



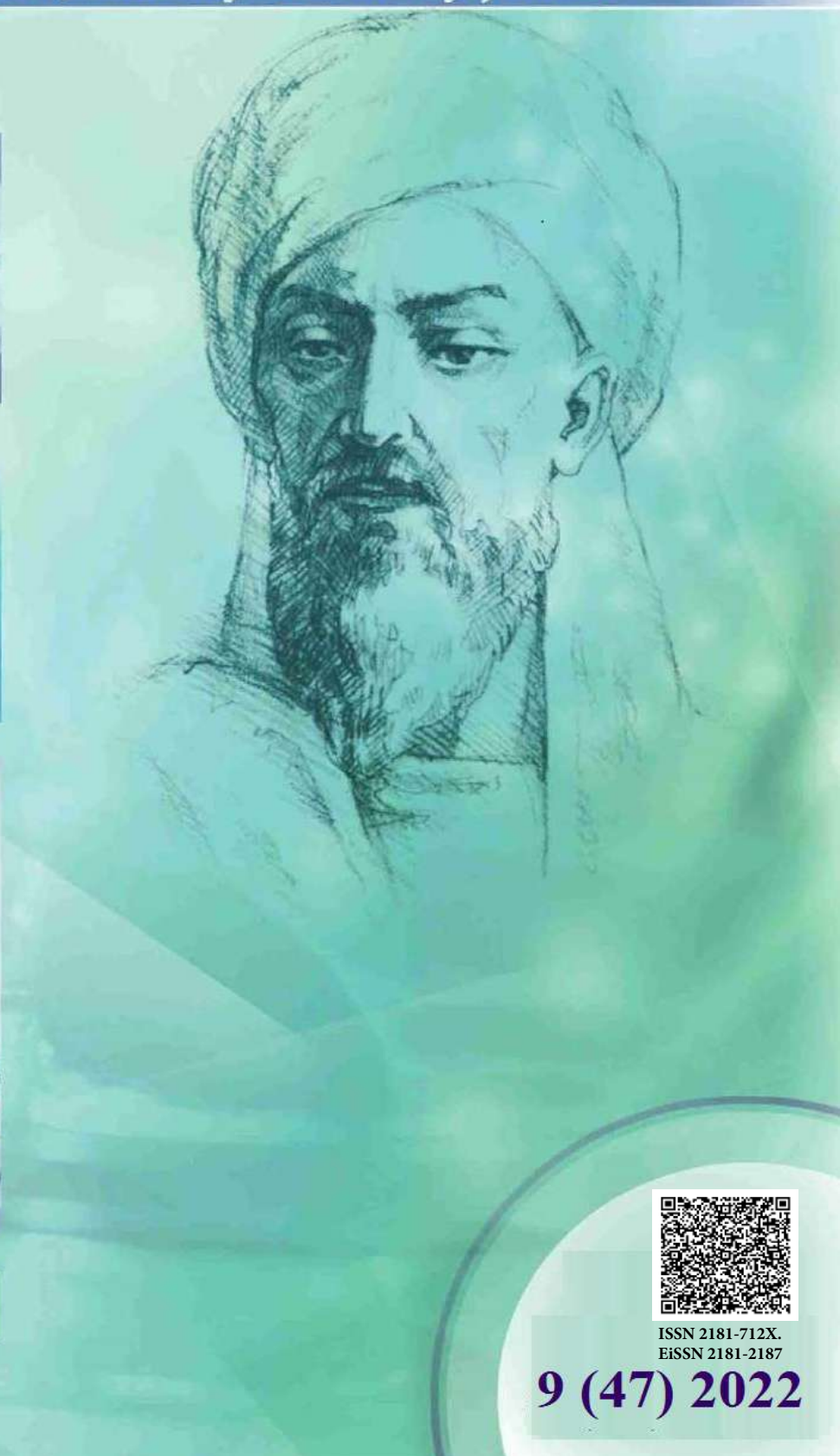
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## HYGIENIC ANALYSIS OF NUTRITION OF PATIENTS WITH COVID-19 IN HOME CONDITIONS

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### ✓ Resume

*Hygienic assessment of the daily diet in home conditions of patients with COVID-19 in the winter-spring and summer-autumn seasons of the year were taken from 938 patients diagnosed with this disease, which 375 of them are (40%) men and 563 (60%) women. The composition of the patients' diet during the day is evaluated according to the requirements of Sanitary norms and Rules 0007-2020 and their chemical composition. As can be seen from the obtained results, the analysis of the main nutrients in the diet shows that proteins are provided by 87.9%, fats by 104.9%, and carbohydrates by 112.6% in the winter-spring season, and in the same order in the summer-autumn season we can see that it was -79.15-91.63-114.6%. This is due to the excessive consumption of carbohydrates, especially in both seasons, compared to physiological norms. This has a negative impact on the population's health and ability to work.*

