THEORY

Nutrition

In basketball, the exertions due to the sporting activities vary and rate as most complex motor activities. In this sports game, high speed is required, as well as endurance, strength and coordination with constant change of intensity. Because of that, the optimal sport nutrition is one of the most important factors for reaching the maximum physical endurance.

Any organism, in order to live, develop and work, must eat. Nutrition has importance for the human being. First of all, through nutritional articles one receives substances needed for the building of cells and tissues, generation of energy for physical and mental activities and, finally, nutrition plays also a protective role in the organism, since food contains substances which protect organism from different diseases and defects. Nutritional articles have one more characteristic, they may be also the origin of disease, since through spoiled food, intestinal diseases are transmitted as a result of unhygienic handling.

A person is required to eat every day. Its health depends on the correct diet i.e. from the presence of all the necessary substances, which are found in certain foods of animal or plant origin. However, all foods must not contain the nutritional elements essential for the organism. The food contains nutritional components among which carbohydrates, fats, proteins and protective elements which include water, vitamins and mineral salts. Some of the foods contain a certain nutritional element, but may have poor content of others, so that only a mixed diet can provide the organism with all that is necessary for life.

Proteins

Proteins are substances from which all organs and tissues of the body are built, and one differentiates between proteins of animal and plant origin. They disintegrate in the digestive organs into its component parts - into amino acids. Only in this form the proteins are absorbed into blood. If there is not enough protein, the development slows down, tissue renewal stops and the resistance of the body to infections is reduced. Physical work and sports cause augmented consumption of proteins in the organism. In particular high consumption results during long-term physical activities as, for example, cycling, cross-country skiing, etc. In those cases, the quantity of proteins in a meal must be augmented up to 2-3 grams per 1 kg of the body weight. Research has proved that an augmented quantity of proteins in a meal leads to augmented irritation of the central nervous system and strengthens conditioned reflex action. At the beginning of the training, use of proteins is increased, while later in the course of the training decreases. Because of that, the quantity of proteins in the diet of sportsman must be increased at the beginning of the training period. A larger quantity of proteins is recommended in meals during the period when one expects of a sportsman to increase the volume and strength of the muscles (disc throwers or body builders etc.). One must pay attention in particular that meals such as breakfast and lunch include animal proteins while they should be avoided for the dinner.

Diet of sportsmen must include 250 to 300 grams of protein per 24 hours. Recommended are in particular beef and mutton, since these are assimilated easiest in the organism. Liver, especially veal liver is also very valuable food since it contains proteins as well as vitamins and minerals, both very much required for the sportsman. Daily meals of a person exercising must also contain fish products, milk and dairy products, eggs, vegetables, fruit and bread.
Proteins are substances, which also provide energy for the organism since 1 gram of proteins gives 4.1 calories.

Carbohydrates

Basic substances providing energy to the human body are carbohydrates. They may create reserves in form of glycogen deposits in muscles and liver. According to research results a total of about 300 to 400 grams of carbohydrates is deposited in the body. Trained person, such as sportsman, has a reserve of carbohydrates up to 600 grams.
Heart, nervous system and the muscles in movement use up carbohydrates as the energy source since they are assimilated easily during any work.

Starch makes the main mass of carbohydrates and, according to the recommendation of the Russian doctors, it must represent 64% of the total of all carbohydrates in the diet. However, starch from different foods is also differently digested. Starch from potato and rice is most rapidly digested, while that from rye, beans, lentil and horse bean is digested at a slower rate. Of sugars one has to mention mono-saccharides and disaccharides, which are differently absorbed in the body, but usually have the same effect. They are used in cases when the energy sources of the organism have to be replenished rapidly and the working ability of the sportsman strengthened. However, most of the sportsmen are aware of the functions of sugars and take them in form of glucose in greater quantities even without any special need. It is a duty of the sports physician and coach to explain that extra intake of glucose may cause unwanted consequences. The carbohydrate reserves are best filled up by using foods rich in glycogen and starch.

Foods of animal origin contain glycogen (meat, liver) while starch is found in foods of plant origin i.e. vegetables but also in bread and bakery products. Monosaccharides and disaccharides are found in large quantities in fruit, honey, berries and sugar.

It is recommended for person exercising and involved in sports to include in its diet bread (whole wheat), rice, dates, grapes, bananas, potato, carrot and red beet.

The total quantity of carbohydrates (sugars) should not exceed 150 grams per 24 hours.

Fats

Fats are a reserve energy source of the human body. They can accumulate in larger quantities at certain parts of body and create deposits from which the energy can be extracted for several days. The source of deposited fat are fats from the food, but could be also made from some amino-acids and carbohydrates.

