

EVALUATION OF THE BIOLOGICAL COMPLETENESS OF FOOD DIETS IN SPECIALIZED INSTITUTIONS OF THE MINISTRY OF INTERNAL AFFAIRS (MIA)

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Abstract The biological value of diets in specialized institutions of the Ministry of Internal Affairs was assessed. A total of 1,200 menu-layouts and the state of mg / hour excretion of ascorbic acid were studied in 197 respondents, of which 87 were on the actual background and 113 were on the changed nutritional background. Based on the correction of nutrition compared with the existing actual nutrition, the energy value of diets, the content of proteins, fats and carbohydrates are given in accordance with physiological needs. As a result, BVR (biological value of rations) increased from 57.0% to 71.0% in men and 73.0% in women. Against the changed background of nutrition, an increase in the vitamin C content in all special contingents was achieved in the winter-spring season by 25-30%, and in the summer-autumn season by 35-40%, due to an increase in the overall biological usefulness of rations.

Key words Diets of specialized institutions, biological nutrition, provision with ascorbic acid.

Introduction. Decree of the President of the Republic of Uzbekistan No. UP-5814 dated September 9, 2019 “On measures to radically improve the system of sanitary and epidemiological services of the Republic of Uzbekistan” [1] provides for the implementation of a system of national monitoring and surveillance of foodborne diseases in order to ensure early detection, assessment and elimination of risks; assistance in the implementation of food safety policies based on risk analysis and scientifically based approaches in the process of identifying, assessing and managing potential risks in the field of public health.

Under this Decree of the President of the Republic of Uzbekistan, measures are being taken to scientifically assess risk factors for the development of non-contagious diseases, which require constant monitoring of the nutritional status of the population, nutritional status, as well as the prevalence of nutritional-dependent diseases and the health status of various population groups. This task is closely related to the implementation of the system of socio-hygienic monitoring, is its mandatory component in terms of developing criteria for nutrition quality and public health, monitoring application points [1-5].

The purpose of research. The aim of the work was to assess the biological usefulness of diets in special institutions of the Ministry of Internal Affairs and the possibility of their correction.

Characterization of research objects

A simultaneous study of the quality of the actual and directionally changed nutrition of respondents in specialized institutions with the study of the excretion of ascorbic acid was carried out.

Research Methods for Actual and Directionally Modified Nutrition

The nutrition of the special contingent has been studied by two groups of methods - calculation and laboratory.

Calculation methods are used in determining the nutritional and biological value of diets. For statistical analysis, 1200 layout menus were used (360 of them on the actual background and 840 on the changed power background). The nutritional value of diets was calculated on the basis of tables of the chemical composition of food products [6].

The biological value of diets was estimated by 26 indicators, separately for the cold and warm seasons of the year. The biological value of dietary proteins was expressed in relative values (in

percent) in comparison with similar indicators of the standard, which is usually used as chicken egg proteins (FAO / WHO, 1985).

The total biological value of rations (BVR) was calculated according to the method of A.S. Khudaiberganov, R. R. Usmanhodzhaev, 1992 [7].

$$BVR = \sqrt[n]{\frac{lisin_p}{lisin_n} \times \frac{threonine_p}{threonine_n} \times \frac{tryptophan_p}{tryptophan_n} \times \dots \times \frac{C_p}{C_n} \times ect \times 100\%}$$

Where, **n** is the amount of biologically active substances in the studied diet; **p** is the daily norm of this ingredient for the subjects; **N** is the total number of selected ingredients.

The calculation of the index of essential amino acids (EAA) was performed as the geometric average of the ratios of the essential amino acids of the protein under study with their amount in the whole egg protein (in%):

$$Inde EAA = \sqrt[n]{\frac{lisine_u}{lisine_{cm}} \times \frac{threonine_u}{threonine_{cm}} \times \frac{tryptophan_u}{tryptophan_{cm}} \times \dots \times ect \times 100\%}$$

where, **n** is the number of amino acids in the studied protein; **cm** is the amino acid content in the standard; **u** is the amino acid content in the test protein.

In studies to assess the state of actual nutrition and nutrition, a special role belongs to biochemical indicators of the state of metabolism, since a quantitative assessment of the level of consumption of food substances does not reveal the completeness of their functions. According to the literature, of the total complex of biologically active substances, vitamin C has the greatest effect on the state of metabolism [8.9]. In this connection, biochemical studies of the body of the respondents with vitamin C were carried out in mg \ hour excretion in urine according to N.S. Zheleznyakova. (Spirichev V.B., 1985 [10].