*Keywords. COVID-19, daily diet, diet order, food products, proteins, fats and vegetable oils, carbohydrates, vitamins and mineral elements.*

## ГИГИЕНИЧЕСКИЙ АНАЛИЗ ПИТАНИЯ БОЛЬНЫХ COVID-19 В ДОМАШНИХ УСЛОВИЯХ

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### ✓ Резюме

*Гигиеническая оценка суточного рациона в домашних условиях больных COVID-19 в зимне-весенний и летне-осенний периоды года проведена у 938 больных с диагнозом данное заболевание, из них 375 (40%) мужчин и 563 (60%) женщины. Состав рациона больных в течение суток оценивают по требованиям СанПиН 0007-2020 и их химическому составу. Как видно из полученных результатов, анализ основных питательных веществ в рационе показывает, что в зимне-весенний период года белки обеспечены на 87,9 %, жиры на 104,9 %, углеводы на 112,6 %, и в таком же порядке в в летне-осенний период мы видим, что она была -79,15-91,63-114,6%. Это связано с избыточным потреблением углеводов, особенно в оба сезона, по сравнению с физиологическими нормами. Это отрицательно сказывается на здоровье и трудоспособности населения.*

*Ключевые слова. COVID-19, суточный рацион, режим питания, продукты питания, белки, жиры и растительные масла, углеводы, витамины и минеральные элементы.*

## UY SHARTLARIDA KOVID-19 BO'LGAN BEMORLARNING OZIQLANISHINI GIGIENIK TAHLILI

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### ✓ *Rezyume*

*Yilning qish-bahor va yoz-kuz fasllarida COVID-19 bilan kasallangan bemorlarning uy sharoitida kunlik ovqatlanishini gigienik baholash ushbu kasallik bilan kasallangan 938 nafar bemordan olindi, ulardan 375 nafari (40 foizi) erkaklar va 563 nafari. (60%) ayollar. Bemorlarning kun davomida ovqatlanish tarkibi 0007-2020 sanitariya normalari va qoidalari va ularning kimyoviy tarkibi talablariga muvofiq baholanadi. Olingan natijalardan ko'rinib turibdiki, oziq-ovqat ratsionidagi asosiy oziq moddalar tahlili qish-bahor mavsumida oqsillar 87,9%, yog'lar 104,9%, uglevodlar 112,6% ga, shu tartibda bo'lishini ko'rsatadi. yoz-kuz mavsumida -79,15-91,63-114,6% ekanligini ko'rishimiz mumkin. Bu, ayniqsa, har ikki faslda, fiziologik me'yorlarga nisbatan uglevodlarni ortiqcha iste'mol qilish bilan bog'liq. Bu esa aholi salomatligi va mehnat qobiliyatiga salbiy ta'sir ko'rsatmoqda.*

*Kalit so'zlar. COVID-19, kundalik ovqatlanish, parhez tartibi, oziq-ovqat mahsulotlari, oqsillar, yog'lar va o'simlik moylari, uglevodlar, vitaminlar va mineral elementlar.*

### Relevance

**The urgency of the problem.** Nutrition is an important determinant of immune status, with inadequate nutrition being the most common cause of immune deficiency worldwide [5].

Disorders of cellular immunity, phagocyte function, complement systems, cytokine production, and immunoglobulin A secretion are generally associated with protein-energy deficiency [6,7,8].

Individual vitamins, including vitamins A, V6, B12, C, D, E, and micronutrients including folate and zinc, iron, selenium, magnesium, and copper, play an important and complementary role in supporting both the innate and adaptive immune systems. Deficiency or suboptimal status of micronutrients negatively affects immune functions and may reduce resistance to infections [3,4]. Other nutrients such as omega-3 fatty acids also support the efficient functioning of the immune system, including anti-inflammatory effects [3,6]. The ongoing scientific research allows to reduce the number of diseases related to healthy eating among the population and to develop preventive measures and analyze them from a hygienic point of view.

**The purpose of the study.** The purpose is hygienic analysis of the eating habits of different age groups of the population during the current pandemic.

