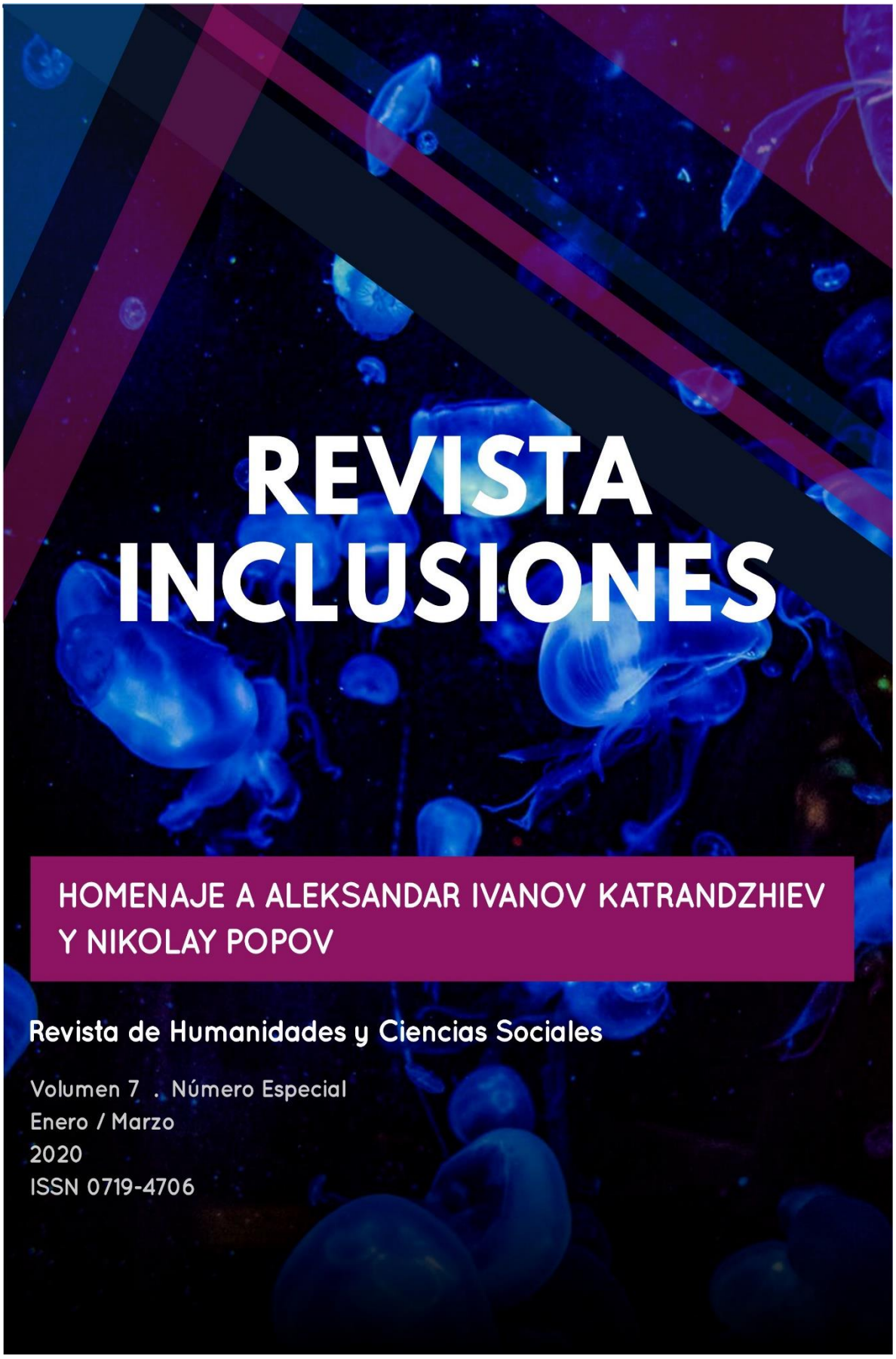

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KEY FEATURES OF HUMAN NUTRITION BEHAVIOR

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Abstract

The importance of nutrition for the human organism cannot be overestimated. It provides all organs with plastic and energetic material and supports viability. Unfortunately, in the developed world nutrition is not always balanced and safe. It is known that in recent years, the average body weight of a person has increased significantly. It provides a framework for establishing the importance of the detailed study of nutrition behavior and the role that the brain plays in it. It has been found that the role of the brain in nutrition behavior is very multifaceted; at the same time the bark and the subcortex both obviously play an important role in this process.

