

## ANALYSIS OF NUTRITION OF PRESCHOOL AGE CHILDREN EDUCATED IN NAMANGAN PROVINCE

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**Abstract.** *In the analysis and evaluation of the diet of 762 children of preschool age (415 boys and 347 girls), brought up in preschool educational institutions, aged 3-7 years. The studies were analyzed on the basis of SanPiN 0038-2017 in the winter-spring and summer-autumn periods. At children of preschool educational institutions the daily diet does not correspond to hygienic requirements, fish products are not included in their diet, and also as the low level in a diet of milk and dairy products, fruits and vegetables, the maintenance of proteins on 8,9-9,6%, fats to 8,2-9,2% is less from physiological norm, the quantity of carbohydrates more than 10,5% -11,0% from the required quantity. During the year, in the diet of mineral substances is less in calcium and iron, vitamins of group B. The discrepancy of the daily diet of preschool children to hygienic requirements can be the cause of the development of alimentary diseases.*

**Keywords.** *preschoolers, actual nutrition, nutrients of the daily diet, proteins, fats and carbohydrates.*

## ТЕКСТ НАУЧНОЙ РАБОТЫ НА ТЕМУ «АНАЛИЗ ПИТАНИЯ ДЕТЕЙ ДОШКОЛЬНОГО ВОЗРАСТА, ОБУЧАЮЩИХСЯ В НАМАНГАНСКОЙ ОБЛАСТИ»

**Аннотация.** *Проведен анализ и оценка рациона питания 762 детей дошкольного возраста (415 мальчиков и 347 девочек), воспитывающихся в дошкольных образовательных учреждениях, в возрасте 3-7 лет. Исследования проводились на основании СанПиН 0038-2017 в зимне-весенний и летне-осенний периоды. У детей дошкольных образовательных учреждений суточный рацион не соответствует гигиеническим требованиям, в их рацион не включены рыбные продукты, а также низкий уровень в рационе молока и молочных продуктов, фруктов и овощей, содержание белков на 8,9-9,6%, жиров на 8,2-9,2% меньше от физиологической нормы, количество углеводов более 10,5%-11,0% от необходимого количества. В течение года в рационе минеральных веществ меньше кальция и железа, витаминов группы В. Несоответствие суточного рациона дошкольников гигиеническим требованиям может быть причиной развития алиментарных заболеваний.*

**Ключевые слова.** *дошкольники, фактическое питание, нутриенты суточного рациона, белки, жиры и углеводы.*

## INTRODUCTION

The diet of children of preschool age is closely related to the morphological and functional characteristics of the organism of children of this age. The children's body differs from the body

of adults in terms of growth and development, formation of the composition of all organs and systems, development and improvement of their activities [3,4, 9, 20, 21].

During the day, the main nutrients of children's diet should be provided with protein, fat, carbohydrates, micronutrients and vitamins (S, V, folic acid, carotene) and minerals (calcium, phosphorus, iron, magnesium, iodine, etc.) is estimated to be derailed and cause an increase in the number of various diseases [8, 11, 15, 17, 19]. Analysis of actual nutrition of children of preschool age in Russia by B.S. Koganov showed the presence of polyhypovitaminosis in children [9].

Deficiency of group V vitamins was found in 50-90%, ascorbic acid in 20-35%, vitamin A deficiency in 20%, carotene deficiency in 50-90% of examined children. Lack of vitamin supply in 80% of cases is accompanied by calcium and phosphorus microelements, 50%-iron, 50%-magnesium deficiency, iodine and zinc deficiency and is determined regardless of the seasons and the child's age [6, 8, 9, 11, 15, 17, 19].