**Research materials and methods.** In the study, the content of nutrients consumed daily in home conditions of the Zangiota District Hospital No. 1 and No. 2 of COVID-19 of the 938 patients, which of them 375 (40%) are male and 563 (60%) are female, were analyzed and hygienically evaluated during the winter-spring and summer-autumn seasons. The main food products in the diet of patients during the day was according to Sanitary norms and Rules 0007-2020 "Average daily rational nutrition norms aimed at ensuring healthy nutrition for the population of the Republic of Uzbekistan by age, gender and professional activity groups" sanitary standards and requirements were implemented according to the amount of the chemical composition of the daily diet [1,2].

Statistical processing of the research results was done using the "Statistica for Windows 7.0" personal computer application package.

### Discussion of the obtained results

The results of the study show that the majority of patients eat differently, that is, irregularly during the day. 25-30% of them do not have breakfast in the morning. 35-40% eat hard-to-digest foods for dinner. These conditions do not comply with hygienic requirements and have a negative effect on the functioning of the gastrointestinal system and the decrease in the daily high performance of the population.

The level of consumption of food products consumed by patients in the winter-spring season is presented in Table 1.

There are specific changes in the diet of the population in the winter-spring season; bread made from high-quality flour, rice and pasta products are very unnecessary.

The level of bread consumption in the diet is in excess for 170.4% in men and 161.3% in women.

In the winter season, the amount of pickled cabbage, cucumber, tomato increased by 140.6% in men and 137.2% in women compared to the physiological norm.

**Table 1**

**Quantitative level of daily food products consumed by patients with COVID-19 at home during the winter-spring season**

No	Product	Physiological norm		Absolute consumption rate		%		Lower compared to the norm	
		Male	Woman	Male	Woman	Male	Woman	Male	Woman
1	Flour	20	20	31±1.3	29±1.4	155	145	11	9
2	Rice	50	45	24±2.2	18±2.1	48	40	-26	-27
3	Porridges	20	20	7±0.3	6±0.2	35	30	-13	-14
4	Bread	250	220	426±13.3	355±11.5	170.4	161.3	176	135
5	Pasta	50	40	60±5.3	35±5.2	120	87.5	10	-5
6	Potatoes	220	200	236±31.1	218±31.2	107.3	109	16	18
7	Pickled cabbage	50	50	70.3±5.7	80.5±5.8	140.6	137.2	13	7
8	Cucumber, tomato	100	100	40±3.2	30±3.1	40	30	-70	-70
9	Beets and carrots	80	80	56±4.4	43±4.3	70	53.75	-24	-37
10	Another vegetable	60	60	73±6.9	67±6.3	121.7	111.7	13	7
11	Poly crops	50	50	32±3.1	23±2.2	64	46	-18	-27
12	Pumpkin	30	30	30±1.2	25±1.3	100.0	83.3	0	-5
13	Fruits	250	250	78±4.4	76±4.2	31.2	30.4	-172	-174
14	Dry fruits	20	20	10±1.3	5±1.4	50.0	25.0	-10	-15
15	Grapes	30	30	24±2.1	17±2.2	80	56.7	-6	-13
16	Citrus fruits	15	15	10±0.6	12±0.7	66.7	80	-5	-3
17	Beef	60	60	45±4.1	36±3.3	75	60	-15	-24
18	Mutton	30	20	12±1.4	10±1.1	40	50	-18	-10
19	Internal products	8	5	4±0.2	5±0.3	50	100.0	-4	0
20	Chicken	70	60	55±3.3	37±2.1	78.6	61.7	-15	-23
21	Sausage	25	15	28±2.1	19±1.1	112	126.7	3	4
22	Fish	35	35	21±2.3	12±1.3	60	34.3	-14	-23
23	Salted fish	8	3	15±1.2	2±0.1	187.5	66.7	7	-1
24	Canned fish	22	22	10±0.1	5±0.2	45.5	22.7	-12	-17
25	Milk	400	400	74±4.1	76±4.3	18.5	19	-326	-324
26	Sour cream, cream	15	15	10±1.2	7±0.7	66.7	46.7	-5	-8
27	Animal fat	30	25	22±1.3	16±1.4	73.3	64	-8	-9
28	Other dairy products	25	20	10±1.2	9±0.9	40	45	-15	-11
29	Cheese	20	20	5±0.5	3±0.3	25.0	15.0	-15	-17
30	Egg	1	1	1	0.5±0.03	100.0	50.0	0	-0.5
31	Sugar	30	20	53±3.1	48±3.2	176.7	240	23	28
32	Margarine	5	5	15±1.2	20±1.4	300.0	400.0	10	15
33	Vegetable oil	30	25	30±3.2	26±2.2	100	104	0	1
34	Green Mung beans	6	6	5±0.1	3±0.1	83.3	50.0	-1	-3
35	Beans	6	6	8±0.3	4±0.2	133.7	66.7	2	-2
36	Peas	8	8	15±0.4	10±0.3	187.5	125	7	2
37	Salt	5	5	20±1.4	15±1.2	400.0	300.0	15	10
38	Confectionery	40	40	50±3.1	55±3.2	125	137.5	10	15

Pure cucumber and tomato products are reduced by 70-60%.