Keywords

Food – Eating behaviour – Brain – Neurotransmitters – Hypothalamus

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Introduction

The functioning of an organism is inextricably linked with the external environment[1] Its effect tones[2], regulates[3], heals[4], and sometimes disrupts the functioning of internal organs and the organism as a whole. The level of activity of all systems of the body and, most importantly, of systems that ensure its integration together depends on the impact of the environment[5].

The importance of nutrition for the human organism cannot be overestimated. It provides all organs with plastic and energetic material and supports viability[6]. At the same time, both its sufficiency and the quality and balance of consumed products is of great importance in the physiology of nutrition. Unfortunately, in the developed world nutrition is not always balanced and safe.

According to experts of the World Health Organization, over the last 20 years, the average body weight of an earthling significantly increased from 73,7 kg in males and from 62,2 kg in females in 1980 to 81,6 kg and 68,8 kg, respectively, in our time[7]. According to the rating results of the American Research Center published in 2017, notably, in Kuwait, the highest prevalence rates of overweight and obesity were 42,8%, in Saudi Arabia - 35,2%, Belize - 34,9%, Egypt - 34,6%, United States - 31,8%, in Russia and the UK - 24,9%. The last places in the ranking are occupied by Bangladesh - 1,1%, Ethiopia - 1,2%, Nepal - 1,5%, Vietnam - 1,6%, Madagascar - 1,7%. According to the data of 2017 given by Federal State Statistics Service (Rosstat) it is shown that in Russia the number of young people aged 16 to 24 who suffer from obesity has increased over 5 years, from 13% to 17%. At the age of 25–39 years, 42% of people are overweight. The largest number of obese Russians over 55 years old - (77%). Among other things, in the diet of Russians, an excess of fat was detected (15,3% more than the average recommended norm), a deficit of protein (by 11,5%) and carbohydrates (by 18,2%). The result of this trend is quite obvious: in a few more decades, and in certain regions of the world, the most threatening diseases of our civilization will become catastrophically common. Such a problem becomes extremely dangerous for countries where the main places in the rations outside

[1] V. B. Simonenko; I. N. Medvedev y V. V. Tolmachev, “Effect of irbesartan of the function of hemocoagulative component of hemostasis in patients with arterial hypertension during metabolic syndrome”, Klinicheskaia meditsina Vol: 88 num 6 (2010): 27-30 y I. N. Medvedev; N. I. Gromnatskii; B. M. Golikov; E. M. Al'- Zuraiki y V. I. Li, “Effects of lisinopril on platelet aggregation in patients with arterial hypertension with metabolic syndrome”, Kardiologiia Vol: 44 num 10 (2004): 57-59.

[2] I. V. Amelina y I. N. Medvedev, “Transcriptional activity of chromosome nucleolar organizing regions in population of Kursk region”, Bulletin of Experimental Biology and Medicine Vol: 147 num 6 (2009): 730-732.

[3] I. N. Medvedev y N. I. Gromnatskii, “The influence of nebivolol on thrombocyte aggregation in patients with arterial hypertension with metabolic syndrome”, Klinicheskaia meditsina Vol: 83 num 3 (2005): 31-33.

[4] S. Y. Zavalishina, “Restoration of Physiological Activity of Platelets in New-Born Calves With Iron Deficiency”, Biomed Pharmacol J. Vol: 10 num 2 (2017): 711-716.

[5] I. N. Medvedev, “Dynamics of violations of intravascular platelet activity in rats during the formation of metabolic syndrome using fructose models”, Problems of nutrition Vol: 85 num 1 (2016): 42-46.

[6] I. N. Medvedev, “Microrheology of erythrocytes in arterial hypertension and dyslipidemia with a complex hypolipidemic treatment”, Russian Journal of Cardiology num 4 Vol: 144 (2017): 13-17.

[7] A. Arseenko, “Globalization as it is on the threshold of XXI st century”, Sociology: theory, methods, marketing num 4 (2010): 114–137.

the home are the following network facilities: McDonald's, Subway, BurgerKing, Wendy's, KFC, Dunkin Donuts, PizzaHut[8].

