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PROVISION OF MINERALS FOR PRIMARY SCHOOL STUDENTS IN RURAL CONDITIONS

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Abstract:

The article presents the results of a study of the current state of nutrition of students living in the southern regions of Uzbekistan. The level of supply of the subjects with calcium, phosphorus, magnesium, iron, zinc and iodine from macronutrients was studied by questionnaire. The results were compared with the normative indicators. The observed changes in the daily ration of the subjects were explained. Based on the results, appropriate conclusions were made and the necessary recommendations for the organization of healthy nutrition of schoolchildren in rural areas were given.

Keywords: *southern regions of Uzbekistan, mineral components, macroelements, microelements, current nutrition, questionnaire method, daily diet, healthy eating*

RELEVANCE OF THE TOPIC

The normal development and harmonious development of the younger generation is closely linked with their nutritional characteristics. Therefore, the study of the current nutrition of children and students has been and will remain one of the most pressing issues in the world. Numerous studies on the current nutrition of the population, as well as the results obtained from them, show that significant changes in the nutrition of students to one degree or another are often observed in the absence of essential nutrients.

Unfortunately, these changes are characterized by a negative impact on the level of health of the population under study, as well as on the normative growth and development (Egamberdiyeva G.O., 1992), (Lavrichenko, 2002), (Timofeyeva A.M., 2007). Despite the fact that it has been studied for many years, as well as a number of effective measures are taken, there are still many problems with proper nutrition of students (Zulkarnayeva, 2013), (Martinchik A.N. i dr., 2017), (Setko, 2019).

As a result of serious attention to this issue in our country, many positive results have been achieved in educating young people in a healthy and harmonious way. A number of decrees and resolutions adopted by our government in recent years pay special attention to the establishment of healthy nutrition of the younger generation, ensuring their normal development (O'zR Vazirlar Mahkamasining 251-son qarori;). However, there are still a number of problems in this area that need to be addressed (Ismailov, 1999), (Qurbonov, 2018), (O'zbekistondagi bolalar vaziyatining tahlili. UNICEF, 2020).

One of the factors that significantly affect the nutritional status of different groups of the population is the climatic characteristics of our country. In particular, this is clearly reflected in the nutritional status of students living in hot climates.

Taking into account the above-mentioned aspects, in the course of our research, the current nutrition of young schoolchildren living in the southern regions of Uzbekistan was studied. It should be noted that the nutritional characteristics of students living in the southern regions, such as Kashkadarya and Surkhandarya, have not been studied experimentally (Raxmatullayev, 2009), (Umedova, 2021).

MATERIALS AND METHODS

The questionnaire method was mainly used in the study of the current nutrition of students. Using this method, it is possible to study the current diet of any population group at different times of the year. In addition, socio-hygienic and purely hygienic methods related to the study of the current diet of the study group were used. Experts say that a combination of more than 10 experimental methods can be used to study the current nutrition of a single population group. In most cases, the researcher uses mixed methods appropriate to the circumstances (Petrov, 2015).

In other words, during each observation and inspection, a combination of simple and complex methods is used, based on the nature of the research. At the same time, the current state of nutrition of 62 students was studied using questionnaires and survey methods. The survey was conducted in the first week of March 2021. The subjects were 7-10 years old, 34 of them were girls and 28 were boys.

According to the questionnaire method, students recorded all the foods they consumed in whole week (including Sunday) in a special questionnaire. Initially, the students' parents and teachers were interviewed and assisted. After all the questionnaires were collected, the food consumed by each student during the week was summed up based on the information provided in them, and the amount of certain macro- and micronutrients in the products was determined. In this case, the chemical composition of food was calculated using special tables (Skurixin I.M. M. , 1987), (Petrov, 2015). Windows Microsoft Excel 2010 was used in the mathematical calculation of the data in the questionnaires, and Windows Origin 6.1 was used in the statistical processing of the results. The obtained results were studied in comparison with the normative indicators set for this age group (Xudayberganov, 2017) and appropriate conclusions were drawn.