It should be noted that insufficient consumption of greens and vegetables in the winter season caused a partially increase of diseases.

As can be seen from the data presented in Table 2, the summer-autumn season of the year shows that the home eating habits of the examined patients are completely derailed.

At home, flour consumption was 135% for men, 90% for women, while bread was 165.2 and 166.8% in the same order, porridge was consumed 68%-73.3% less.

Meat products in general (beef, lamb, offal, chicken and sausage) are 42% less for men and 50% less for women.

**Table 2**

**Quantitative level of daily food products consumed by patients with COVID-19 at home during the summer-autumn season**

No	Product	Physiological norm		Absolute consumption rate		%		Low relative to the norm	
		Male	Woman	Male	Woman	Male	Woman	Male	Woman
1	Flour	20	20	27±0.1	18±0.1	135	90	7	-2
2	Rice	50	45	16±0.01	12±0.2	32	26.67	-34	-33
3	Porridges	20	20	5±0.1	4±0.1	25.0	20.0	-15	-16
4	Bread	250	220	413±13.1	367±11.2	165.2	166.8	163	147
5	Pasta	50	40	54±5.6	42±5.3	108	105	4	2
6	Potatoes	220	200	170±30.2	146±31.1	77.3	73	-50	-54
7	Cabbage	50	50	60±5.6	54±6.4	120	108	10	4
8	Cucumber, tomato	100	100	68±7.1	53±4.2	68	53	-32	-47
9	Beets and carrots	80	80	54±5.3	40±3.2	67.5	50	-26	-40
10	Another vegetable	60	60	44±22.4	50±2.2	73.3	83.3	-16	-10
11	Poly crops	50	50	32±3.5	28±2.4	64	56	-18	-22
12	Pumpkin	30	30	15	10	0	0	-30	-30
13	Fruits	250	250	84±4.3	80±4.2	33.6	32	-166	-170
14	Dry fruits	20	20	5±0.2	5±0.3	25.0	25.0	-15	-15
15	Grapes	30	30	10±0.9	10±0.9	33.3	33.3	-20	-20
16	Citrus fruits	15	15	6±0.2	8±0.2	40	53.3	-9	-7
17	Beef	60	60	36±3.1	29±2.2	60	48.3	-24	-31
18	Mutton	30	20	20±1.1	15±1.2	66.7	75	-10	-5
19	Internal products	8	5	4±0.3	3±0.2	50	60	-4	-2
20	Chicken	70	60	35±3.3	20±3.1	50	50	-35	-30
21	Sausage	25	15	17±0.9	13±0.7	68	86.7	-8	-2
22	Fish	35	35	10±0.3	10±0.2	28.6	28.6	-25	-25
23	Salted fish	8	3	6±0.5	3±0.5	75	100.0	-2	0
24	Canned fish	22	22	5±0.5	5±0.5	22.7	22.7	-17	-17
25	Milk	400	400	86±3.1	102±3.1	21.5	25.5	-334	-330
26	Sour ream,cream	15	15	10±3.1	7±2.1	66.7	46.7	-5	-8
27	Animal fat	30	25	18±1.1	14±1.2	60	56	-12	-11
28	Other dairy products	25	20	20±1.1	15±1.1	80.0	75.0	-5	-5
29	Cheese	20	20	5±0.3	3±0.1	25.0	15.0	-15	-17
30	Egg	1	1	1	0.5	100.0	50.0	0	-0.5
31	Sugar	30	20	40±1.1	35±1.2	133.3	175.0	10	15
32	Margarine	5	5	15±2.1	18±3.2	300.0	360.0	10	13
33	Vegetable oil	30	25	25±2.1	15±2.2	83.3	60.0	-5	-10
34	Green Mung beans	6	6	3±0.1	2±0.2	50.0	33.3	-3	-4
35	Beans	6	6	3±0.1	3±0.1	50.0	50.0	-3	-3
36	Peas	8	8	10±0.05	6±0.05	125.0	75	2	-2
37	Salt	5	5	11±0.2	9±0.2	220	180	6	4
38	Confectionery	40	40	41±2.1	48±2.2	102.5	120	1	8



In general, fish products (fish, salted fish, canned products) are were 30.76% in men and 30% in women.

