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## THE ANALYSIS OF NUTRITION OF CHILDREN OF ANABARSKY DISTRICT OF THE SAKHA REPUBLIC (YAKUTIA)

### ABSTRACT

The article presents the results of a study of the diets of students living in the village of Saskylakh, Anabarsky district of the Sakha Republic (Yakutia). The authors assessed the nutrition and health status of 103 children of schoolchildren from 6 to 10 grade. The analysis of the diet of school-age children in Saskylakh has been carried out using a questionnaire method.

As a result of the analysis of the obtained data, it was established that children eat meat (94.1%) or fish (50.4%) with pasta (64%) every day or several times a day. One of the characteristics of children in the Arctic region is that children eat more often than children from the central regions of the RS (Ya) region raw foods (meat and fish). This is fresh meat or fish caught by frost and not losing juice. It is planned with thin long shavings and is called planed. Of the meat products, game birds predominate - polar quails, ducks, geese, and eggs of migratory birds (the same ducks and geese) - complete the grocery range of subarctic cuisine. It has been revealed that schoolchildren do not consume enough milk and dairy products, since many in the Arctic region do not keep a household and do not contain cows. Eggs, vegetables (mainly potatoes) and fruits are consumed in small quantities, as they are of short storage and are delivered only by flight to the northern regions. As for the use of salt by schoolchildren, it was clearly excessive. Most schoolchildren prefer to eat: salty (50.4% of respondents), not salty (23.3%), spicy (26.3%) foods. This fact is aggravated by the fact that, as shown by survey data, many schoolchildren often eat sweets, carbonated drinks and excessive amounts of salt.

As part of this study, we also examined children and identified the morbidity structure of the child population in Saskylakh.

In the first place, endocrine pathology was detected in 62.1%, which is most likely due to the endemicity of the territory due to its low iodine content.

In second place, dental pathology was found in 58.2%. Dental pathology in the Anabarsky district is worsening, which in winter people use ice, where fluoride concentration is even lower than in the water itself.

In the third place is the disease of the musculoskeletal system (32%). In the Anabarsky region, a short and cold summer is complemented by strong winds; in winter there is a blizzard, which always becomes an obstacle to any movement. Lack of nutrients and extreme climatic conditions, lifestyle affect the development of the musculoskeletal system in children in the Anabarsky district.

The results revealed that the nutrition of schoolchildren living in the Arctic conditions has its own characteristics.

Based on the obtained results, conclusions and recommendations on optimizing the nutrition of school-age children were made.

**Keywords:** nutrition, schoolchildren, Republic Sakha (Yakutia).

**Introduction.** Extreme conditions of living in the North demand higher standards of man's health, and providing effective life activity of population of this region, especially balanced nutrition, gets main social and medical significance. Epidemiological surveys, having been held in different regions of Russia, suggest about significant nutritional disorders and pupils' health. These disorders include irrational proportion of main nutrient materials, subnormal content of saturated aliphatic acids, vitamins, macronutrients and minerals (calcium, ferrum, iodine and others), dietary fibers. Overconsumption of bakery products, salt and added sugar is being noted everywhere. Health indicators and anthropometric characteristics of children and adolescents are declined due to violation of dietary intake's standards [6-10].

**Aim of research:** Analysis of the diet of school-age children in Saskylakh village of Anabarsky district, the Republic of Sakha (Yakutia).

**Materials and methods.** In order to consider the attitude of schoolchildren to a rational diet, we conducted a questionnaire. We have included in the structure of a continuous sample of schoolchildren from 6 to 10 forms of Saskylakhsky

secondary school in the amount of 103 pupils.

**Results.** As a result of the analysis of the obtained data, it was established that children eat meat (94.1%) or fish (50.4%) with pasta (64%) every day or several times a day (See the table 1). Mostly boiled, also children eat raw foods (meat and fish). This is fresh meat or fish caught by frost and not losing juice. It is planned with thin long corrugated slices and it is called *stroganina*. Sometimes the game birds - polar partridges, ducks, geese and eggs of migratory birds (the same ducks and geese) - complete the product range of subarctic cuisine. Local children eat fish (chir, muksun, etc.). Raw fish from chyr and muksun, salted, dried in the sun and wind, frozen is served. An independent dish is fish roe.

The questionnaire of children shows that they often eat the roe of northern fish. It is lightly salted, add onions or garlic, black pepper, filled with vegetable oil. Milk and dairy products are sufficiently consumed, who has a private household (they have a cow).

