



## Correlation Assessment of the Effect of Macronutrient Deficiency on The Organism of Children

**Choliyeva Muhayyo Azam kizi**

Teacher of the Medical Department of KarshiSU  
[muhayyoazamovna55@gmail.com](mailto:muhayyoazamovna55@gmail.com)

### ABSTRACT

Today, due to the lack of protein, carbohydrates and fats in food, the additional demand for macro and micronutrients among people is increasing. In particular, physical development is adversely affected as a result of inadequate intake of macronutrients. The spread of these indicators among age groups was found to be significantly lacking in macronutrients in young children among the population. As a result of our research, it was found that even in the group of 5-year-old children of preschool age, the need for proteins, carbohydrates and fats is not fully covered. The lack of macronutrients in the food is the reason for the reduction of the corresponding substances in the blood.

### Keywords:

Macronutrient, bromcresol method, protein, carbohydrate, fat, height, weight, albumin, hemoglobin, correlation.

**Introduction.** Regular and normal physiological processes of preschool children depend on their health, environment and a number of factors in their social life [7]. Protein, fat, carbohydrate, vitamins, and minerals are the main nutrients in food that are necessary to maintain health [9]. The entry of such macromolecules into the body and their assimilation by tissues and cells, their storage as a reserve of body parts, plastic functionally serving as a building material of cells is based on metabolism, which is a complex physiological process of the body.

Fulfilling the physiological standards of children's nutrition is a necessary condition for ensuring its rationality, harmonious growth and development of the child, and increases his immunity and the ability to adapt to the harmful factors of the living environment [5].

It is necessary to strengthen the hygienic control of the organization of preschool children's nutrition and this has two stages: 1) sanitary-epidemiological control of organized children's nutrition in preschool educational institutions and schools; 2) hygienic training of

parents and children themselves in the skills of rational nutrition [8; 10].

Dietary nutrition is very important for the moderate physical and mental development of children. Nutritional products not only meet the requirements of the body of different ages, that is, not only for maintaining vital processes, but also for sufficient growth and development, full of valuable proteins, fats, carbohydrates, mineral salts, water and it is necessary to ensure that vitamins are accumulated in the body as a reserve [3].

Therefore, it is necessary to maintain a certain proportion of proteins, carbohydrates and fats in the daily nutrition of children of different ages. Unfortunately, at present, the problem of malnutrition in children, especially protein deficiency, is emerging [5].

As of April 4, 2021, according to the World Health Organization, undernutrition in the Central Asian region in 2020 was 10% (9.1-11). This is 0.4% (9.5-11.4) less than in 2019, and 7.1% (16.3-18) less in the next 10 years [6].

**Materials and methods.** The study included a total of 20 5-year-old children in Kashkadarya region. In the study, 10 girls and 10 boys were randomly selected as controls. The study was conducted at the group level of socio-hygienic methods of studying the actual diet of the population, by filling out questionnaires in a planned manner.

Questionnaires were filled out by parents. The nutritional status of children for one week was studied. In the assessment of nutritional status, the results were evaluated using a statistical method. In this case, the data was processed in the MS Excell program developed on the basis of the tables of the chemical composition and energy value of food [2; 11].

Biochemical blood analyzes of children of this group were conducted in the clinical-biochemical laboratory department of the Regional Children's Multidisciplinary Medical Center. The concentration of hemoglobin protein (by the cyanmethemoglobin method), total protein (biuret method), albumin (bromocresol green method), glucose (enzymatic-colorometric test method based on glucooxidase), cholesterol (CHOD-PAP enzymatic-colorometric test method) in the blood was determined [1].

**The obtained results and their analysis:** the following results were obtained when the actual nutrition of a group of 5-year-old children was studied [4] (Table1).

**1 - table**

**Indicators of actual food composition of a group of 5-year-old children**

The amount of macronutrients in the food of 5-year-old children (in g)	A group of 5-year-old children n=20	P	Recommended daily food intake (in g)
Protein	51,5±1,98	p<0,001	68
Carbohydrate	250,2±10,3	p<0,001	272
Fat	54,9±1,65	p<0,001	68

Even in the group of 5-year-old children, there is a lack of macronutrients in the current diet. They consume 24.2% less protein, 8.01% less carbohydrates, and 19.2% less fat (Table 2)

**Table 2**

**The results of biochemical parameters of the blood content of a group of 5-year-old children**

Biochemical parameters of the blood of 5-year-old children n=20		P	Biochemical indicators in blood normal limits
Total protein	55,5±2,02	p<0,001	66-85 g/l
Albumin	33,1±0,75	p<0,001	35-55 g/l
Hemoglobin	113,5±2,69	p<0,001	120-160 g/l
Glucose	4,15±0,36	p<0,001	3,2-6,1 mmol/l
Cholesterol	4,30±0,23	p<0,001	<5,2 mmol/l

When we check the blood analysis, we can see that the biochemical indicators are reduced from the normal values in the body. It was found that total protein in blood serum decreased by 15.9%, albumin by 5.42% and hemoglobin by 5.41%. Glucose and cholesterol were found to be within normal limits (Table 3).

