

ORIGINAL ARTICLE

Assessment of The Actual Nutrition of School Children in The Samarkand Region

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ABSTRACT

Unhealthy diets are one of the leading causes of morbidity and mortality in the general population, which have a significant impact on the indicators of obesity and overweight. In 46 of the 53 countries in the European Region, more than 50% of the population and one in three children are overweight, obese, and other noncommunicable diseases, children and adolescents are particularly exposed to unethical food marketing through all communication channels, from television to online video games and social media [1,2,33]. The aim of this work is to study the actual nutrition of primary and secondary school students in Samarkand (schools 63, 62 and Nurabad district of the Samarkand region (schools 1, 2, 3). The frequency method was used to study the actual power supply. Currently, it is one of the most popular methods used in epidemiological studies to assess the relationship between the nature of nutrition and the development of certain non-communicable diseases, such as diseases of the cardiovascular system, diseases of excessive and insufficient nutrition, etc. The method focuses on the analysis of actual food consumption and makes it possible to assess minor changes in the nature and diet. At the same time, the data obtained allow students to be divided into categories according to the level of food consumption (low, medium, high), which makes it possible to establish a relationship between food consumption and morbidity.

Keywords: actual nutrition, fast-food, health indicators of school-age children.

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INTRODUCTION

We studied the products consumed in 4 comprehensive schools in Samarkand (schools 63, 62 and Nurabad district schools 1, 2, 3 with the same age and gender composition of students, as well as with similar, standard curricula. The products consumed were divided into the following columns: milk, cottage cheese, cheese, meat, poultry, sausage, fish, vegetables, potatoes, fruits, eggs, cereals, pasta, white bread, black bread, confectionery, vegetable oil, butter, mayonnaise, nuts, juices, chips, Coca-Cola and other sweet drinks, bottled water, coffee, vitamins, microelements and other biologically active food supplements. The study of actual nutrition showed a steady increase in the consumption of fast foods by schoolchildren: chips, Coca-Cola, coffee, mayonnaise and other products not recommended for children and adolescents. Fast foods usually contain genetically modified components and many food additives: preservatives, flavor enhancer glutamate, colorings. Many additives themselves often cause so-called pseudo-allergy." L. Luss draws attention to the fact that if true allergic asthma already exists, then the use of "fast food" leads to a more severe course of it. In addition, "fast food" negatively affects the gastrointestinal tract, liver, endocrine and immune systems. Its composition includes a huge number of substances harmful to health, such as a mixture of preservatives, colorings, flavorings, stabilizers and transgenic soy [33,35,48,49,53].

The aim of this work is to study the actual nutrition of primary and secondary school students in Samarkand (schools 63, 62 and Nurabad district of the Samarkand region (schools 1, 2, 3).

MATERIAL AND METHODS

The frequency method was used to study the actual power supply. Currently, it is one of the most popular methods used in epidemiological studies to assess the relationship between the nature of nutrition and

the development of certain non-communicable diseases, such as diseases of the cardiovascular system, diseases of excessive and insufficient nutrition, etc. The method focuses on the analysis of actual food consumption and makes it possible to assess minor changes in the nature and diet.

RESULTS AND DISCUSSION

Cheap fat substitutes (margarines, and they contain trans fats, which are dangerous for the heart and, according to some data, cause cancer) are used in order to save money. It should be noted that nutritionists have established that the daily consumption of trans fats is normally recommended at -1%. However, a serving of French fries contains - 30-40%. Table 1 shows the impact of fast foods on the human body (Table 1).