Currently, experienced marketers and psychologists are creating food products with the so-called “multi-sensory” attractiveness. The maximum effect of such products on consumers is provided by a system of incentives that successfully enhance positive reinforcement in humans[9]. And the more effective the impact system, the more the uncontrollable (unconscious) possibility of the consumer returning to one or another catering establishment or a sales area is increasing. From the point of view of the theory of reflexive consciousness control, the situation itself causes the subject to make imposed decisions and implement predetermined actions[10]. Such a “habitual behavior” programmed from the outside is connected with stimuli and rewards (reinforcements) obtained as a result of their influence, to which the brain and the human body as a whole react with certain physiological reactions: release of dopamine, reinforcement of a neurophysiological behavior pattern. In essence, this provides for the deployment of schemes for reflexive human activity with the design of mechanisms for conducting and transferring the grounds for making a decision to another. Carefully selected elements of the marketing proposal of fast food cuisine are, in fact, the ideal designer of the natural development of activities[11].

A key objective of this work is to study the systematic creating of a harmonious body image with regard to psycho-socio-biological factors that determine individuals' food-related behaviors.

Materials and Methods

The material of the research study covers 37 reviewed sources. Methods of analysis and synthesis, methods of induction and deduction, as well as the method of generalization were used in the given research.

Research results

The human brain plays a central role in the formation of eating behavior. On the one hand, much is known about the brain and its mechanisms, and too little is known, on the other hand. The reason for this paradox lies in the fact that it is the human brain that, by analyzing itself, allows us to learn only what it considers possible for itself about itself. It is a well-known fact that the brain is made up of about 75 percent water and 15 percent fat, as well as a relatively small amount of salts, proteins and minerals, but being the central regulator controls all body functions, consuming up to 25 percent of all nutrients at its activity peak of all substances consumed by food. The productive, reproductive, protective and other functions that exist in the body allow the brain to survive in a constantly changing external environment while unconditionally coordinating these functions in the body and maintaining a stable constancy of the internal environment. That is, the organism (biosystem) and the brain (neuroendocrine system) work as a single complex multi-level cyber system, combined by direct and feedback connections. For this reason, when acting on any of the parts of such a system, it is possible with a high degree

[8] E. V. Chelnokova, Healthy brain and thin waist (Moscow: De Libri, 2018).
[9] V. Panchenko, Fast food is great and terrible (Dnepropetrovsk: Art Press, 2009).
[10] D. Goleman, About attention, absent-mindedness and life success (Moscow: Publishing House AST”, 2015).
[11] N. N. Danilova, Psychophysiology (Moscow: Aspent Press, 1998), 368.

of probability to influence another part of it, and moreover with a previously predictable result. Since the stimuli acting on a person literally cause the brain to constantly react to them, it is obvious that they can completely or partially change its work, including in terms of food consumption[12].

In the 1960s Paul MacLean created the 'Triune Brain' model, which is based on the division of the human brain into three distinct regions. MacLean's model suggests the human brain is organized into a hierarchy, which itself is based on an evolutionary view of brain development. The three regions are as follows:

1. Reptilian or Primal Brain (Basal Ganglia);

2. Paleomammalian or Emotional Brain (Limbic System);

3. Neomammalian or Rational Brain (Neocortex).

The neocortex is the central regulator, the thinking brain, the connecting element between man and the surrounding reality. When we are making decisions, solving problems or reasoning, the neocortex is engaged, without the involvement of the other brain structures. At the same time, it forms new neural connections and networks, forcing the body to change its behavior. The new emotions and body sensations arising at the same time are again processed by the neocortex, with the formation of even more new neural connections[13].

The limbic system is the brain center of emotions that we inherited from the ancestors of mammals. It is not only the center of emotions, but also of memory, which includes the hippocampus, the striatum and the amygdala. The cells of this part of the brain contain certain “programs” necessary for life in society[14].

Primitive brain, sometimes called the Reptilian brain, is the oldest part of the brain that controls our unconscious behavior and the functioning of the organism as a whole. This part of the brain is in charge of the most basic functions such as breathing and heartbeat. The Reptilian brain in humans, in fact, like primitive reptiles, is aimed at quick actions that do not need to be thought about when receiving a piece of sensory information - “*hit, stop, run, grab, eat*”. But the difference is that this part of the human brain is under the control of more highly located parts of the brain. People are intelligent and capable of conscious learning throughout life that always comes in view of what has changed in the environment. And for this, human needs are controlled by the neocortex. It is in the neocortex that all “programs” that form more complex forms of behavior, including habits and automatic actions, are more complex than those of mammals and reptiles. By connecting a tactile or muscular memory, a person can recall long-forgotten information or very long acquired skills. And this is the merit of not only the neocortex, but also the

[12] M. Kostandi, The brain of man. 50 ideas you need to know about (Moscow: Phantom Press, 2015).

