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PHYSIOLOGICAL NORMS AND ECOLOGICAL PROBLEMS OF HUMAN NUTRITION

ФІЗІОЛОГІЧНІ НОРМИ ТА ЕКОЛОГІЧНІ ПРОБЛЕМИ ХАРЧУВАННЯ ЛЮДИНИ

Prylipko T.M. / Приліпко Т.М.,
d.a.s., prof. / д.с.н.. проф.
ORCID: 0000-0002-8178-207X
Publons: AAF-5445-2019
Koval T.V., / Коваль Т.В.
c.a.s., as.prof. / к.с.н., доц.
ORCID: 0000-0002-7132-5887
Higher education institution « Podolsk State University», Kamianets-Podilskyi, Shevchenko,13,32300 Заклад вищої освіти «Подільський державний університет»

Abstract. *The main condition of natural nutrition is that all products are as environmentally friendly as possible: without radionuclides, heavy metals, harmful organic substances (pesticides, nitrates, etc.). It is extremely important for the human body to consume clean drinking water, the state of human health depends on its structural features (according to the World Health Organization, up to 80% of human health problems are related to water quality). Drinking water must be natural, have a balanced content of all inorganic substances necessary for the human body. In addition, it should not be chemically and bacteriologically contaminated. People's diet should consist of a sufficient amount of proteins, fats, carbohydrates, and vitamins in the correct ratio and of proper quality. Proteins - complex organic substances - are especially important for the functioning of the body. A lack of fat in the diet causes disturbances in the functioning of the central nervous system, reduces the activity of protein synthesis, and weakens the body's protective functions. Rational nutrition not only provides the body with energy, elastic substances, mineral salts, vitamins, water, but also with biologically active substances. Knowledge of their energy value, chemical composition of products is a prerequisite for a balanced diet.*

Key words*: proteins, rational nutrition, diet, human body, vitamins, mineral salts.*

Cells, tissues and organs of the body continuously consume substances in the process of vital activity. What are included in its composition, the deficiency of which it can compensate with food. Therefore, the rational organization of a person's diet is one of the most important conditions that determine his state of health, life expectancy, and working capacity. Nutrition provides the body with the necessary substances for building tissues and organs, maintaining body temperature, and performing vital functions[2].

In its essence, rational nutrition is about ensuring the body's energy balance - the balance between the energy that comes with food. And the energy that a person spends in the process of life. From a scientific point of view, a person should adhere to the following basic principles of natural nutrition: 60-70% of the daily diet of a healthy person should consist of non-denatured (not devoid of natural qualities) products of plant origin (fresh, dried or frozen); limiting the use of products of animal origin (meat, fish, eggs), consuming them without bread or potatoes, with a large amount of vegetables; refusal of whole milk, consumption of high-fat sour-milk products; limiting the use of salt, sugar, and carbohydrate-rich products (white bread, pasta, potatoes, pastries, etc.) [8,9].

In order to preserve the biological value and life-giving energy of food products, especially vegetables, fruits, and cereals, they should be subjected to heat treatment or

any other method of denaturation as little as possible. It is advisable to start eating with raw fruits, giving preference to apples. In the absence of fresh vegetables, it is replaced with dried fruits (dried in the sun), from which compotes and concoctions can be prepared [9].

It is better to eat fruits separately from other products. After 20-30 minutes, you can start eating fresh raw vegetables (vegetables). These can be natural vegetables or salad compositions dressed with oil, sour cream, mayonnaise. After that, it's time for the main course. It is useful to add sunflower seeds or sprouted grains of rye, wheat, barley, etc. to salads and porridge. It is recommended to drink water or other drinks 30 minutes before a meal or 1-1.5 hours after it [8].

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People's diet should consist of a sufficient amount of proteins, fats, carbohydrates, and vitamins in the correct ratio and of proper quality. As you know, the human body consists of proteins (19.6%), fats (914.7%), carbohydrates (1%), minerals (4.9%) and water (59.8%). In the process of functioning, it constantly loses these components for the formation of energy, necessary for ensuring vital processes, physical and mental work. Restoration, creation of cells, tissues, and energy occurs at the expense of substances that come with food. Therefore, it is important to know not only the calorie content of products, but also their substance composition [2].

