Physiologically healthy nutrition, the importance of proteins.

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ABSTRACT

Physiologically healthy nutrition is a balanced and proper nutrition system in accordance with the natural needs of the human body. This nutrition method ensures a healthy life by providing the body with a sufficient amount of energy, nutrients and vitamins.

Keywords: Proteins, protein metabolism, hemoglobin, physiological nutrition, balanced and proper nutrition,.energy, vitamin proteins, fats, carbohydrates, vitamins and minerals, balance

Physiologically healthy nutrition is a balanced and proper nutrition system in accordance with the natural needs of the human body. This nutrition method ensures a healthy life by providing the body with a sufficient amount of energy, nutrients and vitamins.

Basic principles of physiologically healthy nutrition

1. Balanced nutrition. Food should contain proteins, fats, carbohydrates, vitamins and minerals in sufficient quantities. If this balance is maintained, the body functions normally and diseases are prevented.

2. Daily calorie needs. A person's daily calorie needs vary depending on age, gender, physical activity and health. For example: the average adult should consume around 2000–2500 kcal per day. For people who play sports, this amount may be higher.

3. Proper nutrition. The time and order of meals are important:

Breakfast is a source of energy and is considered the most important meal. Lunch is the main meal, providing the body with the necessary nutrients. Dinner should be light and should be eaten at least 2-3 hours before bedtime. Snacks in between - fruits, nuts or healthy snacks are recommended.

4. Consumption of natural and high-quality products. Artificial additives and

processed products should be avoided, fresh vegetables, fish and meat products should be consumed.

Following these principles is important for the proper functioning of the body, the prevention of diseases and maintaining general health. Based on science, proper nutrition is the most important factor ensuring a person's health and working capacity. Food should fully cover the energy expended by a person and provide all plastic processes. Each person needs a certain amount of nutrients, depending on age, body mass, gender, work performed and the characteristics of the surrounding environment. Nutrients include proteins, fats, carbohydrates, mineral salts and vitamins.

These nutrients are obtained by a person in the form of food and water. Now the composition and number of calories in food products have been well studied, and accordingly, the daily need for nutrients can be calculated. A good diet that suits everyone depends on the following: firstly, on the amount of nutrients in terms of calories needed for energy needs; Secondly, it depends on the qualitative composition and ratio of various nutrients necessary for the normal life of the organism. As mentioned above, the amount of energy needed is determined by the amount of basic metabolism and the work performed.

The less intense the work, the more nutrients are needed. During a certain physical exertion, both a decrease and an increase in the norm are harmful to the organism. In the first case, substances in the structure of cells and tissues are consumed to generate energy, and the person loses mass, becomes exhausted and ceases to function. In the second case, excess nutrients, mainly in the form of fats and partly carbohydrates, accumulate in the tissues. If, in addition to an excess of calories, a person lives a life of little movement, this leads to obesity, the onset of changes in the body and, as has now been proven, premature aging of a person [1.2.3]

Proteins, or proteins, are complex, high-molecular organic compounds consisting of amino acids. They constitute the main, essential part of all tissues and cells in the body of animals and plants, that is, without them, vital physiological processes cannot be carried out. Proteins differ in their composition and properties in different animals and plants, and even in different cells and tissues of the same organism. Proteins with different molecular compositions dissolve differently in water and aqueous salt solutions, but do not dissolve in organic solutions. Since the protein molecule contains acidic and basic groups, they have a neutral reaction. Proteins form various compounds with all chemical substances, which makes them important in the implementation of chemical reactions that occur in the body and determine the manifestation of all vital phenomena, as well as in its protection from harmful effects.

Proteins are a component of proteins, enzymes, antibodies, hemoglobin, myoglobin, many hormones, and form complex complexes with vitamins. Proteins can be broken down into fats and carbohydrates in the body, combining with them. In the animal body, they are synthesized only from amino acids and their complexes - polypeptides, but not from inorganic compounds, fats and carbohydrates. Outside the body, a large number of low-molecular biologically active protein substances are found in the body and are very similar to them, for example, some hormones are synthesized. [1].

