

Actual Set of Products Provided to Children of Preschool Educational Organizations with 4 Meals Per Day

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Abstract Dietary malnutrition of preschool children is one of the global problems. Many children have a deficiency of basic nutritional substances, as well as vitamins and minerals. The purpose of this study was to assess the actual intake and consumption of food products by preschool children. Materials and methods: The study was conducted in preschool education institutions with 9-10.5-hour stay of children and 4 meals a day, located in Tashkent city. Eighty-two menu-sheets (38 for winter-spring and 44 for summer-autumn periods of the year) designed for preschool children were studied. Foodstuffs availability in the studied preschool education institutions amounted to 79%; such foodstuffs as potato flour, fish, cheese, dried fruits and cocoa were completely absent. Depending on the season of the year, the examined children's diet was characterized by the lack of butter, sugar and potatoes (1.2 times), vegetables and milk (2 times), vegetable oil, sour cream and eggs (3 times). Low consumption of confectionery and wheat flour (5 times), cottage cheese (7 times), sausages, fruits, berries and juices (10 times) indicates their significant deficiency in the diet. The present research could be the basis for the development of adequate measures aimed at filling nutrient deficiencies and improving the diet of organized children.

Keywords Average daily intake, Actual nutrition, Ration, Set of food products, Menu-sheets, Children of preschool educational institutions

1. Introduction

In many countries, regardless of their socio-economic development, the structure of preschool children's diets is characterized by a persistent decrease in biologically nutritious foods [2,4-6,8-13,15,20]. According to the set of products, children do not get enough different types of the foods, including fish, meat and meat products, dairy and fermented milk products, eggs, vegetables and fruits, butter, and against this background receive 1.5 times more bread and bakery products, potatoes, pasta, cereals and 2-4.5 times more sweets and candies [1,3,14,16]. According to foreign scientists, the deficiency of the most important nutritional substances (complete proteins, fats and complex carbohydrates), as well as vitamins and minerals in children's diets reaches up to 50% [2,4,6,7,12,17-19,20]. The organization of nutrition is of great importance in the preschool education system of children. The nutrition regime in preschool education institutions (PEIs) depends on the number of hours of daily attendance. In Uzbekistan, there are PEIs with different lengths of stay

(3-4 hours, 9-10.5 hours, 12 and 24 hours) and different multiplicity of meals (1, 3, 4 or 5 meals a day).

In this regard, the study of nutritional adequacy of preschool children is an urgent public health problem, and the results of such studies will make it possible to develop targeted preventive measures aimed at ensuring nutritional adequacy in preschool education institutions.

Objective of the study was to assess the actual set and consumption of food products by preschool children.

2. Materials and Methods

The study was conducted at the bases of PEIs with 9-10.5-hour stay of children and 4 meals a day, located in Tashkent city. The object of the study was 82 menu-sheets (38 for winter-spring and 44 for summer-autumn periods of the year) designed for preschool children. The average daily actual consumption of products used in the preparation of meals during the week was calculated for weekdays.

We analyzed the menu-sheets based on the permission of the City Department of Public Education and the written informed voluntary consent of the heads of PEIs.

The obtained data were subjected to statistical processing using Excel-2016 program.

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3. Results and Discussion

In the diet of organized children in the winter-spring period of the year, 5 out of 24 food items (potato flour, cheese, fish, dried fruit and cocoa) were absent, i.e. the food supply was 79.2% on average.

The reduced amount of products consumed during the winter-spring period of the year, such as sugar (1.2 times or by 13.2%), potatoes (1.3 times or by 20%), milk (1.8 times or by 43.9%), vegetables (1.8 times or by 45.9%), eggs (2.2 times or by 54%), vegetable oil (2.6 times or by 62%), sour cream (2, 7 times or by 63.6%), cottage cheese (by 3.4 times or by 70.6%), wheat flour (by 3.6 times or by 72%), confectionery (by 5.2 times or by 80.7%), sausages (by 5.3 times or by 81%), fruits, berries and juices (by 11.3 times or by 91.1%), indicates their deficiency in the diet of surveyed children (table 1).

A comparison of the actual set of products provided to children of the surveyed PEIs in the winter-spring period of

the year with the recommended physiological norms shows excessive consumption of meat and poultry (by 1.2 times or by 22.5%), cereals and pasta (by 1.3 times or by 29.3%).

Assessment of actual food consumption in PEIs in the summer-autumn period of the year showed a complete absence of cottage cheese, fish, dried fruits, sausages, potato flour and cocoa in the diet (table 2).

In the summer and autumn period of the year, the diet was characterized by a shortage of sugar (1.1 times or by 11.5%), butter (1.1 times or 12.3%), potatoes (1.2 times or by 18.8%), vegetables (1.6 times or by 37.5%), milk (2 times or by 51.2%), vegetable oil (2.5 times or by 59.3%), sour cream (2.9 times or by 66%), eggs (4.2 times or by 76%), confectionery (4.5 times or by 78%), wheat flour (7.8 times or by 87.2%), fruits, berries and juices (8.3 times or by 87.9%), as well as cheese (25 times or by 96%).