Today, a number of activities are being carried out in our country to prevent and eliminate diseases related to healthy eating. In the Action Strategy for five priority areas of development of the Republic of Uzbekistan in 2017-2021, "...implementation of complex measures aimed at improving and strengthening the health of the population, reducing morbidity rates, preventing nutrition-related diseases and increasing life expectancy..." [1, 2]. In performing these tasks, prevention and diagnosis of various diseases, raising the level of modern medical services to a new level and providing quality food products, improving the use of modern technologies and reducing the incidence of nutrition-related diseases among different strata of the population through healthy eating allows to reduce the level and increase the level of longevity.

Significant changes in the structure and quality of food have occurred in connection with a sharp change in socio-economic conditions [10, 15]. In modern conditions, the nutrition of children of preschool age has certain characteristics, because the influence of mass media and information and communication technologies is developing year by year. In this regard, studies on the habits and taste preferences of children of preschool age, eating habits and learning to organize it are of great importance.

**The purpose of the study.** It consists of a hygienic analysis of the eating habits of children of preschool age living in Namangan region.

**Materials and methods of the research.** Investigations were carried out in some preschool educational institutions in urban and rural conditions in the Namangan region of the Fergana Valley. 762 (415 boys and 347 girls) children under the age of 3-7 who are being educated in preschool educational institutions No. 13 and 42 in Namangan city of Namangan region, No. 18-21 in Namangan district were taken under control. The researches were analyzed according to the content and structure of the distribution of at least 9 meals per month in the winter-spring and summer-autumn seasons of the year and every 10 days of the year. Daily food book 0348-2017 "**Hygienic requirements for the organization of full and safe nutrition in preschool educational institutions of the Republic of Uzbekistan**"[12]. was compared and analyzed with the requirements of sanitary standards and regulations. The nutritional and biological value of the daily ration was carried out according to "Chemical composition of food products"[5,16].

"Statistica for Windows 7.0" personal computer software package was used for statistical processing of research results.

Analysis of the obtained results. Table 1 shows the feeding schedule of children being educated in pre-school educational institutions (MTE) in Namangan region under control.

Table 1

**Distribution of food habits of children educated in pre-school educational institutions of Namangan region**

Type of meal	Meal time, in moderation	Meal pattern, in moderation	Meal pattern, in moderation
Breakfast	8.00-8.30	15-25%	20-25%
Second breakfast	10.00-10.30	5-10%	-
Lunch	12.00-13.00	35-40%	40-50%
Dinner	16.00-17.00	15-25%	20-25%

Hygienic analysis of the meals of pre-school educational institutions under control showed that the meals do not meet the established requirements. Despite the absence of second breakfast and/or afternoon tea in pre-school educational institutions, the daily meal schedule is in accordance with hygienic requirements. However, as it can be seen from the results of the survey of the children and their parents, it was found that even in the children's home, eating in the evening led to the derailment of the established eating routine. This, in turn, together with the derailment of children's daily eating routine, indicates that children's ability to work physically and mentally has decreased, and the ground has been created for mental stress, as well as derailment of exchange processes.

It is important to organize meals for children of pre-school age for 9-10 hours, sometimes 24 hours a day. This, in turn, depends on the proper organization of nutrition in MTMs, the health of children and the state of morbidity among them [2, 7, 8, 14, 18]. In the works of several authors, the possibility of a sharp deviation from the current normative indicators in the organization of nutrition in MTMs and the creation of conditions for the spread of various somatic and infectious diseases as a result of it [6, 11, 18]. The daily ration received in the conditions of MTM is the basis of the actual nutrition of the child. Therefore, the diet of children of preschool age on weekends should not differ from the diet of preschool children.

The content of the main food products in the daily diet of children of preschool age is presented in Table 2.