[13] T. Mettsinger, The science of the brain and the myth of its I. Ego tunnel (Moscow: Publishing house AST, 2017).

[14] L. A. Moiseeva, Fundamentals of Neurophysiology (Moscow, Moscow Institute of Psychoanalysis, 2017) y S. V. Shmeleva; F. A. Yunusov; Yu. S. Morozov; A. I. Seselkin y S. Yu. Zavalishina, “Modern Approaches to Prevention and Correction of the Attorney Syndrome at Sportsmen”, Prensa Med Argent num 104 (2018).

cerebellum, that part of the reptilian brain, which is responsible not only for coordination and balance[15].

There are many neurotransmitters in the brain. Neurotransmitters are a diverse group of chemicals, over a hundred in number, but three are still of particular interest.

norepinephrine, dopamine and *serotonin.* Norepinephrine stimulates attention, i.e. the nerve signals that are responsible for motivation and perception, and also ensures the person's emotional state. Dopamine and serotonin - these two mediators are involved in the regulation of the psycho-emotional sphere, both positive and negative emotions are associated with them. The number of neurons using these chemicals as mediators is quite small - only 1-2% of their total number. But since this pair of percent actually represents billions of nerve cells, it is clear that the significance of these mediators in the body is very great. The effect of dopamine on the hypothalamus is rather ambiguous: it acts as a brake on some needs (feeling of hunger, fear centers, parental motivation), and on other needs centers (center of sexual behavior, and in some cases centers associated with aggression) as an activator. It is dopamine that is of particular importance for the correction of eating behavior, since its direct connection with food motivation has been revealed. With this participation, a person constantly assesses and makes a choice in favor of a particular food, and the brain continuously reminds the body: "give me more, and more, and more…". Its release is enhanced at the moment when a person begins to enjoy[16].

Dopamine is a hormone associated with happiness. It is a mediator responsible for our positive emotions, the brain is aware that everything in the body is good, thereby fixing the human food sensations to a state of habit. For instance, the use of sweet. It causes positive emotions in the hypothalamus in the form of signals "rising" into the neocortex due to the release of dopamine. Against this background, these behavioral programs are imprinted in the neurons that provide feeding behavior. As a result, under the influence of this mediator, a deliberate program for food giving pleasure is created[17].

Different types of pleasure "converge" on "dopamine" neurons, so if a person has a dopamine system dysfunction from birth, then it is easier for him to gain excess weight and he (or she) may be predisposed to different types of food addictions. It often happens that people having such features the relationship between positive and negative emotions can be unbalanced. At the same time, a person tries to restore this balance unconsciously, sometimes only aggravating the situation with his behavior[18]. Another important neurotransmitter, like dopamine, serotonin is a type of brain chemical, the so-called "Happiness Hormones". It improves our mood, protects the body from stress, and is a natural antidepressant, acting as a neurotransmitter and a hormone at the same time. With the help of this substance, impulsive behavior is controlled and restrained. As a rule, the causes of incontinence and inability to deny yourself the immediate desires of a person who aggressively "responds" to certain stimuli, lies in the lack of serotonin[19].

[15] V. F. Burlachuk, "The dinning as a subject of sociological research", Sociology: theory, methods, marketing num 4 (2010): 179–186.
[16] S. Pinker, How the brain works (Moscow: Kuchkovo Pole, 2017).
[17] E. V. Morozova; S. V. Shmeleva; O. G. Rysakova; E. D. Bakulina y S. Yu. Zavalishina, "Psychological Rehabilitation of Disabled People Due to Diseases of the Musculoskeletal System and Connective Tissue", Prensa Med. Argent num 104 (2018): 2.
[18] P. V. Simonov, Emotional brain (Moscow, Science, 1981).
[19] V. V. Shulgovsky, Fundamentals of neurophysiology (Moscow: Aspect Press, 2000), 277

The biosynthesis of this neurotransmitter occurs in serotonergic neurons from the amino acid tryptophan, which is ingested with food. That is why some products with a high content of tryptophan, such as red or black caviar, sea kale, hard cheeses, nuts, dried fruits, significantly increase the level of serotonin, causing a feeling of joy and satisfaction. However, the exclusion from the diet of these products due to their high caloric content, can often cause a lack of the "happiness hormone" in the body[20].