Muscles in motion are not capable to use directly the neutral fats (glycerids) so they use instead lipoids, glycerin and fatty acids. Fats through oxidation release more energy than proteins and carbohydrates i.e. 1 gram of fat releases 9.3 calories, which represents an important fact for the diet of sportsman.

Fats are slower assimilated by the digestive system than other nutritional components. They remain for a long period in the stomach where only milk fats are digested in part, while the remaining fats are digested in the small intestines under influence of intestinal and pancreas juices. The melting point also plays an important part in the assimilation of fats, i.e. the higher the melting point, the more difficult are the fats assimilated.

The best source of fats are butter and vegetable oils (olive, sunflower, and linen) while pork, sheep and veal fat come into meals only as components of coldcut products. According to the physiological norms the daily quantity of fats should make approximately 25% of the total caloric diet value during 24 hours. Many sportsmen would like to increase the quantity of fats in daily meals but this is not good. Is the fats are taken in increased quantities, in particular during the training period, neutral fats are deposited in the liver in place of glycogen which is needed under stress. This may lead to less successful sporting achievements.

Vitamins

Vitamins are substances regulating the body metabolism. It has been established up to now that they increase the working capabilities and influence the efficiency of the sports training.

Over 40 vitamins are known today the most significant among them being A, B1, B2, C, PP, D and E.

Vitamin A contributes to the improvement of eyesight and accelerates healing of the skin wounds.

Deficiency of the vitamin B1 is may cause disturbances of the nervous system functions leading to more rapid fatigue, while the vitamin B2 influences the proper work of digestive organs and it enables quick healing of eye and skin lesions.

Vitamin C is important for a sportsman because it refreshes the body, lifts the fatigue and strengthens the resistance of the body to infection, while the vitamin PP contributes to the proper function of digestive organs.

Deficiency of vitamin D affects skeletal system, while vitamin E contributes to the muscle metabolism.

Deficiency of vitamins in the organism of a sportsman leads to metabolic disturbances during the muscle work-out and in this way reduces the efficiency of the exercises, while the increased quantity of vitamins affects favorably the sports achievements.

Mineral substances

Minerals belong among substances which support and improve the body functions preparing it for physical exertions. The diet of sportsman must include, first of all, sodium, potassium, magnesium, phosphorous and iron, elements which participate in the body metabolism and can be found in various foods. Their deficiency leads to the disturbance of the flow of physiological functions and leads to the development of pathological processes.

Basketball is a sport where the variations of the body mass are frequent and may happen very rapidly, depending on the period and the exercise load. When losing the body mass, in order to regain it, sportsmen must base their diet on carbohydrates (bread, pasta, sweets etc.). In order to reduce the body mass the diet should contain predominantly vegetables, fruit, milk products and a decreased quantities of proteins and vegetable fats. Obesity in basketball players causes inertness, slows the coordination and decreased moving ability, while the decreased body weight results in evident fatigue and poor jumping ability.

Water

Water is without any doubt the most important constituent of the human body. Human body can only with difficulty endure diminished water intake or its deficiency. A man can live without food up to 30 days, but hardly 4 days without water.

Food has high water content. For example, fruit and vegetables contain about 85% of water, meat about 70% of water etc. The water from the human body is eliminated in several ways, trough exhalation of air, trough skin i.e. the sweat glands and kidneys. In 24 hours the human body eliminates approximately 2.5 l of water that has to be replenished by intake of food and drink.

Deficiency of water in organism causes various pathologic conditions which are manifested in form of disturbed metabolism, heavier heartbeat, fatigue etc.

Important is not to allow the body to dehydrate i.e. one must drink before, during and after physical exertions. The intake of the liquid should be continual.

In basketball, during the time-out, liquid must be taken in sips not gulps. Intake of liquid in gulps causes a large quantity of air to enter the stomach (aerophagia) which causes stomach convulsions. For that reason the use of carbonated beverages is nor recommended. The best beverage is pure water at 10°C which is absorbed by intestines more rapidly than the water at room temperature.

Doping

Modern sports, including also basketball, demand great training exertions. Because of that in many sports, training is performed 2-3 times a day, and this causes use of supplementary agents capable to increase the work effects of a sportsman during the training and to speed up the recuperation after hard exercises.

Recuperation in a sport is process of normalization of the body functions, renewal of energy proving substances and processes which take place after the completed muscle activities. Each of these processes does not only enable the recuperation of the labor capabilities of the body but also contributes to its temporarily increase. Proportional to the

intensity and load volume, the recuperation plays a significant role in augmentation of the effects of training a sportsman.

It is our opinion, that medical and biological recovery means are most important in sport. These agents increase the body resistance, speed up the elimination of fatigue and due to that must be used properly. The complex of these means includes regular sporting diet which substitutes the consumed energy, as well as supplementary agents which support protein synthesis and optimization of the balance vitamins and acids & bases. As the third component the sportsmen can use various means of the physical therapy to help the body recuperation.