Table 2

**Analysis results of the daily ration of pre-school children living in urban conditions in Namangan region**

Indicators	Age of 3-7			Deviation from the norm, %	
	Phys.norm g/day	Winter-spring	Summer-autumn	Winter-spring	Summer-autumn
Fish product	25±1,25	0	0	Not included in the ration	
Egg	0,5±0,03	0,5±0,03	0,5±0,03	Conforms to the norm	

Milk products	548±27,4	258±13,4***	295±15,9***	-52,9	-46,2
vegetables	200±10	124±6,5***	178±9,6	-38	-11
Dry fruits	15±0,75	12,0±0,62**	10,0±0,5***	-20	-33,3
Fruits	168±8,4	148,0±7,7	160,0±8,6	-11,9	-4,8
Meat products	100±5	90,0±4,7	85,0±4,6*	-10	-15
Animal fat	20±1	20±1,0	15,5±0,8**	меъ. Мос	-22,5
Sugar	42±2,1	38,6±2,0	40,0±2,2	-8,1	-4,8
Bakery products	183±8,15	235±12,2**	215,0±11,6*	+28,4	+17,5
Vegetable oil	8±0,4	10,0±0,5**	10,0±0,5**	+25	+25
Potato	150±7,5	175,0±9,1	196±10,6**	+16,7	+30,7
Confectionery products	8±0,4	10,0±0,5**	6,2±0,3***	+25	-22,5

Note: \* - differences are significant compared to the indicators of the physiological norm group (\* - P<0.05, \*\* - P<0.01, \*\*\* - R<0.001)

As can be seen from table 2, the daily ration of children living in the urban conditions of Namangan region and being brought up in pre-school educational institutions does not meet hygienic requirements. It was found that the amount of bread and bakery products in the daily ration is 28.4% more than the standard level in the winter-spring season, and 17.4% in the summer-autumn season.

It can be seen that the daily energy consumption is mainly covered by bread and bakery products, that is, daily bread, pasta and rice products. The analysis showed that the standard level of bread and bakery products was covered and over-consumption was based, especially on the basis of daily bread consumption.

The role of calcium in milk and dairy products is important in the growth and development of preschool children, the formation of organs and systems, the increase in the density of bone tissue, and the prevention of osteoporosis in adulthood [13, 20 22, 23, 24].

In the daily ration of children of preschool age, milk and milk products are provided for 47% in the winter-spring season, and 52.9% in the summer-autumn season. These products were consumed 53-47% less than the norm.

The analysis of the daily ration of preschool children shows that fish and fish products are not included in the daily ration of the supervised children's institutions.

Hygienic analysis of the daily diet shows that the analysis of a number of scientific works carried out in our country shows that meat and meat products are consumed less than 35-40% in the daily diet of children and adolescents [17, 15]. In the daily ration of the institutions we checked, it was found that it is 10-15% less in the same order.

The diversity of analyzes and seasonal differences show that the amount of sugar decreased by 7.9-4.8% during the day, while confectionery products were 25% more in the winter-spring season, and 22.5% less in the summer-autumn season. determined.

The analysis of the daily diet of preschool children shows that the amount of fruits and vegetables, a source of vitamins and minerals that should be adequately provided to the children's body, is significantly less compared to other products. The amount of fruits in the daily ration is 12-4.8% less during the year, and the amount of vegetables is 11-38% less.

It was found that the amount of animal fat in the daily ration of children of preschool age corresponds to the standard level in the winter-spring season, and it is 22.5% less in the summer-autumn season, while the amount of vegetable oil is 25% more throughout the year.

It should be noted that the amount of basic food products in the daily ration of preschool children living in urban conditions in Namangan region does not meet the specified requirements.

The amount of basic food products in the daily diet of children of preschool age living in the rural conditions of Namangan region is presented in Table 3.