Table 1: The impact of fast foods on the human body

Name	Ingredients	Effect on the body
Chips	Acrylamide, dry puree, technical fat, corn starch, flavors, dyes, preservatives	Negative effect on the central nervous system, cancer
Soda	Water, sugar, aspartame, carbon dioxide, malic acid, citric acid, less often orthophosphoric acid - E338	Obesity, enamel destruction, decreased feeling of hunger for some time, stimulation of gastric secretion, development of diabetes, increased acidity of gastric juice, flatulence
Noodles	Noodles Starch, salt, emulsifiers, thickeners, sodium glutamate, flavors	Peptic ulcer, gastritis
Hamburger	Low-grade meat, lettuce, tomatoes, canned food, pickles, carcinogens	Diabetes mellitus, infertility, ischemia, deterioration of the immune system, obesity, metabolic disorders, deterioration of the gastrointestinal tract, cardiovascular diseases
Hot dog	Harmful fats, sugar, dyes, food leavening agents, flavors	Destruction of nerve tissue, triggering inflammatory processes, damage to the brain structure
Corn flakes	Synthetic vitamins (A, B, D) and minerals, harmful trans fats, flavor enhancers	Allergic reactions, cancer, dental caries in children

It should be noted that fast food portions are extremely poor in proteins, but they are necessary for the normal functioning of the body. For example, a sandwich contains 9 g of protein, while the required amount is 100 g. Fast food includes: chips, nuggets, pizza, hot dogs, popcorn, hamburgers, sandwiches, etc. Because all this is fried in a large amount of oil, which is not changed sometimes for several days, fast food becomes not just harmful, but dangerous food for children. The mildest consequence of eating such "delicacies" can be food poisoning or an upset stomach, but in the future, this "diet" threatens obesity, dementia, metabolic disorders, kidney and vascular diseases. According to the results of many studies, it has been proven that fast food is harmful. Thus, with systematic consumption of this product, significant disorders in the functioning of human organs and organ systems were revealed, such as diseases of the cardiovascular system, gastrointestinal tract, obesity, etc. The basis for the occurrence of these diseases is the composition of fast food, as well as its caloric content. For example, a serving of French fries contains 3000 calories and 217 g of fat, with a daily norm for a person of 2000-2500 kcal and 65 g of fat. In addition to fat, fast food contains a large number of sugars, salt, preservatives [1,3,912,24,58,60]. It should be noted that in addition to such food, various carbonated drinks, Coca-Cola, etc. are most often purchased, which in combination with fast food complicate the digestion process. Carbonated drinks contain a lot of easily digestible calories, which act on the human brain as a decoy. On the one hand, it seems that he has satisfied his hunger, and after a short period of time he feels this feeling again. But it is worth understanding that these calories have not disappeared anywhere, they accumulate in the body, increasing the risk of obesity and diabetes. Fast food together with carbonated drinks can cause cancer, gastrointestinal diseases and infertility. All these diseases occur due to the presence of acrylamide, which is part of chips, bread, crackers, etc. In 1994, the International Agency for Research on Cancer (IARC) classified acrylamide as a "possible carcinogen" [23,24,31,34]. The ability of acrylamide to cause malignant neoplasms and mutations, changing the genotype, was proven in experiments with animals. In 2002, a research institute in Sweden conducted studies at catering establishments where fast food is prepared. More than 100 enterprises came under control. Our studies have shown that when high-carbohydrate foods are cooked, large amounts of acrylamide are released. Thus, the amount of this substance in potato chips is 500 times higher than the maximum permissible level, according to special rules of the World Health Organization. In another type of potato - fried slices, a 100-fold excess of the

maximum norm was found. According to scientists, the results of experiments have proven that this carcinogen contributes to the formation of malignant tumors of the stomach. Diabetes mellitus is one of the main problems of modern society. It occurs, among other things, due to improper food, which contains a large amount of carbohydrates and fats. The content of these substances in fast food products is very high. After eating this food, the body breaks down carbohydrates into sugar (glucose), which then enters the blood. Then the pancreas releases insulin, which helps transport sugar to the cells. After the consumption of glucose by the cells, another hormone of the pancreas is secreted - glucagon. With systematic consumption of fast food, frequent surges in sugar in the human blood are possible. All this has a detrimental effect on the normal functioning of the pancreas, which can lead to type II diabetes or to a decrease in the sensitivity of the body's cells to the action of insulin. Excess sugar affects the appearance of excess weight, which in turn affects the cardiovascular system. In addition to a large amount of carbohydrates, fast food contains a lot of trans fats, which increase the cholesterol level in the blood. High cholesterol in the blood increases the risk of stroke and cardiovascular diseases. Fast food products contain a large amount of sodium, the excess of which can retain water in the body. Excess water causes swelling, bloating, and sodium affects the occurrence of urolithiasis and the development of cancer of the kidneys and stomach. In addition, sodium negatively affects the condition of the bones, making them more fragile, as a result of which, osteoporosis may develop. Fast food products contain a flavor enhancer - sodium glutamate. With frequent use, it causes disturbances in the functioning of the nervous system, allergic reactions may occur, including asthma and eczema (5).