The most important for the diet of the sportsman is that daily caloric value of the food corresponds to the daily energy consumption (5,500 Cal). In order to for the sports diet to be optimal, a proper ratio between the main nutrient component must be achieved i.e. proteins, fats and carbohydrates (1:0.8 - 1:4). That ratio can vary some depending on the sporting branch. The important element for rapid body recuperation is its full saturation with minerals, in particular with salts.

The provision of vitamins is important at all load stages and they must be administered under supervision of the physician.

Top sports require physiological, permitted means to be used for faster recuperation of a sportsman. These means should function in the following way:
1. to reinforce the albumen synthesis
2. to influence the energy processes and
3. to influence the transfer of nerve impulses and contraction of skeleton muscles and the cardiac muscle.

Among physiological agents one has to mention in the first place the monovitamine and polyvitamine preparations. The single vitamins necessary for sportsmen are A, B1, B6, B12, B15, C, D, and E and as polyvitamine preparations all those which contain the mentioned vitamins.

The most important minerals are magnesium, iron, potassium, calcium, sodium-chlorine and phosphor. There is no doubt that all these agents have its role in the body of the sportsman, but their use and dosage as well as use of all pharmacology agents and pother processes must be determined only by a doctor.

Some special pharmacological means are increasingly produced in the world and recommended as permitted agents for the improvement of the physical strength and recovery after exertions with suggestion that they are faster acting and better than "this and that" other preparation. It is possible that there is some truth in it, but in most cases the purpose of these products is financial gain for the laboratory or plant of the manufacturer. There are however physiological agents which are tested in detail and which effects are documented.

According to this, all agents used by the sportsman for the purpose of recovery must be well tested, and only the doctor, in consultation with the coach who determines the load of the sportsman, is the person competent to prescribe agents to be used by the sportsman.

The use of doping in sports in motivated by multiple interests, commercial as well as national prestige. The methods used are very different from the standpoint of their effects as well as ideas which occur to sportsman, their coaches, and, regretfully, some physicians.

Since the natural, physiological training methods are almost exhausted and do not give always the expected result, the sportsmen in order to achieve corporal, technical and physiological top, use other artificial means, which them, if possible, without much effort bring in so called victory form. These artificial means are pharmacological substances for the improvement of sporting achievements which are normally not used, or not used in such doses. From biological aspect the doping is considered to be unnatural and, under certain circumstances, life risk bringing way to the achievements. It is contrary to any notion of sports fair play, because all sportsmen should compete under identical conditions.

How can we stand against the expansion of doping?

The great progress of analytical methods in discovering doping substances was very helpful in discovering such agents. However, the threat of punishment here, as anywhere in the world, " is just a lath fence, which has never prevented the fall of the delicate tree of a moral." (Neumann). Much more effective is proving to young people, who still have a feeling for this, that it is miserable to dirty up the competition with deceit. It is questionable however, if young people are involved in sports only because of money, can abstain from using medicaments, in spire of the warning of their harmful effects.

"Usage of doping substances is harmful for the health. It is not fair towards coach (unless he gave it to the sportsman himself!), towards the doctor who takes care about his health, and towards the public which wants to watch fair sporting competition, and not the superiority of one competitor vis-a-vis another".

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DIET

Suggested menu for the game day

· *If the game is before noon:*
Breakfast: tea, milk or white coffee, 2 pieces of bread or toast, butter.
Lunch may be at choice.

· *If the game is in the afternoon the above breakfast may be supported by one of the following victuals:*
Yogurt, 75 gr. of ham or 50 gr. of young cow cheese, or ham and eggs, omelet, or 2 soft-boiled eggs
Lunch (at least three hours before the competition):
Soup or spaghetti Milanese, or rice;
grilled meat (beef, mutton, veal), or cooked chicken;
cooked potatoes, or mashed potatoes, or baked potatoes, or well drained French fries;
Salad: red beet, or tomato, or lettuce, or cabbage, or green pepper;
Sweets: compote or vanilla cream;
Drink: before competition water or natural juice, and after the competition mineral water.

AVOID: cucumber, sour green pepper, onion and garlic, any carbonated beverages except mineral water.

Menu for entire day (12 hours)

Bread 350 gram
Milk 500 gram
Meat 300-400 gram
Vegetables 200-300 gram (meals and salad)
Ham 70 gram
Eggs 2
Butter 30 gram
Yogurt, sour milk 200 gram
Young cow cheese 80 gram
Potatoes 120 gram
Fruit juice - CO2-free 300 gram
Honey 15 gram
Pasta 50 gram
Fish 175 gram
Fresh fruit 400 gram
Jam 15 gram
Oil 15 gram
Oat flakes 50 gram