets, tomatoes, radishes, cherries, cherries, peaches. Vegetables and fruits, in addition to their high vitamin content, also contain minerals[3]. As food predominating alkaline miliequivalents providers they are indispensable for ensuring the acid-base balance of the ration for athletes. Fruit and vegetables are also a source of carbohydrates which, along with vitamins, increase glycogen reserves in liver and improve its functional status[4].

2. Materials and methods

Research method is based on bibliographic study and experimental methods. The production of vegetables and fruit is seasonal. In order to ensure a continuous supply of the organism with vitamins these are kept preserved by freezing or dehydrated. Therefore this research took into account only the often used in athlete rations categories (Table 1).

3. Results and discussion

Considering Table 1, the feed ration shall be determined every week (Table 2). On average amounts protein content, fat, carbohydrate and caloric value is also stated [4].
During sport activities the need for Vitamin C reaches an average of 150-200 mg per 24 hours, while during the competitional stage may reach 300-400 mg per 24 hours (even up to 500 mg per 24 hours on authors opinion)[5]. This dose must not be exceeded as it may cause various

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undesirable side effects including sleep, excitement, muscle cramps. In case of hypovitaminosis C muscle fatigue may occure. This happens more often in winter and spring due to lack fresh vegetables in the diet. Vegetables and fruits should provide 15% of the caloric value of the ration[4]. If this percentage is not reached it is desirable to provide a supplement of Vitamin C athletes as juices. In some studies a correlation between vitamins is required as an excess of one vitamin may influence the effect of another. For example, vitamin A in excess leads to hypovitaminosis C.

Table 1. The content of vitamins and minerals per 100 g of food (vegetables and fruits) consumed in athletes rations[2]

Vitamins per100 g food				Mineral elements in mg per 100 g food				
Food	Caroten	B1	C	K	Na	Ca	Fe	P
Carrots	500	300	25	220	100	50	1	40
Peppers	2500	110	150	240	30	45	1	45
Cabbages	80	100	40	400	30	72	1,5	60
Onions	2000	40	45	270	20	40	0,6	45
Tomatoes	1500	35	10	310	25	15	0,6	30
Apples	50	45	5	120	3	8	0,4	10
Pears	50	60	5	130	3	12	0,2	12
Oranges	250	60	50	200	4	50	0,4	23
Lemons	250	50	50	170	3	40	0,6	20

Table 2. The average amounts of fruits and vegetables composing the athlete ration (protein content, fat, carbohydrate and caloric value)

Food	Quantity per week	Proteins	Fats	Carbohydrates	Calories
Vegetables (onions, cabbages, carrots, peppers, tomatoes)	7 days x 400g = about 3000 g	16	31	3400	1280
Fruits (apples, pears, oranges, lemons)	7 days x 300g = about 2000 g	20	17	308	1165

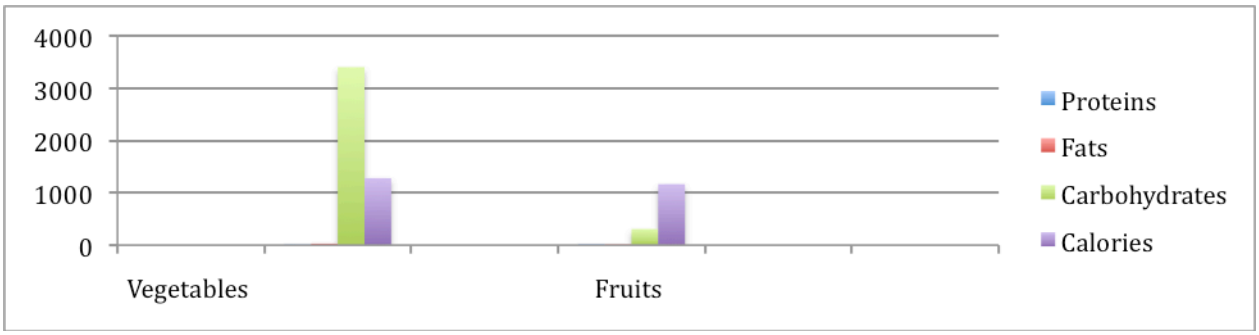

Figure 1. The content of protein, fat, carbohydrate and caloric value of the athlete ration consists of vegetables and fruits

4. Conclusions

1. Consumption of fruits and vegetables can cover up to 90-95% of vitamin C and 60-80% of carotene needs.
2. Vitamin C should not only be used sporadically or before the start but systematically throughout the training and competitions.
3. Vegetables and fruits should provide 15% of the caloric value of the ration.

4. A 500 mg per 24 hours Vitamin C dose should not be exceeded as it may produce various undesirable side effects including sleep, excitement, muscle cramps etc.
5. Consumption of vitamins must be correlated, as the excess of one may influence the other effect in a negative way.

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