When studying the actual nutrition of children, it was also noted in the diet of products enriched with mayonnaise and ketchup. Mayonnaise and ketchup are also not the healthiest food for a child's body. Even the highest quality or homemade mayonnaise is still heavy food for the intestines. Therefore, you can eat it very little, and it is better as part of other dishes. The main disadvantage of mayonnaise is the high calorie content of the product: 600 - 700 kcal per 100 g of product. Children with diseases of the stomach, intestines, liver, especially in the acute stage, it is better to exclude mayonnaise from the diet. Store-bought mayonnaise, then various mixtures are used (egg powder, dry milk), additives (emulsifiers, dyes, preservatives) - which give the desired consistency, etc. Flavor enhancers are also added, after which many want to use this product again and again. The harm attributed to mayonnaise is mainly associated with its high fat content. The health hazard is mainly caused by adding mayonnaise to fried foods or combining it with fatty meat products. Also, mayonnaise contains many preservatives, antioxidants and other additives that can negatively affect the health of children. Mayonnaise, which is produced using low-quality ingredients, can contain bacteria and viruses that can cause various diseases. In addition, mayonnaise can become a source of intoxication if it is stored at the wrong temperature or if the expiration date has expired. Based on the data obtained, we have identified the consumption of these non-recommended products among both primary school children and middle and, especially, senior school children. It should be noted that such nutrition of schoolchildren leads to an increase in risk factors for the development of various diseases (6). When studying the health of schoolchildren, frequent complaints were found about disorders of the gastrointestinal tract: abdominal pain (aching and cramping, occurring before or after meals), belching and flatulence, loss of appetite, headache, constipation, dizziness, nausea and vomiting, restless sleep: cardiovascular system - cyanosis of the lips, general pallor, rapid fatigue, shortness of breath after active games, frequent colds, and also revealed complaints about general weakness, poor memory, attention and academic performance. Table 2 presents the nutritional characteristics and subjective health indicators of children of primary, middle and senior school age.

Table 2: Features of nutrition and subjective health indicators of children of middle school age

They eat:	Primary school age (7-10 years)	Middle school age (11-14 years)	Senior school age (15-17)
	81,3±5,1	79,6±4,9	78,9±4,2
- chips	64,7±4,8	65,8±5,1	63,6±4,9
- coca-cola	28,9±3,0	27,7±2,9	29,7±3,1
- coffee	43,8±3,8	42,4±3,1	46,4±3,5
Complaints:			
from the cardiovascular system;	11,3±1,7	16,2±2,2	12,1±1,8
from the gastrointestinal tract;	22,1±3,0	37,8±3,2	23,6±2,8
general weakness and fatigue;	19,4±2,1	34,7±2,9	20,3±2,1
weakening of memory and attention	16,9±2,3	31,6±3,3	17,6±1,9

At the same time, complaints about disorders of the gastrointestinal tract, cardiovascular system, general weakness, fatigue, poor memory and attention were approximately the same in both control and experimental schools. At the same time, with age, schoolchildren have more frequent violations of the diet. For example, older schoolchildren eat twice a day than younger and middle-aged schoolchildren. Such a diet in older schoolchildren leads to a significant increase in the gap between meals to 7-8 hours, which adversely affects their health. We studied the level of consumption of basic food products in school-age children (Table 3), and it was found that the level of consumption of basic food products in school-age children in the winter-spring period is several% below the norm, in the summer-autumn period they correspond to the norm.