**Table 3**

**Results of the analysis of the daily ration of pre-school children living in rural conditions in Namangan region**

Indicators	Age of 3-7			Deviation from the norm, %	
	Phys.norm g/day	Winter-spring	Summer-autumn	Winter-spring	Summer-autumn
Fish product	25	0	0	Included to the ration	
Animal oil	20	20,0±1,1	20,0±1,1	Conforms to the norm	
Egg	0,5	0,5±0,03	0,5±0,03	Conforms to the norm	
Milk products	548	365±19,7***	375±21,4***	-33,4	-31,6
Dry fruits	15	10,0±0,5***	10,0±0,6***	-33,3	-33,3
Vegetable	200	149±8,0***	160±9,1**	-25,5	-20,0
Fruits	168	145±7,8	155±8,8	-13,7	-7,7
Sugar	42	39,6±2,1	40±2,3	-5,7	-4,8
Meat product	100	98,0±5,3	100±5,7	-2	In the norm
Bakery product	183	245±13,2***	225±12,8***	+33,9	+23,0
Confectionery product	8	10,0±0,5**	8,0±0,5	+25	In the norm
Potato	150	170±9,2	190±10,8*	+13,3	+26,7
Vegetable oil	8	9,0±0,5	10,0±0,6*	+12,5	+25,0

Note: \* - differences are significant compared to the indicators of the physiological norm group (\* - P<0.05, \*\* - P<0.01, \*\*\* - R<0.001)

Table 3 shows that fish and fish products are not included in the daily diet of preschool children living in rural areas of Namangan region.

Analysis of the literature shows that fish and fish products in the daily diet of children and adolescents are a source of omega 3- omega 6- fatty acids and vitamin D in the body [3, 14, 19]. Analyzes show that the absence of this product in the daily diet of children shows that conditions for the development of rickets have been created among them.

It was determined that the daily ration of children of pre-school age corresponds to the established norm of animal fats, i.e. butter and eggs. This had a positive effect on their physiological condition.

The amount of milk and dairy products is also lower than in urban conditions, but somewhat higher than the norm, but 33.4% less was consumed in the winter-spring season and 31.6% less in the summer-autumn season.

Although fruits are mainly a source of vitamins, dry fruits are a source of sufficient minerals, namely potassium. The amount of dry fruits was consumed less by 33.4% during the year. It was found that the amount of vegetables in the daily diet in the rural conditions was 25.5-20.0% less, the amount of fruits 13.7-7.7%, sugar 5.8-4.8% less.

The amount of bread and bread products in the daily ration ranges from 33.9 to 23.0%, confectionery products from 25.0% in the winter season, potatoes from 13.3 to 26.6%, and vegetable oil from 13.3 to 26.7 % consumed in excess.

The reason for the results is that in pre-school educational institutions in urban and rural conditions, the composition of the ration of insufficient and excessive products is similar to each other. The lack of basic nutrients in the daily diet, which has a negative effect on their nutritional and biological value, has been shown in the works of several authors.

The amount of micronutrients in the daily diet of children of preschool age is presented in tables 4-5.

Table 3

**Amount of the main nutrients in the daily diet of children of preschool age (3-7 years old) living in urban conditions**

Indicators	Seasons			Deviation from the norm, %	
	Phys.norm g/day	Winter-spring	Summer- autumn	Winter- spring	Summer- autumn
Proteins	54,0	48,2±2,8***	51,8±2,8***	-8,9	-9,6
Fats	60,0	54,5±2,9	53,5±2,8	-9,1	-8,9
Carbonated waters	261,0	279,5±14,0	277,8±15,0	+10,7	+10,6
Energy value	1800	1800	1800		
Minerals , mg:					
Calcium, mg	900	536±29***	764,4±42,8*	-40,4	-15,1
Phosphor, mg	800	857±46,3	901,5±50,5	+7,2	+12,7
Magnesium, mg	200	234±22,6**	267±14,9**	+16,9	+33,3
Potassium, mg	600	2598±140,3*	2862±160***	+333,0	+377,1
Natrium, mg	700	849±45,8*	1018±57***	+21,3	+45,5
Iron, mg	10	12,9±0,7**	14,4±0,8***	+29,0	+44,2
Iodine, mg	0,1	0,05	0,05		
Vitamins, mg:					
B <sub>1</sub> ,	0,9	0,5±0,05***	0,8±0,05	-44,4	-11,1
B <sub>2</sub>	1,0	1,0±0,06	1,0±0,06		
B <sub>6</sub>	1,2	0,8±0,07***	0,9±0,05***	-33,3	-25,0
B <sub>12</sub> , mcg	1,5	1,1±0,09**	1,2±0,07**	-26,7	-20,0