It is known that amino acids are formed from amino acids, and they are a source for the synthesis of structural proteins, enzymes, hormones of a protein and peptide nature, and others, as well as a source of energy. During the day, 400 g of proteins are broken down and synthesized in the human body. Approximately two-thirds of the free amino acids formed as a result of the breakdown of oxalate are used for the synthesis of new oxalate, but one-third is irreversibly oxidized in energy chains and must be replenished with exogenous amino acids from food. Each species of animal has its own set of oxalates. However, despite the great variety of

protein structures, their structure consists of only 20 combinations of amino acids. 10 of these amino acids are synthesized by the body from other amino acids, that is, they are considered replaceable amino acids.

There are another 10 amino acids that are not synthesized in the body of humans and higher animals, and they must necessarily enter the body with food, that is, they are considered irreplaceable amino acids. The designations of essential and non-essential amino acids only indicate the need to include these amino acids in the diet, but do not indicate their importance for the body. For growing rats, calves, and pigs, the essential amino acids are alanine, aspartic acid, glutamic acid, glycine, proline, hydroxyproline, serine, tyrosine, cysteine, and cystine, while the non-essential amino acids are arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.

Protein sources - meat, fish, eggs, milk and dairy products.Plant sources: legumes (beans, peas, lentils), nuts and cereals. Proteins are one of the most important substances necessary for the body, and if not consumed in sufficient quantities, they can lead to a decrease in muscle mass, a decrease in immunity and a general weakening of the body.

Energy in the body is produced by the breakdown and oxidation of proteins, fats and carbohydrates. From a purely energetic point of view, it would be irrelevant which of these three groups of substances is used to produce energy, since all of these substances are oxidized in the body to the final products (C 0 2 , H 20 and simple nitrogenous compounds) that are excreted from it. However, it turned out that it is impossible to replace one with the other in this way, because in order to ensure plastic processes, all nutrients must be in a certain qualitative composition and in a certain quantitative ratio to each other. First of all, this applies to proteins. It was said above that for an adult there should be a certain protein minimum, that is, protein should be supplied in such an amount that the nitrogen balance is still maintained. However, as is known from experiments and statistics, when compiling a diet, it is necessary to aim not at the minimum protein content, but at the optimum protein content, that is, at a higher amount of protein that fully determines the needs of the body and good working capacity. It has been established that the daily need for protein for an adult during light work is 80-100 g, and during somewhat heavier physical work it is from 120 to 160 g.

The norm of proteins for children is determined depending on their age, but when calculated per 1 kg of body weight, this norm is much higher than the norm intended for adults, since biosynthetic processes are intense in a growing organism, tissues and organs grow. For the normal functioning of the body, proteins must not only be present in a certain amount, but also in a certain composition.

The diet should contain all the essential amino acids, and the other amino acids should be in optimal proportions with each other, in sufficient quantities. When a person usually eats mixed foods, proteins will meet these requirements in terms of amino acids, but at least 30% of the proteins in the diet must consist of animal proteins. It was mentioned above that these animal proteins - meat, fish, eggs and dairy products - are the most biologically valuable proteins for humans. Accordingly, animal proteins must necessarily be included in the diet of people of all ages, including, according to modern concepts, people who are already old. Energy of nutrients. By now, the concept of balanced nutrition has been formed. According to this concept, the amount of food consumed should correspond to the energy expended by people. In other words, a certain level of energy balance must be constantly maintained in nutrition.

The energy value of 1 g of carbohydrates is on average 17220 joules, while 1 g of fat is 39069 joules. Knowing the energy value of consumed proteins, fats and carbohydrates, it is possible to calculate the calorie content of people's diets, which is important in organizing rational nutrition.

Nutritional norms. Usually, when compiling a diet, the calorie content of consumed nutrients is taken into account. However, this alone is not enough to organize full-fledged nutrition.

