

NUTRITION AND MEANS OF RECOVERY TACTIC IN MIDDLE-DISTANCE RUNNING

(Professional paper)

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Abstract

Nutrition of a middle-distance runner includes not only carbohydrates and fats which provide not only the largest amount of energy for a competition and training, but also contain other nutritious substances which help recovery and ensure regular functioning of organism. Those nutritious substances are: carbohydrates (sugar), as the most appropriate source of energy for player's organism; fats (lipids), as a significant source of energy and carrier of certain vitamins; proteins, significant for development, tissue recovery and metabolism; vitamins, for better functioning of metabolism; minerals, significant for body metabolism, water, which comprises 60% in the organism and should be regularly renewed.

Keywords: *training process, training methods, athletes, carbohydrates (sugar), fats (lipids), proteins, vitamins, minerals, water, load training*

INTRODUCTION

Although 1500m running disciplines are perhaps the most attractive to athletics fans, 800m discipline is a real middle-distance discipline, without precedent. It is the only discipline where aerobic and anaerobic energetic systems are used almost to the same extent and where only one mistake of a runner can ruin chances for success.

Nowadays, a two circle race is run feverishly and physical contact among runners is almost inevitable. It actually represents survival of runners who are prepared best, not only physically and as runners, but also as the toughest ones, the most positively oriented and the most aggressive. An 800m discipline runner has to be aware of these facts and has to be very cautious during the whole race in order to take advantage of every insecure or clumsy step of the opponent.

Slower tempo of a race in 1500m discipline makes it less exciting in sense of a tactic, but only from the outside point of view. In a certain way a 1500m race is more difficult than an 800m race, because it is necessary to be concentrated in a longer period of time. Whereas the critical phase in an 800m race mostly appears during the third 200m, in 1500m race it can last even until the third circle. This is the time when imperturbability is the most important as well as the ability to keep the mental stability.

Maintenance of competitive speed when a runner starts feeling fatigue requires more and more effort, despite natural need to relax. Tempo assessment is actually

only a matter of learning the most efficient dose of speed for certain effort during the whole race, which most of the runners can achieve.

It is believed that running in an even tempo is an ideal way of running middle-distance races. However, by analysing mean time of world record-holders, a conclusion has been made that tactical situations often impede accomplishment of this ideal.

Nutrition of middle-distance track runners

It is known that during a training process methods which are applied result in huge energy consumption and engagement of metabolic processes are responsible for energy generation mostly in aerobic way, when intestinal and muscle fibres are engaged most, whereas in sprint disciplines the methods applied use anaerobic metabolic processes and engage white muscle fibres to a greater extent.

What metabolic process will generate energy depends first of all on regime and character of a training process that is on load and structure. Therefore it is very useful to know which sources of energy are exhausted for particular type of load, as well as how long it takes to recompensate particular depots with appropriate energy substantial means.

Middle-distance runners need this kind of nutrition which has different types of food providing basic nutrients not only for running, but also for good health. Importance of each nutrient for a runner can be seen only after its detailed examination. Therefore, some small

changes in nutrition which will provide intake of proper kind and quantity of food are recommended.

1. Carbohydrates (sugars), are the main source of energy in large number of running disciplines demanding endurance and they are used most during heavy load, so that it is necessary to compensate for them immediately after finished work. A runner loses fats as the main source of energy only in marathon and other long-distance disciplines. Carbohydrates are found in nutrition only in forms of starch and sugar, and they are transformed in glycogen in muscles so that they can be used for creation of energy. Each gram of carbohydrates will make more calories of energy and it will use 0.7l of oxygen in that process. Storage of this substance which is burnt in a body will last about 100 minutes of running with fixed tempo.

The name carbohydrates indicate that they are compounds of carbon and water. As it is well known, the sugars are not a synonym for carbohydrates. When we say sugar we think of food of sweet taste, and since polysaccharides are not sweet, the correct name which would be the implication for all these substances are carbohydrates. The notion of sugar in commercial use denotes saccharose (a disaccharide consisting of glucose and fructose).

Although sugar (for example bread, sweets, fruit, vegetables) creates the same amount of energy, while the bread is a more suitable form of carbohydrates for running disciplines, since it has also some minerals and vitamins, while and they are not found in food which contains only sugar and is often named "food with empty calories".

2. Fats (lipids) are a source of energy of long duration and they are used together with carbohydrates when athlete's body works with mediocre intensity, when saving of reserve of carbohydrates is achieved. If body starts working with small amount of carbohydrates, use of body fats is increased. Reserves of fats are so large that they could provide energy for a few days, what is not the case with carbohydrates. Reserves of fats are transformed into so-called "free fatty acids" which are used in muscles for creation of energy. One gram of fat creates 9 calories of energy, spending 2,03l of oxygen on that occasion. Thus, since fats create two times more energy per gram in comparison with carbohydrates, oxygen expenditure in energy production is much bigger.

For usual sport efforts, fats represent large and unexhaustible reserve, but this so favourable way of getting energy also has its limitations. It practically means that, since the intensity of work is bigger the speed of energy delivery processes must be faster for cells of the engaged muscles, and that process cannot be realised through fats. Namely, it has been noticed that by burning fats the energy for long – term but less intensive work can be created and thus a role of fats is limited and less efficient.

During long-term work of reasonable intensity, sharing of fats is increased. It has been determined that during the first hour of hard training the fats participates

with 50% in energy production, and as the training continues this percentage grows and it can be 80% for top middle-distance runners.