Niacin, mg	11	8,3±0,65**	9,7±0,57	-24,5	-11,8
A, mcg.ret/eq	500	240±29,5***	230±13,6	-52,0	-54,0
C	50	62,1±3,0**	70,3±4,2***	+24,2	+40,6
O:O:K regarding	1:0,9:4,8	1:0,82:5,79	1:0,96:5,36		

Hygienic analysis of the daily rations consumed by children in a preschool educational institution shows that proteins from the main nutrients in the daily rations were consumed by 91.1% of the norm in the winter-spring season and 90.5% in the summer-autumn season. , 8.91% less than 08, and it was determined that the amount of carbonated water is 10.7-10.6% more than the norm. The daily energy cost was 1800 kcal. It was found that the amount of calcium in the daily diet of children educated in pre-school educational institutions was 40.1% less in the winter-spring season, and 15.1% less in the summer-autumn season, and the amount of phosphorus was over-consumed from 7.2 to 12.7%. . The analyzes showed that the amount of phosphorus in the products was covered by products other than fish and dairy products. It was found that the amount of vitamins in the daily ration of children in preschool educational institutions decreased from 52.0% to 24.5% in the winter-spring season, and from 54.0% to 11.1% in the summer-autumn season. Among vitamins, ascorbic acid was found to be 24.2% to 40.6% more than sugar and confectionery products. The proportion of proteins, fats and carbohydrates in the daily diet was 1:0.82:5.79 in the winter-spring season, and 1:0.96:5.36 in the summer-autumn season. It shows the lack of fats and the excess amount of carbohydrates in the main food products.

According to the results of chemical analysis, the nutritional ration of children educated in pre-school educational institutions in Namangan city does not meet the hygienic requirements. It should be noted that the daily food ration in pre-school educational institutions where children live and are raised in urban conditions is not organized depending not only on the age of the children and the duration of their stay in the pre-school educational institution, but also on their health.

Table 5 shows the quantity and quality indicators of the main nutrients of preschool children living in Namangan region.

Table 5

### Amount of basic nutrients in the daily diet of preschool children living in rural conditions

Indicators	Age of 3-7			Deviation from the norm, %	
	Phys.norm g/day	Winter-spring	Summer-autumn	Winter-spring	Summer-autumn
Proteins	54,0	50,2±2,6	49,2±2,8	-9,3	-9,1
Fats	60,0	49,5±2,6*	55,9±3,2	-8,2	-9,3
Carbohydrates	261,0	288,8±14,3	275±15,0	+10,5	+11,0
Ccal	1800	1800	1800		
Минерал моддалар, мг:					
Calcium, mg	900	640±34,6***	644±26,1***	-28,9	-28,4
Phosphor, mg	800	935±50,5*	948±53,1*	+16,9	+18,5
Magnesium, mg	200	253±13,7**	251±14,1**	+26,5	+25,5

Potassium, mg	600	1519±136***	1512±141***	+219,8	+218,7
Natrium, mg	700	929±50,2**	926±51,9**	+32,7	+32,3
Iron, mg	10	13,0±0,7**	10,4±0,6	+30,0	+4,0
Iodine, mg	0,1	излари	излари		
Витаминлар, мг:					
B <sub>1</sub>	0,9	0,6±0,05***	0,7±0,04**	-33,3	-22,2
B <sub>2</sub>	1,0	1,0±0,06	1,1±0,06	0	+10,0
B <sub>6</sub>	1,2	0,8±0,07***	0,9±0,05***	-33,3	-25,0
B <sub>12</sub> , мкг	1,5	1,1±0,09**	1,2±0,07**	-26,7	-20,0
Niacin, mg	11	8,7±0,65*	8,8±0,52**	-20,9	-20,0
A, mcg.ret/eq	500	250±29,5***	360±21***	-50,0	-28,0
C	50	48,1±3,0	62,6±3,7*	-3,8	+25,2
O:O:K regarding	1:0,9:4,8				