RESULTS AND DISCUSSION

Our initial research on the actual nutrition of primary school students is reflected in Tables 1 and 2 below. In particular, Table 1 shows the supply of macronutrients to the subjects.

Table 1.

Provision of macronutrients to 7-10 year old students

Minerals	**Quantity**	**Results**	**Difference from the norm**	
			In numbers	**In percent**
Calcium, Sa (mg)	1100	662,6±114,1	- 437,4	60,2
Phosphorus, R (mg)	1650	1221±21,2	- 429	74
Magnesium, Mg (mg)	250	390,8±6,4	+ 140,8	156,3

It was found that the amount of calcium and phosphorus in the daily diet of schoolchildren is much lower than the norm. In particular, the daily intake of calcium was 60.2% of the norm (662.6 ± 114.1 mg instead of the norm of 1100 mg), and the amount of phosphorus was 74% (1221 ± 21.2 mg instead of the norm of 1650 mg). This situation can be explained by a significant shortage of milk and dairy products in the daily diet of students. In addition, the subjects consumed less food than usual with legumes such as beans, peas, and mung bean. This is because hot dogs, as well as pastries such as manti, lagman, chuchvara, pasta, play a key role in the respondents' diet. Dairy products are mainly kefir/yogurt. Due to these factors, it can be said that there is a deficiency of essential elements such as calcium and phosphorus in the daily diet of schoolchildren.

The amount of magnesium from macronutrients in the daily diet of the subjects was much higher than normal, ie 156.3% (390.8 ± 6.4 mg instead of the normal 250 mg). This remarkable situation is explained by the abundance of bread, pastries, as well as rice dishes (shavla, mastava, pilaf) and dried fruits such as almonds, walnuts in the daily diet of students.

In Table 2 below, we present the micronutrient supply status of the subjects.

Table 2.

Provision of micronutrients to 7-10 year old students

Minerals	**Quantity**	**Results**	**Difference from the norm**	
			In numbers	**In percent**
Iron, Fe (mg)	12	14,3±0,4	+ 2,3	119
Rux, Zn (mg)	10	7,8±0,13	- 2,2	78
Iodine, J (mkg)	120	133,9±4,8	+ 14	111,6

As can be seen, a number of peculiarities can also be observed in the case of the provision of micronutrients to their students. In particular, the respondents' demand for trace elements of iron and iodine was met by 119 and 111.6%, respectively. That is, the amount of iron element taken with a norm of 12 mg is 14.3 ± 0.4 mg, and the amount of iodine taken with a norm of 120 mcg is 133.9 ± 4.8 mg. This excess of iron can be explained by the abundance of bread, spinach, various sweets and chocolates in the daily diet of students. Excess iodine levels may be due to excessive consumption of certain products, such as spinach and various other greens, as well as eggs, mainly in early spring. The amount of zinc in the daily diet of the subjects was much lower than the norm, ie 7.8 ± 0.13 mg instead of the norm of 10 mg (78% of the norm). Such a shortage can also be explained by the relatively low content of legumes, legumes, cereals and liver, meat products in the daily diet, as mentioned above. Such a shortage can also be explained by the relatively low content of legumes, legumes, cereals and liver, meat products in the daily diet, as mentioned above.

Based on the regional and national specifics of our country, it is expedient to interpret the above results as follows.

First of all, it should be noted that most villages in the southern region of Kashkadarya oasis have their own national and ethnic cuisine. In particular, in the village of Novkat, Kasbi district, where we conducted a study, there is a national and regional diet that suits the mentality of the population. Therefore:

- First, bread and bakery products, pastries are widely consumed among the rural population. Importantly, the majority of the population is more receptive to large loaves of black bread made from it. Such bread is rich in elements such as iron, copper, iodine and magnesium. This situation is consistent with the indicators in the results we obtained;
- Secondly, when re-analyzing the questionnaires from schoolchildren, it is clear that the share of some local foods and products in the daily diet of the subjects is very high. In particular, a large part of the ration consists of rice dishes mastava, shirguruch, pilaf, and pastries - manti, chuchvara, pasta, somsa. The abundance of such foods in the daily diet depends on the long-term national values, customs and living conditions of the rural population. In particular, the fact that the rural population is constantly engaged in field work, as a result of which they expend a lot of energy, encourages them to consume more of the said strong foods. This, in turn, affects the level of macro- and microcomponents supply of students, as well as adults.
- Third, another point to note is that the subjects consumed a lot of dried fruits such as almonds, walnuts. This is due to the fact that these fruits, including almonds, are grown in large quantities in Novqat and neighboring villages of Kasbi district. This is an important indicator in the nutrition of the rural population and in turn in meeting their demand for certain minerals. In our study, an increase in magnesium in the daily diet of students by more than 1.5 times the norm (156.3%) may be due to the consumption of large amounts of almonds.
- Fourth, legumes such as beans, peas and mung bean are relatively rare in the daily diet of students. It should be noted that legumes contain a large amount of macro- and microelements, as well as vegetable protein. Accordingly, it is advisable to increase the number of legumes in the daily diet of each population group, including students.
- Fifth, since our research was conducted in early spring, especially in the first week of March, the role of spinach in the diet of schoolchildren is special. It is known that in the early spring in our villages, as well as in urban areas, it has become a common habit to prepare and eat a variety of dishes from freshly cut greens. The same thing can be witnessed in our research. According to the survey data, schoolchildren consumed significantly more spinach. It is natural that this dish is easy to prepare and the product is much cheaper, so it is more in the daily diet of the population. According to special tables on the chemical composition of food, the content of iron in spinach is several times higher than in other greens (Skurixin I.M. M. , 1987), (Skurixin I.M. V. , 2002). Therefore, according to our results, it is safe to say that the presence of sufficient amounts of iron and iodine in the daily diet of students is primarily due to the high consumption of spinach somsa.
- Sixth, it should be noted that milk and dairy products do not play a significant role in the daily diet of students. This can be assessed as a negative indicator for these rural conditions. Because in rural areas there is every reason to say that milk and dairy products are enough, because almost every farm has dairy cows. However, due to the incomplete food culture among the local population, not enough attention is paid to the preparation and consumption of various dairy products. As a proof of our opinion, we have witnessed that in the questionnaires of the students we conducted, mainly kefir/yogurt and partially butter were mentioned. This naturally leads to a deficiency of calcium and phosphorus, which are present in large amounts in milk and dairy products.

It is obvious that it is not always rational for the population to eat only according to national traditions or according to the requirements of local conditions. In order to organize a healthy diet for various groups of the population, including schoolchildren, we consider it expedient to study in depth the current nutrition of people with the help of research and to establish science-based healthy eating measures based on the results obtained.

CONCLUSION

The generalized analysis of the collected data shows that the current nutritional status of school students is formed in close connection with the specific nutritional characteristics of the region in which they live.

Some of the nutritional deficiencies observed in schoolchildren have a negative impact on their growth, development and health. In particular, a deficiency of calcium and phosphorus in the daily diet can lead to the normal formation of the musculoskeletal system, and a deficiency of the element zinc can lead to significant changes in the nervous system and mental activity. In order to prevent such cases, it is advisable to increase the amount of milk and dairy products in the daily diet of students. In order to overcome zinc deficiency, it is necessary to consume sufficient amounts of legumes, liver, meat products. Grasses grown from grains are also rich in the element zinc. In the spring, a variety of dishes (for example, sumalak) can be prepared from such harvested grass.

It can be said that an excess of elements such as iron, iodine or magnesium does not pose a serious risk to students. Research in the field of nutrition shows that the excess of nutrients, including minerals, taken through natural products is likely to adversely affect the digestive process. Therefore, there is no need to worry about more than 1.5 times the amount of magnesium in the daily diet of students.

Advocacy plays an important role in the organization of healthy and rational nutrition of students. One of the necessary measures is to familiarize students with the rules of proper nutrition, to develop in them the appropriate skills and competencies in this regard. Such activities (especially the distribution of picture booklets, handouts, etc.), especially in the primary grades, serve as an important factor in the formation of concepts about proper nutrition, as well as to increase their awareness and imagination

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