Items of Optimizing the Structure of the Population Nutrition and Improving the Quality and Safety of Food Production in the Republic Sakha (Yakutia)

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ABSTRACT

The article presents the results of long-term monitoring studies on dietary nutrition and dietary habits of different population groups and the analysis of the control of the conformity of the quality and safety of food products, according to the legislation of the Russian Federation, the legislation of the Customs Union and the standardized methods used in population-based epidemiological studies. The authors justify necessity of optimizing the structure of the population nutrition and improving the quality of food and the level of its security. They consider the complex of the factors influencing the increasing interest of the food industry to ensure the safety of their products.

Objective: a comprehensive assessment of actual nutrition and dietary habits, as well as the analysis of the quality and safety of primary and food products in the Republic Sakha (Yakutia).

Research Materials. Actual nutrition of the population of the Republic was estimated based on study data obtained from random stratified by sex and age samples of the population aged 25-64 years (560 people). Frequency method and the daily, memory recalling, method («24 h-recall») were used. Statistical processing and analysis were performed using the statistical program SPSS.

Research results. According to the results of scientific research Nutrition Center Health Research Institute NEFU named after M.K. Ammosov actual nutrition of the population in dynamics over the last ten years can be described as unsatisfactory.

Conclusion. The energy value of the ration for a 10-year period decreased by 2012 on 11% and amounted to an average 1885.7 kcal. The greatest reduction in caloric occurred in an industrial area (1.797 kcal), the lowest - in the Arctic (2020 kcal). The average daily intake of protein, fats and carbohydrates for a 10-year period did not change significantly, remaining well below the recommended physiological norms. A significant deficit in potassium, magnesium, calcium, iron, vitamins B1, B2, C, PP, retinol remains.

Keywords: monitoring, diet and consumption of food caloric value, the quality of food products and food safety, sanitary-chemical, microbiological, parasitological, radiological indicators.

INTRODUCTION

Rational healthy nutrition is one of the main factors that determine the health of the nation, ensuring normal growth and development of children, life extension, and disease prevention.

It is very important to know, why the foods we decide to eat today affect our health not just today, but many years later in our lives.

Priority issues of nutrition science in Russia today become assessment of nutrition and nutritional status of children and adults; its impact on health, the rationalization of nutrition. The results of large-scale epidemiological studies have established the most important violations of status: the excessive consumption of animal fats and the lack of polyunsaturated fatty acids, high-grade (animal) protein, most of vitamins, minerals (calcium, iron), trace elements (iodine, fluorine, selenium, zinc) and dietary fibers [1, 4].

The Russian Federation has adopted a number of basic legal acts aimed at ensuring the country's system of healthy eating, including: the laws "On sanitary and epidemiological welfare of population", "On Consumer Rights Protection", "On the quality and food safety", "On basis of health protection of the Russian Federation". Presidential Decree from November 17, 2008 № 1662-r approved the Concept of Long-Term Socio-Economic Development of the Russian Federation for the period up to 2020, one of the ways to implement the task of improving the health care system is the creation of a culture of healthy eating. Legislation acts are supported by a number of regulations of the Government of the Russian Federation, such as the Food Security Doctrine of the Russian Federation, the State Policy of the Russian Federation in the field of healthy nutrition for the period up to 2020 and plans to implement them.

National legislation is improved in terms of harmonization with international documents in the field of healthy nutrition, such as the WHO Global Strategy for Food Safety, "Global Strategy on Diet, Physical Activity and Health", set of recommendations on the marketing of foods and non-alcoholic beverages for children, European strategy for the Prevention and Control of Noncommunicable Diseases and others.

Within the framework of the WTO accession Russian Federation accepted an obligation that all sanitary measures will be developed in the Russian Federation, and the competent authorities of the Customs Union, in accordance with the WTO Agreement and, in particular, the Agreement on Sanitary and Phytosanitary Measures. Particular importance in connection with Russia's WTO accession is given to rapprochement of Russia and the Customs Union with foreign requirements under the Codex Alimentarius [2].