At the same time, during the summer-autumn period of the year such foodstuffs as meat and poultry in the diet prevailed in excessive amounts (1.2 times or by 20.1%).

Table 1. Average daily intake and actual food consumption by children in the winter-spring period of the year, g/day

№	Foodstuffs	Physiological standard	Actual food consumption	Difference	
				g	
1	Wheat bread, 1 grade	170	157.6	-12.4	7.3
2	Wheat flour, 1 grade	25	7	-18	72.0
3	Potato flour	3	0	-3	100
4	Pasta, cereals, incl.	45	58.2	+13.2	29.3
	- mung bean	2	0.9	-1.1	45
5	Sugar	60	52.1	-7.9	13.2
6	Confectionery products	15	2.9	-12.1	80.7
7	Butter	35	32.4	-2.6	7.4
8	Vegetable oil	15	5.7	-9.3	62.0
9	Milk	600	337	-263	43.9
10	Sour cream	25	9.1	-15.9	63.6
11	Cottage cheese	50	14.7	-35.3	70.6
12	Cheese	25	0	-25	100
13	Meat and poultry	160	196	+36	22.5
14	Sausages	10	1.9	-8.1	81
15	Fish	40	0	-40	100
16	Egg	0,5	0.23	-0.27	54
17	Potatoes	250	200	-50	20
18	Various vegetables, including tomato paste	300	162	-138	45.9
19	Fruits, berries and juices	350	31	-319	91.1
20	Dried fruits	15	0	-15	100
	- rosehip	5	0	-5	100
21	Brewed tea	0,3	0.3	0	0
22	Cocoa powder	1	0	-1	100
23	Iodised salt	8	8	0	0
24	Yeast	1	1	0	0

Table 2. Average daily intake and actual consumption of products by children in the summer-autumn period of the year, g/day

№	Foodstuffs	Physiological standard	Actual food consumption	Difference	
				g	
1	Wheat bread, 1 grade	170	160.7	-9.3	5.5
2	Wheat flour, 1 grade	25	3.2	-21.8	87.2
3	Potato flour	3	0	-3	100
4	Pasta, cereals, incl.	45	45.6	+0.55	1.2
	- mung bean	2	0	-2	100
5	Sugar	60	53.1	-6.9	11.5
6	Confectionery products	15	3.3	-11.7	78
7	Butter	35	30.7	-4.3	12.3
8	Vegetable oil	15	6.1	-8.9	59.3
9	Milk	600	292.9	-307.1	51.2
10	Sour cream	25	8.5	-16.5	66
11	Cottage cheese	50	0	-50	100
12	Cheese	25	1	-24	96
13	Meat and poultry	160	192.2	+32.2	20.1
14	Sausages	10	0	-10	100
15	Fish	40	0	-40	100
16	Egg	0.5	0.12	-0.38	76
17	Potatoes	250	203.1	-46.9	18.8
18	Various vegetables, including tomato paste	300	187.5	-112.5	37.5
19	Fruits, berries and juices	350	42.4	-307.6	87.9
20	Dried fruits	15	0	-15	100
	- rosehip	5	0	-5	100
21	Brewed tea	0.3	0.3	0	0
22	Cocoa powder	1	0	-1	100
23	Iodised salt	8	8	0	0
24	Yeast	1	1	0	0

Children in PEIs consumed sugar (1.1 times or by 12.3%), potatoes (1.2 times or by 19.4%), vegetables (1.7 times or by 41.7%), milk (1.9 times or by 47.5%), eggs (2.5 times or by 60%), vegetable oil (2.5 times or by 60, 7%), sour cream (2.8 times or by 64.8%), confectionery (4.8 times or by 79.3%), wheat flour (4.9 times or by 79.6%), cottage cheese (6.8 times or by 85.2%), fruits, berries and juices (9.5 times or by 89.5%), sausages (10 times or by 90%), and cheese (50 times or by 98%) during a year.

Analysis of food items issued on average per year in PEIs shows excessive consumption of such products as meat and poultry (by 1.2 times or by 21.3%), as well as cereals and pasta (by 1.2 times or by 15.3%).

4. Conclusions

- Such food products as potato flour, fish, cheese, dried fruits and cocoa were completely absent in the diet of organized children in winter-spring and summer-autumn periods of the year out of 24 recommended items. Food availability in the studied PEIs was 79%.

- The diet of the surveyed children in different periods of the year was characterized by a lack of butter, sugar and potatoes (1.2 times), vegetables and milk (2 times), vegetable oil, sour cream and eggs (3 times). Low consumption of confectionery and wheat flour (5 times), cottage cheese (7 times), sausages, fruits, berries and juices (10 times) indicates their significant deficiency in the diet.
- In winter-spring and summer-autumn periods of the year, such foodstuffs as meat and poultry (1.2 times), cereals and pasta (1.3 times) prevailed in the diet of the surveyed PEIs in excessive quantities.

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