A person engaged in intellectual work spends 3000-3200 kcal of energy during the day, representatives of professions of heavy physical labor spend a little more energy[1].

Proteins - complex organic substances - are especially important for the functioning of the body. Containing amino acids, the composition of which includes carbon, hydrogen, oxygen, nitrogen, phosphorus (the main biophiles that make up the human body). They are the main plastic material for the construction of human cells, tissues, and organs, participate in the formation of enzymes, hormones, and promote normal metabolism in the body.

Regulation of the acid-alkaline balance of tissues and colloid-osmotic pressure is related to proteins. They affect the process of excitation of the cerebral cortex, stimulate conditioned reflex reactions and functions of endocrine glands, ensure the processes of reproduction and growth. They have protective properties. A diet containing an increased amount of proteins (24-40% in terms of energy value) increases the radioresistance of the body and limits its absorption of cesium and strontium [5].

Proteins are the main component of diets, and it is impractical to replace them with other components (carbohydrates, fats) that do not contain nitrogen. The energy value of 1 g of protein is 4.1 kcal[4].

For the synthesis of protein in the body, a sufficient amount of it in food (of a certain amino acid composition) is necessary. According to their biological value, amino acids are divided into replaceable and irreplaceable. The nutritional value of protein depends on the content of essential amino acids. Complete proteins are found in products of animal origin (meat, fish, eggs, milk, dairy products), legumes and cereals (wheat, oatmeal, rice). For complete assimilation of proteins, it is necessary that they be in the correct ratio with other food substances, primarily with carbohydrates, fats and vitamins. The assimilation of proteins is significantly increased by eating them with vegetables and fruits.

Deficiency of proteins in the body causes dystrophy (disruption of nutrition of tissues and organs, which leads to exhaustion of the body), which results in various diseases [6].

Fats are one of the main sources of energy produced in the body. They are characterized by versatile and very complex physiological actions. Having a high calorific value, fats during oxidation in the body release 2.5 times more energy than carbohydrates or proteins. They also have lipot oil action. A certain amount of fat is part of the cytoplasm and cell membranes and is not consumed even during starvation and significant physiological stress.

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Fat is part of the cells and tissues of the body. The energy value of 1 g of fat is 9.3 kcal. They supply his body with vitamins A and D, as well as biologically active substances. Excess fat is deposited in the subcutaneous adipose tissue. A lack of fat in the diet causes disturbances in the functioning of the central nervous system, reduces the activity of protein synthesis, and weakens the body's protective functions[1].

Carbohydrates play an important role in the metabolism. They are the main source of energy necessary for muscle activity. The energy value of 1 g of carbohydrates is 4.1 kcal. The main food products that contain carbohydrates are sugar, potatoes, cereals, and vegetables. Carbohydrates are a part of body cells, they are in blood, liver (glycogen). An excess of carbohydrates in the body causes obesity, if they are insufficient, energy is generated from stored fat[4].

Therefore, rational nutrition not only provides the body with energy, elastic substances, mineral salts, vitamins, water, but also with biologically active substances. Knowledge of their energy value, chemical composition of products is a prerequisite for a balanced diet.

At the same time, various poisonous substances and infections can enter the human body with food [2, 3]. (Table 1).

Proper organization of the diet during the day, rational selection of products is important. Nutritionists offer [7] many different recommendations, nutrition systems.