It was found out that schoolchildren drink milk and dairy products in insufficient quantities - in the overwhelming majority of cases (75.7%) children drank

only 1-2 glasses several times a week, mostly only 1-2 times a week. At the same time, eating of sweets, chocolates by schoolchildren was clearly redundant - among the answers the most frequently mentioned options were 3-4 pieces and a lot of sweets, which significantly exceeds the recommended amount (Table 2). An egg, vegetables (mainly potatoes) and fruits are consumed in small quantities, as they are of short storage and are delivered only by flight to the northern districts. The data presented in the table shows that from the surveyed schoolchildren (70%) they consumed only 1-2 eggs 2 times a week, daily - 11.6% and several times a day - 11.6%, in general, they eat an egg only 23.2% of respondents. Vegetables, mainly potatoes, are consumed daily only by 11.6%; no one eats fruits every day. Only 23.3% of them eat twice a week. As for the use of salt by schoolchildren, it was clearly excessive.

Most schoolchildren prefer to eat: salty (50.4% of respondents), not salty (23.3%), spicy (26.3%) foods. This thing is compounded by the fact that, as shown by the survey data, many schoolchildren often eat sweets, carbonated drinks and an excessive amount of salt.

As part of this study, we also exam-

Table 1

## Food ration of schoolchildren of Anabarsky district. Saskylakh village

Food products	Proportion of school children in %				
	Several times a day	Daily	Several times a week	Several times a month	Less than 1 time per month
Meat products		90.3	5.8	0	0
Milk and dairy products	2.9	8.7	75.7	7.7	4.8
Vegetables	0	11.6	49.5	23.3	14.2
Fish and fish products	11.6	38.8	31	14.5	3.8
Eggs	11.6	11.6	28	29	19.4
Fruits	0	0	23.3	37.8	38.8
Butter	36.8	39.8	17.4	0	5.8
Pasta	23.3	40.7	26.2	4.8	4.8
Cereals	3.8	11.6	40.7	23.3	20.3
Sausage products	1.9	17.4	64	13.5	2.9
Sweets, chocolates	17.4	35.9	34.9	11.6	0
Carbonated drinks	3.8	14.6	29.1	37.8	14.6
Natural juices in tetrapacks	5.8	14.5	28.1	39.8	11.6
Roast	17.4	17.4	54.3	16.5	2.9
Farinaceous dish	4.8	9.7	66.9	11.6	6.7

Table 2

## Distribution of surveyed schoolchildren in accordance with the amount of food consumed(%)

Food products	1,2 pieces	3,4 pieces	Many	Not eat
Sweets	30.1	23.3	46.6	0
Chocolate	34.9	41.7	23.3	0
Egg	70	25.2	4.9	0
Bread	33	38.9	28.1	0
Biscuit	28.1	38.8	28.1	0
Sugar	65	11.7	23.3	0
Pancakes, meat patties	29.1	21.4	49.5	0

Table 3

## Pathology profile of the child population of Saskylakh, Anabarsky district

Disease	Number of pupils	
	abs.	%
Endocrine Diseases	69	66.9
Respiratory diseases	17	16.5
Diseases of the digestive organs	18	17.4
Diseases of the musculoskeletal system and connective tissue	33	32
Diseases of the nervous system	15	14.5
Eye disease	27	26.2
Diseases of the cardiovascular system	16	15.5
Dentistry	60	58.2

ined children and identified the morbidity structure of the child population of Saskylakh, Anabarsky district of the Sakha Republic (Table 3).

Endocrine pathology is mainly represented by endemic goiter 1-2 degrees in 62.1%. This is due to the endemicity of the territory of the Republic of Sakha according to the iodine content and the presence of endemic goiter [3]. Thyroid endemia is most widespread in the Urals, the North Caucasus, Altai, in the Far East and Siberia, the Upper and Middle Volga region, as well as in the Central region of the European part of the country [4, 5]. There is a number of epidemiological studies on the prevalence of endemic goiter in Yakutia, however, these studies were completed in the period up to 2000. [1,2,3].

Dental pathology was found in second place in 58.2% and was mainly represented by multiple caries in 33.9% of those examined.

It is known that one of the factors for the development of caries is a low concentration of fluoride in drinking water.

In winter, the population consumes ice, where the concentration of fluoride is even lower than in the water itself. It was also determined excessive consumption of sweets and candies by many children.

In the third place is the disease of the musculoskeletal system (32%), mainly represented by a violation of posture in 28.1%. The Republic of Sakha (Yakutia) belongs to the regions of the Russian Federation that has unfavorable children's health indicators. It is connected with extreme climatic conditions, and with the peculiarities of nutrition and lifestyle of the population [10].

**Conclusion.** Nutrition of children and adolescents in Anabarsky District of the Republic of Sakha (Yakutia) has its own regional characteristics, which are characterized by the presence of a deficiency in the main components of food, an imbalance in the nutrient composition. Rations do not have a variety of foods and dishes, characterized by inadequate consumption of basic ones, such as dairy products, eggs, vegetables, fruits. According to the results of the questionnaire of schoolchildren, it was revealed that dairy products, egg, vegetables and fruits consume less than half of the surveyed schoolchildren daily. It should also be noted that the daily consumption of fruits and vegetables does not work for many of the respondents.