Table 3: Level of consumption of basic food products in school-age children

Nº	Names of food products, physiological norms (g)	Winter-spring period, (g)	Summer-autumn, (g)	in % of the norm	Recommended (g)	
1	Dairy products	300,0	294,4±0,5	55,0/63,0	300	
2	Berries and fruits	200,0	145,8±0,4	60,0/70,0	196,0	
3	Vegetables	350-400,0	356,0±0,7	70,0/75,0	380,0	
4	Bakery products	150-200	194±0,8	143,3/173,3	196,0	
5	Potatoes	250,0	200,0±0,2	50,0/66,6	250,0	
6	Meat products	95-105,0	105,0±0,4	72,9/73,6	100,0	
7	Sugar and KI	35,0	24,6±0,4	79,1/83,4	50,0	
8	Fish products	70,0	68,0±0,2	20,0/25,0	65	
9	Vegetable oil	18,0	16,4±0,5	80,0/70,0	188,0	
10	Animal fats	35,0	31,7±0,4	83,5/72,0	35,0	
11	Egg (pcs.)	1	0,1±0,02	0,1±0,01	20,0/20,0	1

We have studied the nutritional value of food products. Figure 1 shows the nutritional value of products for school-age children.

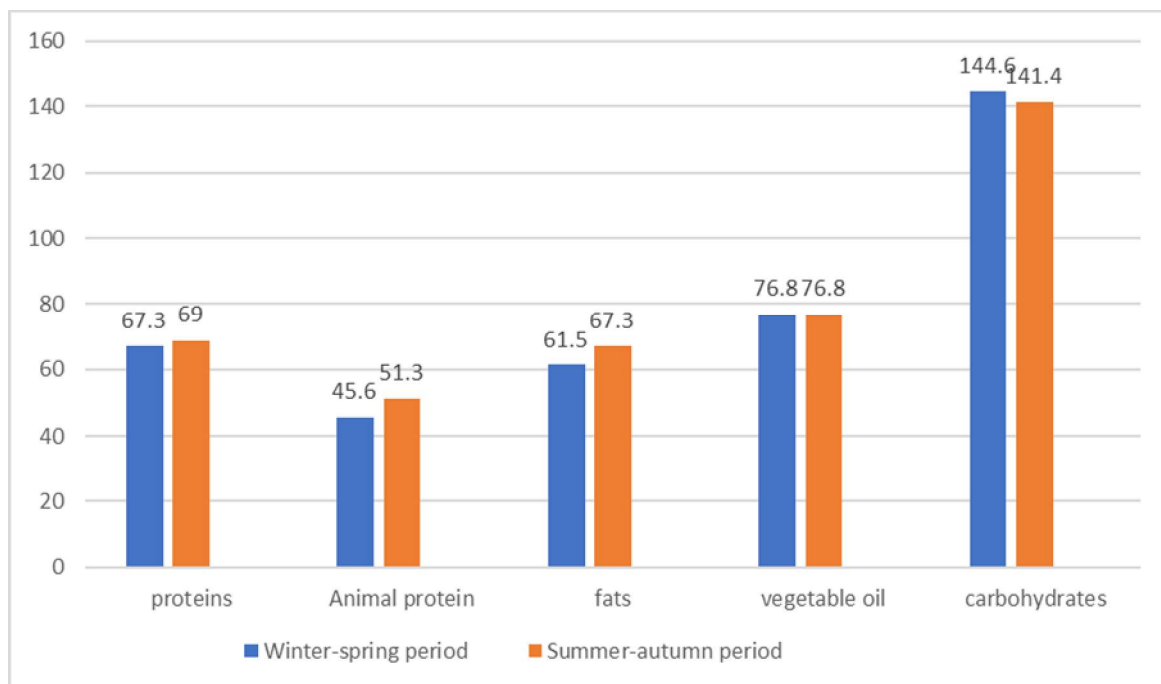


Fig. 1. Nutritional value of food products for school-age children (compared to the norm, in %)

It should be noted that boys and girls showed a decrease in protein intake in the winter-spring (67.3%) and summer-autumn periods (69.0%). At the same time, boys showed an increase in the amount of carbohydrates (144.6% and 141.1%), and adolescent girls showed an excess of fat and carbohydrate intake in the daily diet.