**Table 3**  
**Correlation of macronutrients in food and biochemical indicators in blood**

The amount of macronutrients in the food of 5-year-old children	Biochemical parameters of blood				
	Total protein	Albu min	Hemogl obin	Glucos e	Choles terol
<b>Protein</b>	r = <b>0,78</b>	r = <b>0,70</b>	r = <b>0,40</b>	r = - 0,49	r = - 0,12
<b>Carbohydrate</b>	r = - 0,35	r = - 0,37	r = 0,12	r = <b>0,82</b>	r = 0,15
<b>Fat</b>	r = - 0,12	r = - 0,12	r = 0,029	r = 0,27	r = <b>0,81</b>
p=0,05					

When calculating the correlations between biochemical indicators in blood serum and macronutrients in actual food, there is a strong linear correlation between protein in food and total protein and albumin in blood serum and a moderately strong correlation with hemoglobin protein is in a linear correlation relationship.

There is a strong linear correlation between dietary carbohydrate and blood

serum glucose, dietary fat and blood cholesterol. Therefore, a group of children randomly selected for these studies have problems related to nutritional status.

Height and weight of a group of 5-year-old children were measured in order to determine how the problems related to current nutrition affected the physiological indicators of children. The results are shown in the table below (Table 4).

**Table 4**  
**Results of height and weight indicators of a group of 5-year-old children**

Age and gender of children	Height (cm)	P	Weight (kg)	P
<b>5-year-old girls n=10</b>	104,2± 2,65	<0,0 010	17,2± 0,26	<0,0 010
<b>5-year-old boys n=10</b>	105,2 ± 3,35	=0,0 012	17,5 ± 0,45	<0,0 010

According to the standards of the World Health Organization, the recommended height for 5-year-old children is 109.4 ± 4.7 cm for girls and 109.9 ± 4.6 cm for boys. Weight is 18.2 ± 0.14 kg for girls and 18.3 ± 0.13 kg for boys.

In the data we received, it was found that the height of the 5-year-old girls was 4.75% lower than the norm and the weight was 5.5% lower. Height of boys decreased by 4.3% and weight by 4.4%.

**Conclusion.** There is a lack of macronutrients in the current food composition in the group of 5-year-old children. They eat 24.2% less protein, 8.01% less carbohydrates and 19.2% less fat. In the 5-year-old group, it was found that the height of the girls was 4.75% less than the norm, and the weight was 5.5% less. Height of boys decreased by 4.3% and weight by 4.4%. In the group of 5-year-old children, the total proteins in blood serum were correspondingly

reduced by 16% compared to the norm. Albumin protein in the blood serum of 5-year-old children decreased by 5.42% compared to the norm. In the group of 5-year-old children, the hemoglobin protein in the blood decreased by 5.41% compared to the norm.

## References

1. Dolgov V.V., " Clinical laboratory diagnostics ", national leadership, Moscow, ed. "GEOTAR-Media", 2012.
2. Zaitsev V.M., Lifyandsky B.G., Marinkin I.V. Practical medical statistics. Teaching aid. - St. Petersburg: Foliant, 2003. - 432 p
3. Tutelyana V.A., Konya I.Y. Children's nutrition: a guide for doctors - 3rd ed., Arabic. and dop. - M.: Medical Information Agency, 2013. - 744 p.
4. Physiological norms of the Republic of Uzbekistan for the support of healthy nutrition. SanPiN #0347-17. - Tashkent, 2017.
5. Edleeva A.G., Khomich M.M., Leonova I.A., Bogdanov V.A. Bioimpedance measurement as a method of the otsenki komponentnogo sostava tela u detey starshe 5 let // Detskaya meditsina Severo-Zapada 2011. - T. 2, No. 3. - S. 30-33
6. WHO Child Growth Standards Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age Methods and development. World Health Organization 2006
7. Razikova I.S. "Dietology" T.: "Science Development" 2018. -323 p
8. Saidov V.M. "Dietology" T.: "Economy-finance" 2008 year -255
9. Tilovov M.R., Turdiyev S.O., Bozorov A.M. Food hygiene. Study guide. T.: 2007-23-24 p.
10. Zakirkhodjayev Sh.Y., Sh.S. Bakhridinov, A.S. Khudaiberganov "Clinical nutritionology" study guide T.: "Yangi Kitab Zadashiya" 2021 year.-536 p.
11. Shaikhova G.I. Food hygiene. Study guide. T.: 2011 - 420 p.