It is important that food contains all the necessary nutrients for the body (proteins, carbohydrates, fats, water, minerals and vitamins). The ratio of nutrients in the diet is also important. For children of primary school age, the optimal ratio of proteins to fats and carbohydrates is 1:1:6, for children of kindergarten age it is 1:2:3, and for adults the ratio is 1:1:4. The table shows the daily norms of proteins, carbohydrates and fats necessary for organizing the rational nutrition of children of different ages. When drawing up children's diets, it is necessary to pay special attention to providing their bodies with vitamins and minerals. When children are fed with mixed foods, their bodies receive a variety of amino acids. vitamins, because they increase the value of food. A variety of foods stimulates appetite, causes a large amount of secretion of digestive juices and ensures good assimilation of food. Meals should be sufficient in volume and caloric content, that is, they should cause a state of satiety and compensate for all energy costs of the body. The mass of consumed food should be 2000-2600 g per day, depending on the age of the consumer. Nutritional regimen: The concept of "rational nutrition" includes not only the quantity and quality of consumed food, but also the correct order of consumption, that is, the division of the daily diet into time periods. When eating twice a day, products lose their nutritional and biological value, as a rule, children tolerate long breaks in feeding very poorly.

When eating too often, nutrients are not digested, and children lose their appetite. The most convenient feeding is 7 times a day until the age of two months, 6 times from 3 to 5 months, and 5 times from 5 months to 1 year. It is advisable for schoolchildren to eat 4 times a day. The break between meals according to this feeding regimen should not exceed 6 hours. It is advisable to eat meals at the same time every day, because in such cases, conditioned reflexes can be formed, and the stomach secretes digestive juice that ensures good digestion. Children's morning breakfast should be nutritious and should make up 25% of the daily diet.

The second breakfast is served at school and should make up 20% of the diet. A hot breakfast at school should contain 15-30 g of protein, 15-20 g of fat, and 80-100 g of carbohydrates. Typically, lunch should make up 35% of the daily diet, and dinner should make up about 20%. It is recommended to eat meat and fish dishes in the first half of the day, as they are rich in extractive substances and have a stimulating effect on the nervous system. In the evening, it is recommended to eat dairy and vegetable dishes. It is recommended to include 1/3 of the consumed diet in the form of proteins and fats in the form of animal products. Proteins are very important nutrients for the human body.

They play a major role in strengthening muscles, bones, and immunity. The need for proteins in each age group is different. Infants grow quickly, so their body needs more protein. Protein strengthens children's bones and muscles, boosts their immune system, and helps with mental development. The best source of protein is breast milk. Yogurt, eggs, and meat are also good for babies.

Protein for middle-aged people Between the ages of 18 and 50, people lead active lives, so protein is important for maintaining muscle and providing energy. Protein is also important for metabolism and preventing weight gain. Chicken, fish, eggs, dairy products, and legumes are good sources of protein.

Protein for the elderly As we age, muscles weaken and bones become brittle. Protein helps slow down this process. It also strengthens the immune system and helps the body recover faster from illnesses. The best sources of protein for the elderly are lean meat, fish, eggs, yogurt, and legumes. It is important to consume enough protein to stay healthy at any age. Protein deficiency can lead to weakness of the body,

decreased immunity, and muscle weakness. Therefore, it is necessary to include protein-rich foods in your diet.

1st week diet plan table 1

Day	Breakfast			Lunch			Dinner		
1	Bread 1 slice Protein 6.81g Fat 0.54g Carbohydrates 57.80g	Butter 100g Protein-1.07g Fat 86.57g Carbohydrate 0.6g	Tea	Bread 200g Protein-13.62g Fat-10.80g Carbohydrate-115.6g	Mashed potatoes-100gr Protein-28gr Fat-3.2 Carbohydrates-18.8gr	Salad Protein-15.8 Fat-22 Carbohydrate-2.38	Bread-200gr Protein-13.62gr Fat-10.8gr Carbohydrate-115.6gr	Bread-200gr Protein-13.62gr Fat-10.8gr Carbohydrate-115.6gr	Broth-50gr Protein0.15gr Fat-0.15gr Carbohydrate-0
2	Bread-200gr	Cream-100gr	Chocolate-	Bread-100gr	Meatless Cabbage Soup	Tomato and Cucumber	Bread-100gr	Eggs-2 100g	Boiled sausage
	Protein-13.62gr	Protein-3.01gr	100g	Protein-6.81gr	Protein-8gr	Protein-2.04gr		Protein-12.55g	Protein-14.15gr