Objective: a comprehensive assessment of actual nutrition and dietary habits, as well as the analysis of the quality and safety of primary and food products in the Republic Sakha (Yakutia).

STUDY MATERIALS

Actual nutrition of the population of the Republic was estimated based on study data obtained from random stratified by sex and age samples of the population aged 25-64 years (560 people). Frequency method and the daily, memory recalling, method («24 h-recall») were used. Statistical processing and analysis were performed using the statistical program SPSS.

Sectoral annual reporting statistical form №18 «Information on the health status of a subject of the Russian Federation" for 2007-2013, Statistical compilation "Socio-economic status of the RS (Y)" for 2000-2011, Government reports 2007-2013.

STUDY RESULTS

According to the results of scientific research Nutrition Center Health Research Institute NEFU named after M.K. Ammosov actual nutrition of the population in dynamics over the last ten years can be described as unsatisfactory. Regardless of the various population groups inadequate intake of foods containing animal protein and excessive consumption of sugar-containing products were identified. We determined a low energy value of diets in comparison with physiological norms, defined increased carbohydrates contribution in dietary energy. We also revealed a low provision of rations by almost all studied vitamins and minerals, almost 100% lack of some micronutrients was observed.

11 groups of products, according to the questionnaire on the frequency of consumption of certain foods, were under study [3, 4].

Among the products consumed daily or 3-6 times a week, sausages were 61%, meat – 71, milk – 32, fish - 37, potatoes - 38, other vegetables – 34, fruits - 14, cereals and pasta - 43, bread and bakery products - 94, sweets - 19%.

In studying the rations there were differences in the daily caloric capacity among the respondents according to gender and ethnicity. Daily energy intake for men was 2308, women - 1801.3 kcal ($p < 0.05$). Caloric value of the indigenous population ration was significantly higher than that of non-indigenous (1787.1 and 2129.2 kcal, respectively, $p < 0.05$).

The highest caloric diet was observed in the Arctic and industrial districts, low – in the agricultural ones. It should be noted that the energy intake of the inhabitants of the republic is below the recommended standards (2500 kcal).

According to the norms of physiological needs nutrients and energy for different groups of the population of Russia (Ministry of Health, Moscow, 2008) for the northern regions are established energy needs of the population up to 10-15%, as compared to other climatic zones. In this case, we recommend the following ratios of the nutrients on calorie: protein - 15%, fat - 35 and carbohydrates - 50%.

On average, the share of the Republic of proteins and fats in the diet is less than the recommended standards, and the proportion of carbohydrates in all districts exceeds the required 50%, especially in the agricultural (up 65.1%), the republic's population consumes on average 64 grams of protein per day (75 g in the norm), which is below the recommended values by 16%.

On average population of the country consumes 72 g fat (83 g in the norm). In the industrial, Arctic and agricultural districts fat intake was 312, 345, 339 g day, respectively, while the contribution of fat in the dietary energy in these areas exceeds the recommended 50% and compounds 58; 61.5; 58%, respectively.

It is revealed that on average the population consumes 113.5 grams of meat and meat products per day; the annual consumption on an average is 41.4 kg. The recommended rate per capita in Russia is 83 kg / year. Thus, the consumption of meat and meat products of the country's population is twice lower the recommended standards.

Consumption of fish and fish products in the country is substantially lower (3-fold) of the existing norms of consumption (8.6 kg / year, compared with 23.7 kg / year). For the consumption of vegetable oil figures for the whole country is closer to the norm, but there are districts where consumption is 23 g / day versus the recommended 37.3 g / day.

According to the norms of good nutrition in the average adult needs to consume 404 kg / year of dairy products (milk equivalent). Population on average consumes 297.7 g / day, i.e. 108.7 kg / year per capita, which is almost 4 times lower than the recommended norm. In this case there are districts, where the difference is 6 or more times.

For the consumption of bread and bakery position is just the opposite, there are areas where the population consumes 453 grams per day versus 239 g recommended. It is clear that the population makes up for the lack of the main products at the expense of grain products (pasta, cereals, bread).