Thus, a questionnaire conducted by

schoolchildren has made it possible to establish that the rare use of some products is related to the lack of products for sale, the high cost and the rare import of some products due to the transport infrastructure of the Arctic regions of the Republic of Sakha (Yakutia).

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## ETHNICITY-DEPENDENT EVALUATION OF EXCESSIVE BODY MASS AND OBESITY IN THE NATIVE POPULATION OF NORTHERN YAKUTIA

#### ABSTRACT

In the expeditionary conditions in the North of Yakutia, representatives of the indigenous population (Evenks, Dolgans, Evens, Yukagirs, Chukchi, Yakuts) were examined in order to identify overweight and obesity. Overweight in terms of BMI ranged from 27.1% in Dolgans to 37.8% in Yakuts, and there were no significant differences, more often it was observed in men. Obesity was significantly more common in the Evenks compared with the Evens, the Yukagirs and the Chukchi, the Yakuts compared with the Evens and the Chukchi, and the Dolgans compared with the Chukchi. Women suffered most often.

The mean values of systolic blood pressure in Evenks and Yakuts were higher compared to other ethnic groups. There was a high frequency of hypertension in all ethnic groups. A strong positive correlation of BMI with the level of systolic blood pressure was revealed.

**Keywords:** overweight, obesity, arterial hypertension, indigenous people, arctic zone, Yakutia.

**Introduction.** Excessive body mass and obesity had large-scale implications over the past few decades, contributing to mortality, affecting it directly and indirectly. Among the main causes of death in people with obesity are cardiovascular diseases (CVD). There is an increase in overweight and obese population in many developed countries. We analyzed medical examination data of 20,607 people aged 25–65 years in 12 regions of the Russian Federation, the prevalence of hypertension equaled to 41.6%. In the north of Russia, in particular in the Tyumen region, a high frequency of arterial hypertension (AH) (49%) and obesity (40.3%) was noted as part of a multicenter observational study of ESSE-RF. Previously, numerous studies have been conducted using the definition of body mass index (BMI) in the indigenous population of Yakutia, in particular Yakuts, where a relatively low incidence of increased body mass and obesity was noted compared with the non-native population. But in recent years, many researchers have noted their growth among the Yakuts, as well as among certain groups of indigenous minorities of Yakutia, particularly the Evenks, Evens and the Dolgans. Changes in the traditional lifestyle of the indig-

nous people of the Arctic zone of Yakutia led to "diseases of civilization", such as hypertension, diabetes, obesity, etc.

**Objective:** to assess the frequency of ethnicity-dependent overweightness and obesity among the indigenous population of Northern Yakutia.

#### Materials and research methods.

The collection of study material was carried out in the expeditionary conditions in the north of Yakutia, including the places of compact residence of the indigenous peoples. For a comparative analysis, 6 groups of 529 people, representatives of the indigenous population (Yakuts, Evenks, Evens, Dolgans, Chukchi, Yukagirs) were formed: 1st - Evenks (n = 67), of whom 13 were men, 54 were women; 2nd - Dolgans (n = 85), of whom 26 were men, 59 were women; The 3rd is the Evens (n = 141), of whom 51 were men, 90 were women; The 4th is the Yukagir (n = 77), of whom 34 were men, 43 were women; The 5th is the Chukchi (n = 40), of whom 20 were men, 20 were women; The 6th group is the Yakuts (n = 119), of which 30 were men and 89 were women. The average age of the respondents was  $45.59 \pm 0.55$  years.

Exclusion criteria: representatives of non-indigenous nationalities.

The research program included following sections: a survey to assess the general state of the respondent; the informed consent of the respondent to conduct research (according to the protocol of the Ethics Committee of the YSC CMP); anthropometric examination with height and weight measurement. Growth was measured in the standing position without shoes using a stadiometer with an accuracy of up to 0.5 cm. To measure body weight, we used mechanical physician scales that passed metrological control. The weight was recorded with an accuracy of up to 100 g. For further analysis, the traditional indicator was used - body mass index (BMI) or Quelet index, which was calculated by the following formula [Khaltaeva ED, Khaltaev NG, 1982, Pyoral K. et al., 1994]:  $BMI (kg / m^2) = \text{body weight (kg)} / \text{height (m}^2\text{)}$ . Overweight was considered to be a  $BMI \geq 25$  and  $<30 kg/m^2$ , obesity was determined at a  $BMI$  of  $\geq 30 kg/m^2$  [according to European recommendations of the III revision, 2003]. Blood pressure was measured on the right arm in a sitting position after 5 minutes of rest with an OMRON M2 Basic tonometer. The level of blood pressure was measured twice with an interval of about 2-3 min-