The balance of hunger and satiety also implies the participation of hormonal factors in their regulation, namely the influence of hormones on these feelings.

Thus, in this case the main of them is leptin, usually called the "appetite tamer". This hormone is secreted by adipose tissue, so there is a direct link between the amount of fat "reserves" and the amount of leptin in the blood. It is genetically determined that the action of leptin inhibits the centers of hunger, Therefore, this hormone serves as a limiting factor in eating behavior. The hypothalamus, having received a "leptin" signal, synthesizes the hormone melanocortin, perceived by neuron receptors in many parts of the brain as a message of satiety. A certain problem lies in the fact that leptin, being a "signal" protein, hardly passes into the brain, through the barrier, the blood-brain barrier. This barrier does not allow into the brain substances that enter the body along with food that disrupts the activity of nerve cells. For example, glucose passes through the blood-brain barrier to brain neurons almost instantly, and proteins, including leptin, pass with difficulty or do not pass at all. It is also necessary to take into account that with age, the blood-brain barrier also skips leptin. That is why after 45 years, the possibility of gaining excess weight is greatly increased. If a person is not sensitive to leptin, then the feeling of hunger arises from him right from birth[21].

This fact is based on the hypotheses about the possibility of using leptin as a drug to control excess weight, but the implementation of this idea is not yet possible for many reasons. First of all, due to the protein nature of this hormone, which, if it enters the stomach in the form of a tablet or capsule, is completely digested before it enters the blood. However, research on leptin as a medicine continues, and a solution to the problem may be found in the foreseeable future. Studies show that food with a large amount of fat slows down the effect of leptin, and vice versa - low-fat, as well as fiber-rich foods increase the amount of leptin in the blood. That is why it is not recommended to significantly reduce the total daily caloric intake of food since this can dramatically reduce the level of leptin in the blood, and thus disrupt the metabolism[22].

Long-term adherence to various diets provokes a violation in the release of this hormone, and, as a rule, this is the reason for the rapid return to overweight after weight loss. In any case, the rate of calories consumed should not be lower than physiological for the desired body weight. This will help to maintain leptin in the blood and control your appetite in the future[23].

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[20] V. V. Shulgovsky, Physiology of the central nervous system (Moscow: Publishing of MSU, 1997), 390.

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In order to maintain the leptin level in normal balance, it is necessary to fulfill only four conditions: not to reduce calorie intake below the optimum; reduce the fat content in food, but not below the recommended rate; regularly do physical exercises, which also increase the susceptibility to leptin and “accelerate” the metabolism; and finally, have full and healthy sleep[24].

The hormone ghrelin is the second of the most important hormones mainly produced in the stomach. It travels through your bloodstream and to your brain, where it tells your brain to become hungry and seek out food. It turned out that an empty stomach not only transmits electrical signals to the centers of hunger, but also secrets ghrelin, which increases the feeling of hunger and appetite, as well as reduces the level of metabolism. That is, the higher the concentration of ghrelin in the blood, the greater the desire to eat, even when permanently full. The study of "ghrelin" drugs is even more active than in relation to liptin, since the reduction of ghrelin in the body with the help of drugs, opens up great prospects in the fight to reduce feelings of hunger. It has been firmly found that in order to reduce ghrelin in the blood, it is necessary to introduce into the diet a larger amount of protein products with the exception of products rich in fructose. Equally important for the correction of eating behavior is, as in the case of leptin, full and healthy sleep, since an increase in ghrelin level is often associated with sleep disorders[25].

Discussion

The external environment’s effect on the entity is always very ambiguous. Food is a serious physiologically significant factor. It provides all organs with plastic and energetic material and supports viability[26]. At the same time, its adequacy and at the same time the quality and balance of consumed products is of great importance in the physiology of nutrition. According to experts of the World Health Organization in the past 20 years overeating has become a characteristic feature for people. The average body weight of an earthling significantly increased from 73,7 kg for males and from 62,2 kg for females in 1980 to 81,6 kg and 68,8 kg, respectively, in our time[27].