The amount of milk was 21.5% in men and 25.5% in women, which is very low, and at the same time, the lack of protein, vitamins and minerals in milk is one of the main factors related to the spread of COVID-19.

In our national customs, the majority of the population does not eat fish, the amount of vitamin D and selenium in fish is important in COVID-19. Consumption of fish and fish products is less for 67.7% in men and 70% in women.

The main food ration contains more salt, sugar, confectionery products, bread products, for example, salt is 220-180%, sugar is 133.5-175%, confectionery is 102.5-120% excess than they should.

Fruits are mainly pears and black plums are rich in cellulose, which improves digestion. Improves bowel function, greatly contributes to the removal of slag and toxins from the body, in addition, these fruits protect body cells from harmful radicals, store a lot of vitamin C, which prevents the development of inflammatory processes. However, these products provide 33.6-32% of the daily diet.

With antibacterial and antiviral properties, garlic is a unique product that contains a large amount of substances that help in detoxification. Its consumption is 20-5% per day usually, which leads to a decrease in immunity.

It should be noted that the patient's diet at home does not meet hygienic requirements, the amount of meat, milk, butter, eggs, fruits and vegetables in the summer-autumn season of the year is less than the physiological norm.

The analysis of the main nutrients in men shows that in the winter-spring season proteins provided by 87.9%, fats by 104.9%, and we can see that in summer-autumn season analogically it was 79,15-91,63-114,6%. This resulted in an excess of carbohydrates, especially in both seasons, in comparison to the physiological parameters (listed in the Table 3).

**Table 3**

**Quantitative daily nutrient levels at home in male patients with COVID-19**

No	Indicators	Standard, g	Men, seasons of the year			
			Winter-spring	%	Summer-autumn	%
1	Proteins, g	118	103.7±18.6	87.9	93.4±15.2	79.15
2	Fats, g	119.5	125.3±17.4	104.9	109.5±14.1	91.63
3	Carbohydrates, g	561.2	631.9±25.1	112.6	643.2±25.4	114.6
4	Power value	3104.4	3512.9±167.2	113.2	3292.6±161.4	106.06
5	P:F:C ratio	1:1:3	1:1,2:4,5		1:1,17:4,9	

The analysis of the main nutrients of the women in home conditions shows that in the winter-spring season, proteins are provided by 69.01%, fat content by 93.58%, and carbohydrates by 121.7%, while in the summer-autumn seasons by 88.16-103.9-108 % analogically (see –Table 4).

**Table 4**

**Quantitative daily nutrient levels at home in female patients with COVID-19**

No	Indicators	Standard, g	Women, seasons			
			Winter-spring	%	Summer-autumn	%
1	Proteins, g	108.1	74.6±15.2	69.01	95.3±15.2	88.16
2	Fats, g	104.4	97.7±17.3	93.58	108.5±14.1	103.9
3	Carbohydrates, g	444.1	540.5±21.3	121.7	479.2±25.4	108
4	Power value	2764.7	3011.2±144.1	108.92	3246.4±159.7	117.4
5	P:F:C ratio	1:0.96:4.1	1:1,3:6		1: 1.14: 4.86	

The consumption ratio of the main nutrients in the home food of patient, in contrast to the physiological normative ratios specified in sanitary standards and regulations No. 0007-20 is in the following ratio: in men 1:1,2:4,5 in the winter-spring season and 1:1.17:4.9 ratio in summer-autumn season; for women by 1:1, 3:6 in winter-spring and in 1:1.14:4.86 summer-autumn seasons.

### Conclusions

1. The composition of the daily diet of patients at home does not meet hygienic requirements, that is, the amount of flour, bread and pasta from bread and bakery products are overconsumed by 178.3% and 154.3% in men, 149.6% and 152.5% in women in the winter-spring and summer-autumn seasons compared to established physiological norms.

2. The consumption level of meat products in the diet is insufficient in all seasons, and in general (beef, sheep, offal, chicken and sausages) it is less consumed for 42% in men in the winter-spring season, 43.5% for the summer-autumn season, and 50-56.8% less for women.

3. It is a pity that the level of consumption of dairy products by the population is much lower than the established physiological norm, as it can be seen from the ration analysis that the consumption of dairy products in winter-spring was 24.1% less in men and 22.8% less in women, and in summer-autumn season it was 26.3-27.5%. As it can be seen, it was found that the nutritional content that provides the body through dairy products is insufficient.

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