For the consumption of potatoes indicators for all districts is below the norm in 3 or more times.

Studying the dynamics of consumption of micronutrients and vitamins showed that the consumption of iron in all the districts is scarce, in total in the Republic 11.8 to 14 mg per day. For calcium in all districts consumption is also significantly lower than normal (1.200 mg), in some areas in 2 or more times. Phosphorus consumption on average in the Republic amounted to 893.9 mg per day (in the norm 1000 mg), the content of potassium - 2039.3 mg versus 3.500 mg (the norm). Magnesium intake was also below the recommended numbers (220.5 vs. 400 mg per day).

For the consumption of vitamins it is also noted a significant deficit in all major types, so the deficit on vitamin C is more than 50%.

For vitamins B1, B2, PP and retinol a significant deficit (40-50% of the recommended norm) is also noted [3, 4].

Rospotrebnadzor of the Republic Sakha (Yakutia) conducted monitoring of the nutritional status of the population, control of the conformity of the quality and food safety requirements of the legislation of the Russian Federation, the legislation of the Customs Union [2].

Proportion of samples of food raw materials and food products that do not meet hygienic standards for the analyzed indicators, in total for the whole country exceeds the national average 2.3 times, accounting for 11.5% (Russia - 4.8%), in the dynamics of 7 years reduction of proportion of non-standard samples on sanitary and chemical indices in 9 times, microbiological - at 10.8%. Increase in the proportion of food samples that do not meet the requirements for parasitological indicators (6.2%) is marked. It should be noted that in 2013 the number of samples for chemical indicators, as well as the number of non-standard, does not include research on the physical, chemical and organoleptic characteristics (Table. 1).

Over the period 2007-2013 excess of permissible levels of radioactive substances was not found, in the whole for 7 years 2447 samples were studied (2013- 454, 2012- 378, 2011- 276, 2010- 394, 2009-310, 2008 - 279, 2007-356) [2].

In 2013, there has been a significant improvement in the quality of the investigated food and food raw materials for chemical indicators compared to 2007 in all categories, exceeding the hygienic standards was met for index "nitrate" in the following product groups: "potato", "fruit and berries "(Table 2).

In order to oversee the biosafety of food raw materials and food products for microbiological indicators for the period 2007-2013 174731 samples were investigated; annually more than 20 thousand samples were investigated. In 2013 21.60 samples were studied, the proportion of samples that do not meet the hygiene requirements was 11.5%, compared with the 2007 figure was reduced by 1.4% (2012 - 11.8%; 2011- 12. 9, 2010- 12.1, 2009-13.0, 2008-12.2, 2007 - 12.9%). The share of imported products that do not meet the requirements of hygienic standards, for 7 years is leveled from 6 to 1.4% (4.2 times).

A high percentage of non-standard samples are occurring in milk, dairy products, " meat and meat products», «bird and poultry products","fish and non-fish species and products produced from them","culinary","bakery", "pastry", "flour, cereal products", "fruit and vegetables", "vegetables, dining greens ", "alcoholic beverages and beer", "mineral water", "food supplements."

It should be noted that the proportion of samples that do not meet the requirements of hygienic standards for a product group "meat and meat products" decreased by 1.5 times, "poultry and poultry products", "fish and non-fish species and the products produced from them" - 1.3 times [2].

In 2013, the number of samples tested for parasitological indices exceeds the number of samples in 2007 to 41.8% (in 2013 – 770, in 2007-543). According to studies, the proportion of samples that do not meet hygienic standards at the level of 2007: in 2013 - 1.7, in 2012 - 1.8, in 2011- 2.5, 2010- 2.3, 2009-1.4, 2008 -0.7, 2007 - 1.6%. In 2013 13 non-standard samples were found, including the following product groups: "meat and meat products" - 1 sample (1.4%), "fish and non-fish species and the products produced from them" - 3 (1.2 %), "fruit and vegetables" - 6 (1.8%), "fruit, berries" - 2 samples (2.9%).