It is now firmly established that the human brain plays a major role in the formation of eating behavior. On the one hand, much is known about the brain and its mechanisms, and too little is known, on the other hand. The reason for this paradox lies in the fact that it is the human brain that, by analyzing itself, allows us to learn only what it considers possible for itself about itself. It is a well-known fact that the brain is made up of about 75 percent water and 15 percent fat, as well as a relatively small amount of salts, proteins and minerals, but being the central regulator controls all body functions, consuming up to 25 percent of all nutrients at its activity peak of all substances consumed by food. The productive, reproductive, protective and other functions that exist in the body allow the brain to survive in a constantly changing external environment while unconditionally

[24] S. Yu. Zavalishina y I. N. Medvedev, “Comparison of opportunities from two therapeutical complexes for correction of vascular hemostasis in hypertensives with metabolic syndrome”, Cardiovascular therapy and prevention Vol: 16 num 2 (2017): 15-21.

[25] I. A. Skoryatina; S. Yu. Zavalishina; O. N. Makurina; G. S. Mal y O. V. Gamolina, “Some aspects of Treatment of Patients having Dislipidemia on the Background of Hypertension”, Prensa Med Argent Vol: 103 num 3 (2017): 9.

[26] I. N. Medvedev, “Microrheology of erythrocytes in arterial hypertension and dyslipidemia with a complex hypolipidemic treatment”, Russian Journal of Cardiology num 4 Vol: 144 (2017): 13-17.

[27] A. Arseenko, “Globalization as it is on the threshold of XXI st century”, Sociology: theory, methods, marketing num 4 (2010): 114–137.

coordinating these functions in the body and maintaining a stable constancy of the internal environment. That is, the organism (biosystem) and the brain (neuroendocrine system) work as a single complex multi-level cyber system, combined by direct and feedback connections. For this reason, when acting on any of the parts of such a system, it is possible with a high degree of probability to influence another part of it, and moreover with a previously predictable result. Since the stimuli acting on a person literally cause the brain to constantly react to them, it is obvious that they can completely or partially change its work, including in terms of food consumption[28].

The Nobel Prize in Physiology or Medicine 2004 was awarded jointly to Richard Axel and Linda B. Buck "for their discoveries of odorant receptors and the organization of the olfactory system." The discovery made it possible to study the sense of smell and to explore how the brain discriminates among odors. It is proved that a person is able to distinguish more than 10,000 different odors. As soon as he smells cinnamon and muffin, signals rush into his brain, which become a definite map of the corresponding smell. And the more a person sniffs something, the more encodings remain inside him. Odors are adjoined with the definitions of taste, texture, and product temperature. When a person tastes a freshly baked bun, he immediately determines that it is a bun with raisins, fluffy consistency, sweet and warm taste, fresh from the oven. All this is constantly mapped in his brain[29].

For some foods sound is incredibly important because everyone loves crunchy foods, and neuromarketologists also think about this, using people's addictions. And, of course, sight gives a lot of information in the process of eating - a person is very impressed with beautiful, bright, neat dishes[30]. Therefore, in restaurants so much attention is paid to a beautiful, bright design with extraordinary sauces. Even the term "neurogurman" appeared - it was introduced by Gordon M. Shepherd, since many taste options are analyzed in the neocortex for decision-making. He explained an incredible number of flavors that are unique. With the help of new methods of non-visualization, Shepherd proved the presence in the human brain of the presence of so-called "taste cards", which are located in different areas. All this helps a person to learn the food that he has already tasted or could highlight a new taste and write it into a new card. This can explain the presence of favorite foods and dangerous foods (where a person has an allergic reaction or was a process of poisoning)[31].

In humans, the different types of taste cells are scattered throughout the tongue. It also includes a reaction to water, as well as a reaction to fat. The tongue signal is transmitted first to the brain of reptiles, where the centers of innate taste perceptions are located and with the launch of reactions to chewing and swallowing. Then, through the

[28] I. N. Medvedev y N. I. Gromnatskii, “The influence of hypocaloric diet on thrombocyte rheology in patients with metabolic syndrome”, Klinicheskaia meditsina Vol: 84 num 3 (2006): 49-52 y M. Kostandi, The brain of man. 50 ideas you need to know about (Moscow: Phantom Press, 2015).