3.	Bread-1 slice	Walnut	Honey	Bread-1 slice	Shovla	Liver-100gr	Bread-200gr	Meat soup	Salad
4	Protein-6.81gr Fat-0.54gr Carbohydrate-57.80gr	Protein-13.80gr Fat-48.17gr Carbohydrate-10.69gr	Protein-4.2gr Fat-0 Carbohydrate-79.89gr	Protein-6.81gr Fat-0.54gr Carbohydrate-57.80gr	Protein-9.4gr Fat-6.8gr Carbohydrate-28.6gr	Protein-19.38gr Fat-4.65gr Carbohydrate-2.08gr	Protein-13.62gr Fat-1.08gr Carbohydrate-115.6gr	Protein-7gr Fat-12gr Carbohydrate-30gr	Protein-2gr Fat-0.5gr Carbohydrate-5gr
5	Bread-200gr Protein-13.62gr Fat-1.08gr Carbohydrate-115.6gr	Coffee Protein-1gr Fat-0.2gr Carbohydrate-05gr	Potatoes-500gr Fat-5gr Fat-25gr Carbohydrates-70gr	Bread-200gr Protein-13.62gr Fat-1.08gr Carbohydrate-115.6gr	Lean beef - 200g Protein - 36.76g Fat - 42.8 Carbohydrates - 0	Semetana-100gr Protein-4.34gr Fat-26.23gr Carbohydrate-1.72gr	Bread-100gr Protein-6.81gr Fat-0.54gr Carbohydrate-57.80gr	Fried fish-100gr Protein-22gr Fat-12gr Carbohydrate-2gr	Semetana-100gr Protein-4.34gr Fat-26.23gr Carbohydrate-1.72gr
6	Raisins-100gr Protein-2.52gr Fat-0.59gr Carbohydrate-69.66gr	Bread-100gr Protein-6.81gr Fat-0.54gr Carbohydrate-57.80gr	Walnut Protein-13.80gr Fat-48.17gr Carbohydrate-10.69gr	Bread-200gr Protein-13.62gr Fat-1.08gr Carbohydrate-115.6gr	Chicken Protein-19.84gr Fat-5.10gr Carbohydrate-1.07gr	Tomato and cucumber Protein-2.04gr Fat-0.3gr Carbohydrate-6.2gr	Bread-200gr Protein-13.62gr Fat-1.08gr Carbohydrate-115.6gr	Pasta-100gr Protein-10.88gr Fat-0.62gr Carbohydrate-25.55gr	Green peas-100gr Protein-25.78gr Fat-3.78gr Carbohydrate-52.99gr

Protein metabolism disorders. A conclusion can be drawn about quantitative changes in protein metabolism by studying the nitrogen balance. To do this, they compare the amount of nitrogen-containing

substances entering the body with food and leaving the body. Nitrogen balance is established when the amount of nitrogen entering and leaving is the same. In many diseases, especially in febrile diseases, metabolism increases sharply, oxidation processes intensify. The excretion of end products of protein metabolism increases, and the nitrogen balance becomes negative. Analysis of nitrogen-containing substances in the urine shows that in fever, in addition to the usual breakdown of proteins, the breakdown of complex proteins contained in the cell nucleus is also observed. In this case, the increased excretion of uric acid and creatine seeks to replace the lost nitrogen, and its excretion temporarily decreases. In the short term, the positive nitrogen balance increases. Negative nitrogen balance is always observed after blood loss, burns, malignant tumors and poisoning.

The nature of the protein metabolism disorder is also determined by the content of nitrogenous substances in the blood. To do this, the amount of nitrogen in non-protein substances of the blood is determined - residual blood nitrogen. Proteins are precipitated with precipitants. The main amount of residual nitrogen is urea. In addition to urea, substances that give residual nitrogen include uric acid, creatinine and other products of protein breakdown. The study of the nature of protein metabolism disorders is also facilitated by the identification of various types of proteins in the blood. Protein dystrophies (dysproteinoses). Protein metabolism disorders lead to changes in the composition of tissues and their cells - protein dystrophies.