It should be noted that significant principles of healthy eating are aesthetic requirements for food - it should look healthy, fresh, have a beautiful appearance and a fresh smell.

Based on the principles of gentle nutrition, we have developed a model of rational nutrition. The modern model of rational nutrition has the form of a pyramid: the products in it are arranged from the base to the top in decreasing order of their usefulness. The modern model of rational nutrition has the form of a pyramid: the products in it are arranged from the base to the top in decreasing order of their usefulness. Based on it, you can make a balanced diet for every day. The base of the pyramid is formed by whole grain products, the importance of which is often underestimated and the content of which in our menu is usually insufficient. And there should be from 6 to 9 servings of them in the daily diet! 1 serving of grain products is 1 slice of whole grain bread or 1.5 cups of cooked pasta, or 1.5 cups of cooked rice. Cereals (buckwheat, brown rice, oatmeal) contain a lot of vitamins A and E, in addition, vitamins in them do not deteriorate over time as intensively as in vegetables and fruits. The next level of the pyramid is vegetables and fruits (2 separate groups). There should be an average of 5 servings of vegetables in the daily diet. Fruits - from 3 to 5. 1 serving of fruit is 1 medium fruit (orange, apple) or 1 cup of chopped fruit, or 1.5 cups of juice, or 1 cup of dried fruit. (Fig. 2). As a source of vitamin C, it is recommended to drink a decoction of dried rose hips, leafy greens, red pepper, frozen black currants, citrus fruits and sauerkraut. When the immune system is weakened, it causes an exacerbation of various chronic diseases, therefore, maintaining immunity is a priority. It is very important to include bright yellow, orange and red vegetables and fruits (tomatoes, pumpkin, sweet peppers) in the diet. It is very important to include bright yellow, orange and red vegetables and fruits (tomatoes, pumpkin, sweet peppers) in the diet. They contain water-soluble beta-carotene, a precursor of vitamin A, which is converted into fat-soluble vitamin A in the body. It is necessary to drink freshly squeezed juices, and not only fruit, but also vegetable. The diet must include high-protein foods containing essential amino acids: lean meat, poultry, fish.