3. Proteins are the main building material in human body and they comprise 12-20% of the body mass. A protein molecule originates from polymerizing amino acids and it contains of an acid and base groups. Proteins are formed by different combinations of 22 amino acids, 10 of which are important for humans, and they are so-called essential ones, that is irreplaceable (arginine, phenylalanine, histidine, isoleucine, leucine, lysine, methionine, threonine, tryptophan and valine). If nutrition does not contain sufficient quantity of essential amino acids, then unwanted disorders in complex biochemical processes of human body can appear. As we already know, amino acids are also necessary for physiological roles of vitamins and minerals.

Athletes who compete in disciplines where strength is necessary and who should develop muscle mass, will need even up to 4 grams of proteins per kilogram of body mass. Some strong athletes take protein in a form of powder as food supplement. However, it is mostly thought that it is not necessary because majority of diets provide enough proteins.

Proteins are found in food of animal and plant origin. Food of animal origin is usually known as pure protein food. Food of plant origin is considered as food with fatter content of proteins.

4. Vitamins belong to neither building nor energetic substances, but to regulatory ones. Actually, vitamins act as coenzymes because they stimulate activity of enzymes and contribute to various chemical processes which regulate metabolism, create energy and renew tissues. As it is known, vitamins are soluble in water or in fats and they represent micronutrients because they operate in very small quantities.

Water-soluble vitamins have an important role in metabolism of proteins and it is thought that they are used as a consequence of hard training. Therefore, it is important that runners choose food rich in such vitamins, and not food which is often called "non caloric" and thus, bread should be chosen instead of sugar. These vitamins are also easily destroyed during preparation of food and cooking, what is a good reason for including fresh fruit and vegetables in a diet and avoiding overcooking vegetables.

If there is an adequate quantity of vitamins in a runner's diet, no supplements will be necessary. However, it can be useful for middle-distance track runners in order to supplement quantities of vitamins B and C. However, fat-soluble vitamin supplements can be dangerous and this is the reason why a runner should take in vitamins A, D, E, K only through food, primarily with proteins and carbohydrates, and not through vitamin supplements.

5. Minerals are inorganic substances, and like vitamins, have equally important role in metabolic processes of the organism. If there are not enough minerals in a diet for any reason, some very serious disorders can arise. In relation with this statement, it is very important

to mention that whereas organism can synthesise some types of vitamins, minerals cannot be produced, but taken in through food.

There are 22 minerals in human body which are considered to be significant for life, because they are parts of hormones, enzymes and vitamins. Synergy of vitamins and minerals is necessary because many complexes and enzymes cannot perform their functions without minerals.

The needs of human organism for some of the minerals are greater and for some are smaller. Larger needs include calcium, phosphorus, magnesium, sodium, chlorine, potassium and sulphur, whereas extremely small quantities of some other minerals, that are the trace elements, by only 100 parts per million, are needed for protection of athletes' health (iron, cobalt, copper, zinc, chromium, selenium, iodine, fluorine, manganese, molybdenum, etc.)

Iron is usually supplemented in runners' food, but it should be done cautiously because the organism cannot dispose out the surplus of iron and which could lead to toxicity.

6. Water is neither energetic nor a building substance, but it belongs to a group of the most important nutrients, because life is impossible without it. It is necessary for human organism to function properly. Water is necessary for transport of nutrients and regulation of body temperature. During long competitions or when the weather is warm, a runner usually loses a big quantity of water and becomes dehydrated. Consequently, the organism cannot function efficiently and it can lead to stressful situations due to heating. Therefore, runners should take large quantities of liquids, especially during long races or in areas where it is hot.

INSTEAD OF A CONCLUSION

Recovery of middle-distance track runners during competing and training period is not only important, but it also represents a component of their integral and continuous system of preparations. In connection with this, it should be emphasised that the essence of a process of recovery from hard trainings and competitions does not lie in simple return to a normal level of sequence of processes, for example biochemical or physiological level which most often lead to fatigue, but in bringing abilities to all organs and systems back, that is, in establishing homeostasis of the whole human organism. It means that a primary task of a recovery process is that a runner is brought in such a state in the shortest possible time, in a state in which he can receive load that is so-called supercompensation in order to achieve the most optimal cumulative effects possible.

Sports science today has enough data about specific features of a recovery process for runners, depending on a running discipline, character, intensity, training regime, training conditions, health and a level of being prepared. Training means of recovery are considered to be basic, taking into account that they provide efficient course of a recovery process on the account of a well

planned and well conducted training process.

A central part in the integral training process is taken, on one hand by directing work abilities of a runner, and on the other hand, by proceeding of a recovery process. In connection with this it has been established that when uniform training content is conducted, athletes show lower work ability than when various programmes are applied. The reason is that recovery processes are more efficient due to favourable influence of change of training exercises character and regime of their alternation.

Experience from practical work shows that, if in a case of insufficient recovery after the first training, the same training is performed, and then fatigue appears faster. However, if original direction of the second training is changed, intensification of a recovery process is obligatory after the first training. Exercising during a couple of hours of next training, which is by intensity of load significantly weaker and of different direction, can successfully contribute to even faster recovery, on condition that a rational choice of suitable exercises was made.

As one of the most important factors during a rational training process appears to be the rhythm, that is the dynamics of training load and the rest, which should be balanced well. It is necessary to know that it cannot be regulated through training and periods of rest, but through the system of balanced loads in a longer period of time, with their gradual fall. In that case, a part of training work is conducted on the level of incomplete recovery of some functions in order to decrease, more or less, the load later. That would enable complete recovery. In relation to this, in most cases uneven, gradual or wavy alternations of load are planned. This enables growth of dynamics of work abilities and for these reasons rhythm of a training process cannot be permanent and constant, but individual and it should depend on alternation of tasks and compound of extensity training and load training, how well the techniques are mastered and depend on a calendar of competitions as well.

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