Control over the safety of food raw materials and food products from genetically modified sources is carried out within the framework of the implementation of the Resolution of the Chief State Sanitary Doctor of the Russian Federation from December 31, 2004 N 13 "On strengthening the supervision of foods derived from genetically modified ingredients."

Since 2008, on the basis of the virology laboratory FBUZ "Center for Hygiene and Epidemiology in the Republic Sakha (Yakutia)" research on the identification of genetically modified sources have been conducted. In 2013 77 samples of meat, dairy, fruit and vegetable products, canned food, cereals were studied, the content of genetically modified sources above the permissible requirements have not been identified (in 2012 - 80 samples, in 2011 - 133 samples), the presence of GMOs in the period 2008 -2013 years was not established [2].

In 2013, on the results of surveillance activities of the Rospotrebnadzor Dpt. of the Republic Sakha (Yakutia) 911 batches of food raw materials and food of 16.648.93 kg were rejected and disposed, which exceeded almost 2 times the number of rejected batches in 2012 (in 2008 in the Republic 531 batches were rejected, with a total weight of 15.380 kg).

All in all, for the period 2008-2013 3646 batches of food were withdrawn from circulation, totally more than 100 tons (100.032.968 kg), the major parties in the categories of "meat and meat products", "poultry and poultry products", "milk and milk products", "fish and fish products" "bakery and confectionery", "soft drinks", "alcohol", "canned", "baby food."

CONCLUSION

The energy value of the diet for a 10-year period decreased to 2012 by 11% and amounted to an average of 1885.7 kcal. The greatest reduction in caloric occurred in an industrial area (1797 kcal), the lowest - in the Arctic (2020 kcal). The average daily intake of protein, fats and carbohydrates for a 10-year period did not change significantly, remaining well below the

recommended physiological norms. A significant deficit in potassium, magnesium, calcium, iron, vitamins B1, B2, C, PP, retinol remains.

According to the Rospotrebnadzor Dpt. Republic Sakha (Yakutia) it was revealed that the proportion of samples of food raw materials and food products that do not meet hygienic standards for the analyzed indicators on the whole in the Republic exceeded the national average 2.3 times, accounting 11.5% (RF - 4.8%). In the dynamics of 7 years decline in the share of non-standard samples on sanitary and chemical (9 times), microbiological (10.8%) indicators was demonstrated. Increase in the proportion of food samples that do not meet the requirements for parasitological indicators (6.2%) was marked.

Table 1

Indicators of samples of food raw materials and food products, do not comply with sanitary and epidemiological requirements

Indicators	2007		2008		2009		2010	
	samples	proportion, %	samples	proportion, %	samples	proportion, %	samples	proportion, %
Sanitary-chemical	1567	5.5	839	4.1	761	5.1	758	4.8
Parasitological	9	1.6	2	0.7	5	1.4	7	2.3
Microbiological	4884	12.9	3564	12.2	2701	13.0	2721	12.1
Indicators	2011		2012		2013		Growth rate in 2013 (to 2007), %	
	samples	proportion, %	samples	proportion, %	samples	proportion, %	In number	In proportion
Sanitary-chemical	783	5.5	551	3.9	9	0.6	-99.4	-89
Parasitological	10	2.5	12	1.8	13	1.7	+44.4	+6.25
Microbiological	2677	12.9	2766	11.8	2434	11.5	-50.1	-10.8

Table 2

Proportion of samples of food raw materials and food products that do not meet hygienic standards for sanitary-chemical indicators

Food raw materials and food products	The proportion of food samples that do not meet the requirements of hygienic standards						
	2007	2008	2009	2010	2011	2012	201
Total	5,4	4,1	5,1	4,8	5,5	3,9	0,6
imported	5,1	1,2	2,7	3,5	1,4	4,9	0
Vegetables, greens dining / fruits and vegetables	1,7	0	0	1,4	3,3	2,4	0,8
imported	0,5	0		1,3	0	2,7	0
imported	0	0		1,4	1,8	5	2,3
imported	0	0		0	0	0	0
Fruits and berries	4,0	1	1,7	3,3	4,3	0	2,5
imported	4,0	0	0,6	0	7,1	0	0

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