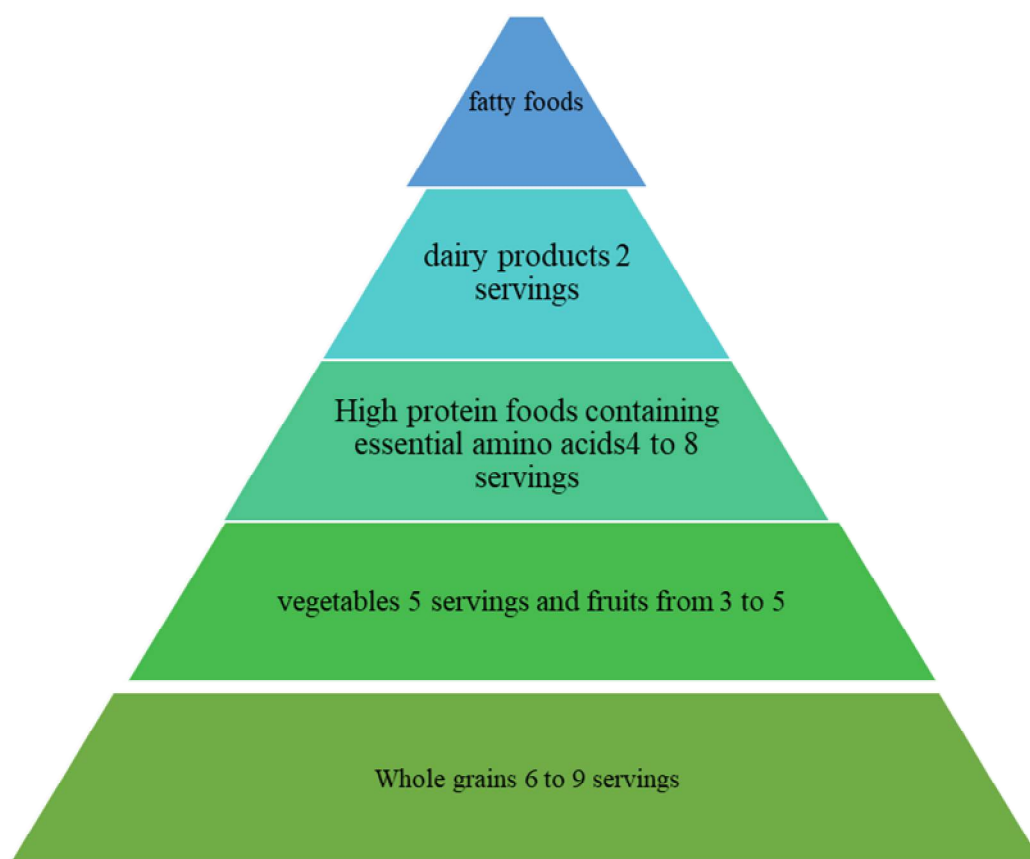


Fig. 2. Modern model of rational nutrition

You should consume 4 to 8 servings of such products (1 serving: 30 g of cooked meat, poultry or fish, 1 cup of beans, peas or lentils, 1 egg or 2 whites, 30-60 g of low-fat cheese, 1 cup of low-fat cottage cheese). Meat contains iron, which is an immunomodulator, and B vitamins (mainly in pork). Vitamins and microelements from different types of products are absorbed with varying intensity. Dairy products, a source of vitamins A and E, should also be on the table every day. Fermented milk products containing live bifido- and lactobacilli, which are necessary for the prevention of intestinal dysbacteriosis, will help maintain immunity. There should be 2 servings of dairy products in the daily diet (1 serving - 1 cup of skim milk or low-fat yogurt, kefir). The group of fat-containing products includes nuts, animal and

vegetable oils. The latter are a source of heart-healthy polyunsaturated fatty acids. Butter is included in this group, but its consumption should be limited.

Thus, the diet of younger schoolchildren is close to the diet of older schoolchildren and adults. The child's body, which is in a state of continuous growth, needs food containing large amounts of vitamins and minerals. In the cold season, there should be slightly fatter than in the summer, so the body receives the necessary amount of energy in a small amount of food. The menu should include various salads, fresh fruits and vegetables. A large amount of milk and dairy products is preserved.

To strengthen memory and develop abilities, you can offer him nuts: almonds and walnuts; dried fruits: figs, raisins - also for good memory and fatigue relief. 3-4 apples will help not only to have a good rest, but also to quickly absorb new knowledge and not "lose" it the next day. You should not use chocolate as the main source of nutrition when preparing for exams, because it is a simple carbohydrate, so when it is consumed, the concentration of glucose in the blood increases very quickly, but also quickly falls, which leads to mental fatigue. In this case, preference should be given to complex carbohydrates. Cheese, fresh berries and cottage cheese should be actively included in the diet. The child should receive the most intensive nutrition during exams. For the full functioning of the brain, it is necessary to provide it with a sufficient amount of unsaturated fatty acids, which are abundant in flaxseed, sunflower, olive oil, as well as in wheat germ oil. Fish, fish products, seafood contain a huge amount of essential fatty acids "Omega-3". Thanks to them, the brain will work smoothly, without "breakdowns" and difficulties. The yolks of chicken eggs also contain a lot of useful and necessary things (consumption no more than 3-4 per week). It should be noted that for the normal functioning of the nervous system, which works at its limit during study and exams, a child needs B vitamins and vitamin C.

CONCLUSIONS

1. The products consumed in comprehensive schools were studied, while a steady increase in the consumption of chips, Coca-Cola, coffee, mayonnaise and other products not recommended for children and adolescents was noted.
2. When studying the health of schoolchildren, the following was revealed: disorders of the gastrointestinal tract, cardiovascular system, general weakness, fatigue, poor memory, decreased attention, academic performance, etc.
3. A study of the nutritional value of food products in school-age children showed that boys, as well as girls, showed a decrease in protein consumption, an increase in the amount of carbohydrates, in addition, adolescent girls had an excess of fat consumption in the daily diet.
4. A modern model for primary school children was developed.

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