Table 1 - Diseases transmitted through food products

Product groups food	Diseases transmitted through certain food groups
Meat, meat products	Intestinal infections (cholera, dysentery, typhoid, paratyphoid A and B); abdominal toxic infections caused by Salmonella; food poisoning (botulism, staphylococcal toxicosis); tuberculosis, brucellosis, anthrax, foot and mouth disease; helminth infections (trichinellosis, echinococcosis)
Milk, dairy products	Intestinal infections (cholera, typhoid, dysentery, paratyphoid A and B); food toxic infections caused by salmonella (staphylococcal toxicosis, scarlet fever, diphtheria, hepatitis, poliomyelitis, tuberculosis, brucellosis, foot-and-mouth disease, anthrax, ku-fever)
Fish, fish products	Intestinal infections (cholera, typhoid, paratyphoid A and B, dysentery); food toxic infections caused by salmonella; food poisoning (botulism, staphylococcal toxicosis); food poisoning of a non-microbial nature with roe and milt of fish (marinka, barbel, pinbelly) and liver, roe, milt of fish during the spawning period (pike, mackerel); food poisoning of unknown etiology (alimentary paroxysmal-toxic myoglobinuria caused by lake fish in some years); helminthiasis (diphyllobotryosis, olistorchosis)
Vegetables. fruits	Food toxic infections caused by salmonella; food poisoning with chemical impurities (poison chemicals, arsenic, mercury, cadmium, manganese, selenium, fluorine, etc.); compounds from water and soil; lead; intestinal infections (cholera, typhoid, paratyphoid A and B, dysentery); helminthiasis (ascariasis, trichocephalosis)

Undoubtedly, each person can take advantage of them to a certain extent, adapting them to their lifestyle, living conditions, following the following universal rules: consume simple, mostly plant-based food; rationally combine products (avoid combining meat, fish with products containing starch, mixing proteins with fats, sour fruits with proteins), etc.; consume no more than one type of protein-rich foods at one time; do not consume starchy food and sweet dishes at the same time; avoid the consumption of milk, and if this is not possible - do not combine it with any dishes (this does not apply to fermented milk products); start eating with the most watery products, ending with the least watery; do not drink anything while eating, it is better to do it 10-15 minutes before eating. After consuming carbohydrates, it is recommended to consume liquid after 2 hours, fats - after 4-5 hours; limit the consumption of artificial and refined products (sausages, cakes, cookies, sugar, etc.), if it is not possible to give them up; go at the same time. Sit down at the table hungry, get up from it with a slight feeling of hunger, do not overeat; minimize the number of meals consumed at one time; do not eat too cold and too hot food; take care of the interior of the room, as well as a positive emotional state during meals; do not sit down

at the table tired, irritated - it is better to relax beforehand, if necessary - take a little rest; maintain a regimen optimal for age and living conditions; if possible, perform special exercises that keep the digestive organs in tone and stimulate their work; you should not go to bed immediately after getting up from the table [1].

Such recommendations are systematically and comprehensively presented in many special publications with various comments. There is also a lot of information about ways to cleanse the body. In general terms, every person needs to know this in order to timely and rationally establish a lifestyle, adjust it, and in certain situations, to be aware of the need for qualified help from specialists and to apply for it in a timely manner. At the same time, it is important to remember that unfounded, amateur enthusiasm for various methods, extremes are no less harmful to the body than disorganization and imprudence in the attitude to one's health.

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Анотація. *Головна умова природного харчування полягає у тому, щоб усі продукти були максимально екологічно чистими: без радіонуклідів, важких металів, шкідливих органічних речовин (пестицидів, нітратів тощо). Надзвичайно важливим є для організму людини споживання чистої питної води, від структурних особливостей якої залежить стан здоров'я людини (за даними Всесвітньої організації охорони здоров'я, до 80% проблем здоров'я людини пов'язані з якістю води). Питна вода повинна бути природною, мати збалансований вміст усіх необхідних для організму людини неорганічних речовин. Крім того, вона не повинна бути хімічно і бактеріологічно забрудненою. Раціон людей має складатися з достатньої кількості білків, жирів, вуглеводів, вітамінів у правильному їх співвідношенні за належної якості. Особливо важливими для функціонування організму є білки – складні органічні речовини. Нестача в харчуванні жирів спричинює порушення у функціонуванні центральної нервової системи, знижує активність синтезу білків, послаблює захисні функції організму. Раціональне харчування не лише забезпечує організм енергією, еластичними речовинами, мінеральними солями, вітамінами, водою, а і біологічно активними речовинами. Знання їх енергетичної цінності, хімічного складу продуктів є передумовою збалансованості раціону харчування.*

Ключові слова: *білки, раціональне харчування, раціон, організм людини, вітаміни, мінеральні солі.*