Note: \* - differences are significant compared to the indicators of the physiological norm group (\* - P<0.05, \*\* - P<0.01, \*\*\* - R<0.001)

## CONCLUSION

As can be seen from table 5, it was found that the amount of proteins consumed by children in the preschool educational institution living in the rural conditions of Namangan region during the day was 9.3% less than the specified standard level in the winter-spring season, and 9.1% in the summer-autumn season. According to the daily ration, the amount of fats was consumed by 8.2 to 9.3% less, while the amount of carbohydrates was consumed by 10.5 to 11% less than the standard level. The daily energy value was 1800 kcal. Microelements and their place in the daily diet of children educated in preschool educational institutions has a special place. The amount of calcium was consumed less by 28.9% in the winter-spring season, and by 28.4% in the summer-autumn season. It was found that the amount of trace elements remaining in the daily diet was 16.9-219.8% excessive in the winter-spring season. In the summer-autumn season, it is 4.0-218.7% more. However, we should note that the iron content of the consumed products was shown to be non-heme iron. The role of heme iron, calcium and phosphorus in milk and dairy products is important in the growth and development of children. It was found that the quantity of microelements falling with these products is low. It was found that the amount of vitamins is less than 3.8 to 50.0% in the summer-autumn season, 20-28% in the summer-autumn season, and the amount of vitamin C is more than 25.2% by 210%. The ratio of proteins, fats and carbohydrates in the daily diet was 1:0.82:5.79 in the winter-spring season, and 1:0.96:5.36 in the summer-autumn season. The proportion of the main food products is determined to be low in fat and excess in the amount of carbohydrates. Taking into account the materials presented on the basis of a number of scientific results carried out in our country, it is necessary to carry out a number of tasks regarding healthy eating among children of preschool age, the formation of healthy eating habits and alimentary status of children, the quality and quantity of rations assessment of completeness requires perfect control of the main links of food organization. Based on the above analysis and identified shortcomings, we found it permissible to dwell on the following conclusions:



1. The daily ration of preschool children does not meet the hygienic requirements set in urban and rural conditions. Significant shifts were also found in the sequence of key nutrients and the amount of consumption during the week.
2. Fish and fish products are not included in the children's daily diet.
3. The main nutrients in the daily ration, i.e. proteins, are 8.9 to 9.6% less in the winter-spring season in urban conditions, and 9.3 to 9.1% less in the rural conditions, and the amount of fats is 9.1 to 9.1% in the winter-spring season Up to 8.9%, it was found to be less than 8.2 to 9.2% in rural conditions. It was determined that the amount of animal fats and vegetable oils is excessive in the composition of the diet.
4. It was found that the amount of carbohydrates in the daily ration of preschool children due to bread and bakery products is 10.7% in urban conditions and 10.5 to 11.0% in rural conditions.
5. In the daily ration of children, the amount of micronutrient calcium in urban conditions ranges from 15.1 to 40.4% throughout the year, and in rural conditions it is less than 28.4-28.9%, and the amount of non-heme iron micronutrient is 12.9-44.2 %; An excess of 30.3-4% was found.
6. The amount of vitamins of group V in the daily ration of children of preschool age is 26.7-44.4% in urban conditions in the winter-spring season, and 11.1-25.0% in the summer-autumn season, and in the same order in rural conditions 26 ,7- 33.3%; 20-25% less, 10% more vitamin V2.
7. Dairy products, cheese from meat products (chicken and rabbit meat), juices made from various pure fruits, salads made from pure vegetables, 5 grams of iodized salt allowed in the daily ration were not included in the daily diet.

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