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[31] V. V. Nikolenko, “Gastronomic culture of society: theoretical and methodological foundations of analysis”, Bulletin of VN Karazin Kharkiv National University. Series "Sociological studies of modern society: methodology, theory, methods" num 993 (2012): 44-48 y T. I. Glagoleva y S. Yu. Zavalishina, “Physiological Peculiarities of Vessels’ Disaggregating Control over New-Born Calves’ Erythrocytes”, Annual Research & Review in Biology Vol: 19 num 1 (2017): 1-9.

limbic system, information is sent to the neocortex, it perceives a holistic taste - this is also smell and skin sensitivity. Three information flows work cohesively. But the key role in nutritional needs is played by the hypothalamus, it is there that the signal comes in whether a person eats good or bad food and it is there that positive emotional signals arise that make the neocortex remember what to do to eat well. And, on the contrary, in the same place, negative emotions arise, that a person has eaten something not high-quality and the neocortex remembers that such actions are undesirable. The memory of the poisoning is very strong. One can get poisoned with something in early childhood and not remember it, but the hypothalamus and the neocortex are very well remembered and for some reason a person still does not like any product[32].

Food is the most reliable source of positive emotions. And these emotions are so reliable that a person prefers them to everyone else. In the hypothalamus there are neurons that generate positive emotions for a variety of reasons and the same neurons can be excited when a person has eaten well and when he has escaped danger or learned something new and there also exist neurons that generate negative emotions. The researchers also discovered that each population of neurons can inhibit the other: When they stimulated activity in the reward neurons, activity in the fear neurons was suppressed, and vice versa. This suggests that the brain constantly balances activity between these two populations of neurons. And food makes a very serious contribution to this balance and if a person eats poorly or goes on a diet, then the balance of brain processes is often disturbed. Therefore, one needs to be very careful about such experiments. That is why a person begins to eat more often in a bad mood, weakening of positive emotions, trying to "seize" problems[33].

Taste has a complex system. There are salty, bitter, sour and sweet receptors - these are the four basic tastes that were distinguished in ancient times. Umami, the fifth taste, was discovered recently. The term umami comes from Japan. Early 20th century Japanese physiologists Prof K. Ikeda isolated glutamate from Kombu seaweed and called it umami which translates to delicious. It has been found that there are a lot of taste receptors for glutamate in the tongue. Nowadays, artificial glutamate has been used as a flavoring additive, which is used in the food industry to create the impression of meat broth, and if you sprinkled glutamate on boiled vegetables, it will seem that they were boiled together with meat. It has a thick bouillon flavor, which is typical for meat and for many cheeses and mushrooms. Since there is a lot of glutamate in food, in connection with this, our taste system, evolving, has tuned in to glutamate as a signal to eat protein. A person eats to receive energy and building material from which he builds cells. Therefore, a person likes this, and he experiences positive emotions, which triggers eating behavior. If glutamate is found in food, this means that a person has received protein, a good, correct building material, therefore he has taste buds for glutamate, which are found in the tongue[34].

[32] S. Samokhina, "Philosophy of the newest nutrition", Time num 5 (2015): 6 -12.
[33] A. M. Ugolev, Theory of adequate nutrition and trophology (St. Petersburg: Science, 1991) y T. I. Glagoleva y S. Yu. Zavalishina, "Physiological Peculiarities of Vessels' Disaggregating Control over New-Born Calves' Erythrocytes", Annual Research & Review in Biology Vol: 19 num 1 (2017): 1-9.
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Conclusion

The importance of nutrition for the human organism cannot be overestimated. It provides all organs with plastic and energetic material and supports viability. Unfortunately, in the developed world nutrition is not always balanced and safe. It is known that in recent years, the average body weight of a person has increased significantly. It provides a framework for establishing the importance of the detailed study of nutrition behavior and the role that the brain plays in it. It has been found that the role of the brain in nutrition behavior is very multifaceted; at the same time the bark and the subcortex both obviously play an important role in this process. Also it has been firmly established that neurotransmitters like norepinephrine, dopamine, and serotonin play an important role in the regulation of nutrition behavior as well as the balance of appetite-regulating hormones: leptin and ghrelin. It is proved that food is the most reliable source of positive emotions. Sometimes people prefer them to everyone else. A delicate balance between the centers of positive and negative emotions can be formed in the brain due to food. Negative emotions can get us into depression, but surprisingly, too much positive emotions might not always be adaptive or good for psychological health. Much is already known on the basics of human nutrition behavior. However, this analysis identifies that there are general uncertainties common to nutrition behavior physiology which lead to further research.

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