The research results show that for persons sentenced to deprivation of liberty held in penal institutions, as a result of the correction, the energy value of diets for men increased from 2865.0 ± 44 Kcal to 3174.8 ± 40 Kcal and for women to 2960 ± 35 Kcal. It should be noted that gender separation is not established in existing nutritional standards. The protein content in diets increased by 25-27% (from 75.0 ± 6.0 g to 107.0 ± 5.0 g in men and 101.5 ± 5.0 g in women), the fat content increased by 10-15% (from 69.5 ± 3.2 g to 79.0 ± 4.0 g in men and 73.0 ± 4.5 g in women). As a result, BVR (biological value of diets) increased from 57.0% to 71.0% in men and 73.0% in

women. Higher BVR in women compared with men is associated with lower rates of bakery products, flour and pasta, with an identical norm for the content of vegetables, pumpkin, cape and fish. The results of the correction of the diets of people kept in forced labor colony (FLC) who work in difficult and harmful working conditions (norm No. 2) by replacing bread from a mixture of peeled rye flour and wheat grade 1 that existed in the Soviet era with bread of higher biological value i.e. from wheat flour 2 and 1 varieties, the inclusion of legumes, an increase in pasta by 20-25%. Considering the working conditions of the work of the special contingent, the meat content receiving this diet increased from 120 g to 130 g per day. Based on the principles of PPN (JIIII), 100 ml of milk per day was added to this contingent. The vegetable content was increased by 10-15%, margarine was replaced with animal fat, greens and dried fruits were included.

The analysis of the content of the main biologically active nutrients in the average daily diets of convicts, for the main nutrients on the actual and changed nutritional background, shows an increase in the content of vitamins B1, B 2, B 6, PP, A, C and such important minerals as calcium, phosphorus and gland. Against the changed background of nutrition, the ratio of Proteins: fats and carbohydrates improved from 1: 1.0: 6.6 on the actual background by 1: 0.7: 5.0 on the changed. An increase in animal proteins from 41.5 ± 1.2 g against the actual nutritional background to 45.2 ± 1.1 g against an altered background. Accordingly, the content of vitamin A increased from 610.0 ± 22 μ g / equiv to 720.0 ± 15 μ g / equiv; carotenoids from 2.0 ± 0.05 mg to 2.5 ± 0.06 mg; Vitamin C from 42.6 ± 2.0 mg to 60.0 ± 2.0 mg; Vitamin D from 1.0 ± 0.1 mg to 1.5 ± 0.3 mg; vitamin B1 from 1.0 ± 0.04 mg to 1.4 ± 0.05 mg; Vitmine B2 from 1.0 ± 0.05 mg to 1.5 ± 0.06 mg; Vitamin B6 from 1.1 ± 0.02 mg to 1.3 ± 0.03 mg; vitamin PP from 12.2 ± 0.2 mg to 15.4 ± 0.1 mg; iron from 8.0 ± 0.01 mg to 10.0 ± 0.2 mg; potassium from 1810 ± 52 mg to 2100 ± 53 gm; calcium from $610-21$ mg to 670 ± 20 mg; phosphorus from 920 ± 25 mg to 990 ± 27 mg; sitosterols from 101.0 ± 0.2 mg to 115.0 ± 0.3 mg; PUFAs (polyunsaturated fatty acids) from 1.8 ± 0.07 gr to 3.0 ± 0.06 gr; fiber from 18.0 ± 0.6 grams to 22.2 ± 0.7 grams per day.

As an analysis of the results of biochemical studies of the state of C-vitamin metabolism in the subjects receiving actual (unadjusted) nutrition shows a low level. This is evidenced by the relatively low excretion of vitamin C in the studied for all objects, which indicates the absence of sources of vitamin C. Against a changed nutrition background, a significant increase in the C-vitamin supply of the body of the studied was achieved in the form of an increase of mg / hour excretion by 18-20% in winter, spring, and 20-25% in the summer and autumn seasons, which indicates the effectiveness of nutritional corrections, due to the increase in the biological value of diets and nutritional supplements fresh greens and vegetables.

Conclusions.

1. Against a changed nutrition background, the protein content in diets increased by 25-27% (from 75.0 ± 6.0 g to 107.0 ± 5.0 g in men and 101.5 ± 5.0 g in women), the fat content increased by 10- 15% (from 69.5 ± 3.2 g to 79.0 ± 4.0 g in men and 73.0 ± 4.5 g in women). As a result, BVR (biological value of rations) increased from 57.0% to 71.0% in men and 73.0% in women.

2. An analysis of the results of biochemical studies of the state of C-vitamin metabolism in convicts and in penitentiary institutions with qualitatively different food backgrounds, after the correction, shows a significant increase in the C-vitamin supply of the body of the studied in the form of an increase of mg \ hour excretion by 18-20% in winter, spring, and 20-25% in the summer and autumn seasons, which indicates the effectiveness of the nutritional corrections in special institutions of the Ministry of Internal Affairs.

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