There are several types of protein dystrophies associated with various disorders of protein metabolism. Some of them are expressed in changes in intracellular proteins, while others are expressed in changes in extracellular tissue proteins. Cellular dysproteinoses.

In cellular dysproteinoses, cells acquire a different physical, chemical and morphological appearance compared to the protein norm. Of the cellular dysproteinoses, granular and hydrophilic dystrophies are more important. Granular dystrophy is characterized by the appearance of large grains in the cell protoplasm of parenchymatous organs. The cells appear swollen. In this case, changes in the structural properties of their proteins are determined by the grains and droplets formed in the cell protoplasm. In granular dystrophy, mitochondria are severely damaged, swelling and vacuolization occur in them.

Granular dystrophy is clearly and clearly visible in the convoluted tubules of the kidneys, liver cells, and heart muscle. In this dystrophy, the organs increase in size somewhat and become loose. On the cross-section, it has a grayish tint, as if it had been splashed with boiling water. Granular dystrophy occurs in various intoxications, infectious processes, and circulatory disorders. Their direct cause is a decrease in oxidative processes, impaired cellular respiration, and the accumulation of acidic metabolic products. In granular dystrophy, the function of parenchymatous organs decreases. It leads to a weakening of the contractile ability of the heart muscle. Granular dystrophy of the epithelium of the convoluted tubules of the kidney leads to a violation of the filtration ability of the epithelium and the appearance of protein in the urine.

The consequences of granular dystrophy are diverse. This process is usually reversible, and when the cause that caused it is eliminated, a full recovery of the composition is observed. Hydrophilic dystrophy occurs due to a violation of protein and water metabolism. It is observed with various intoxications, infectious diseases, swelling of organs (skin, kidneys). Due to a change in oncotic pressure in the cell protoplasm, water-retaining vacuoles appear. The process can be reversible, but most often ends with the death of cells. Hyalinosis or hyaline dystrophy occurs in the connective tissue and in the walls of blood vessels.

The name of this dystrophy is associated with the appearance of a homogeneous mass in the interstitial substance, translucent and very dense, resembling a hyaline mass in appearance. The term hyalinosis combines several different processes that actually lead to one type of change. Hyalinosis of

connective tissue can be the result of fibrinoid deposition, that is, the breakdown of collagen fibers and the fusion of the protein mass into a homogeneous dense mass. Such a widespread process occurs in collagen diseases. Local hyalinosis of connective tissue is observed in scars developing after inflammation, in fibrous adhesions, and in the stroma of tumors. As a result of hyalinosis, the structure of the vascular wall is disrupted, the vessels turn into tubes with hard walls and excessively filled cavities and lose their ability to contract. Such changes in the vessels affect blood circulation and often lead to severe circulatory disorders.

Amyloidosis, or amyloid dystrophy, is associated with a profound violation of protein metabolism. In amyloidosis, there is a progressive accumulation of solid protein masses in the intercellular substance of organs, resembling hyaline cartilage in appearance, but differing from it in chemical composition. A hundred years ago, Birkhoff, observing this type of dystrophy, named it amyloidosis based on the fact that amyloid, like starch, turns blue under the influence of fat and sulfuric acid.

This reaction is used by pathologists to diagnose amyloidosis during autopsy. Amyloid deposition is usually observed in the walls of small blood vessels and capillaries, along the direction of reticular fibers, in reticular tissue, and under epithelial cells in glandular organs. As a result of amyloid deposition, the parenchyma of the organ gradually collapses and disappears. Especially dangerous is amyloidosis of the kidneys and liver, since it often leads to dysfunction of the affected organ and death of the patient. With a large accumulation of amyloid, the organ becomes hard and brittle, and its tissue is anemic. On section, such organs have a characteristic waxy or fatty appearance.

The outcome of general amyloidosis is considered poor. However, experimental data, as well as clinical and pathological-anatomical observations, indicate that amyloid masses can dissolve if the causes that caused amyloidosis are completely eliminated and amyloidosis does not reach a high degree. Therefore, it is necessary to identify the cause of amyloidosis and eliminate it[3].

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