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Nutrition of older adults in the Republic of Kazakhstan

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ABSTRACT

This article discusses a study on the nutrition specifics of older adults living in social service institutions in three major cities of the Republic of Kazakhstan: Nur-Sultan, Almaty, and Shymkent. The direction of the research meets the priorities of the World Health Organization to achieve goals on aging and health. The diets of older adults in the Republic of Kazakhstan were studied, food preferences were identified, and needs for basic nutrients were established. This article presents the results of sociological surveys of older adults who answered questions about nutrition, preferred foods, raw materials, and meat products. Based on the survey results, technologies of herodietic meat products aimed at enriching the diet with proteins were developed, along with practical recommendations for a balanced diet. This area of research is relevant due to the lack of products with a herodietic profile on the Kazakhstan market.

Keywords: balanced nutrition, older person, questionnaire, aging, herodietic product

INTRODUCTION

The development of the food industry in Kazakhstan is a strategic task designed to provide high-quality and diverse food products in response to the country's growing population and the significant increase in food consumption [1, 2]. Research on the health and longevity of modern man has shown that 10% depend on health care, 20% on genetics, 20% on ecology and the state of the environment, and 60% on lifestyle [3], [4]. The life expectancy of citizens in the Republic of Kazakhstan has increased by almost five years over ten years (from 68.41 years in 2010 to 73.15 years in 2018). However, in some Organization for Economic Cooperation and Development countries (Chile, Turkey, and others) with the same level of GDP as in Kazakhstan, the indicator is about 80 years. The first task of the State Program for the Development of Healthcare of the Republic of Kazakhstan for 2020 – 2025 is to form a commitment to a healthy lifestyle among the population [5]. One of the main reasons that a person does not reach the upper age limit of life lies in premature aging due to a violation of an optimal lifestyle and, to a large extent, nutritional characteristics. A balanced diet influences the nature of metabolism and the state of human organs and systems, allowing for activity, and reduce correcting its homeostasis, maintaining activity and reducing aging [6], [7], [8], [9]. The median forecast of the total population of Kazakhstan predicts almost 19 million at the end of 2020, more than 21 million in 2030, more than 23 million in 2040, and 25.5 million in 2050.

According to the probabilistic forecast of the sex and age structure of the population of Kazakhstan until 2050, the upper limit for expected life expectancy is 93 years for women and 85 years for men [10]. An aging population is inevitable, so governments must adopt and implement relevant policies regarding health, employment, social protection, housing, food security, migration, poverty reduction, and others [11]. There is no consensus on the sharp increase in life expectancy. This phenomenon is associated with evolutionary development, improved housing conditions, sufficient food and medical care, and many other factors [12]. With age, there is a weakening of the two components of taste – the sense of smell and taste receptors. These changes interact with each other to reduce the pleasure of eating. A slight increase in the threshold values of taste, which occurs with age, suggests a need for richer tasting food for elderly patients. Many complaints about food quality can be explained by changes in the pleasure of eating as age increases. Elderly patients are particularly susceptible to malnutrition if they suffer from a chronic mental or physical illness. In cases of significant malnutrition, there is clear evidence of the benefits

of nutritional support, showing that good nutrition and even the use of vitamin and mineral supplements can play an important preventive role in maintaining the health and quality of life among the elderly [12], [13], [14]. Slowing metabolism, lack of appetite, undesirable side effects from taking numerous medications, a tendency to overeat, a high risk of food poisoning, and atherosclerotic changes are the main problems that every older adult will inevitably face. Changes should be made to the usual diet to reduce the negative consequences.

According to statistics, about 75% of elderly people have some kind of nutritional disorder: about 20% overeat, and 60% eat irrationally (more often men), which is expressed in the predominance of meat and flour products with a high content of animal fat, sweets, muffins and insufficient consumption of dairy products, fish, vegetables, and fruits [15]. This is a special social group of the population in need of state social protection. There is no unified law on the rights and freedoms of the elderly in Kazakhstan that would regulate the issues of social protection of the aging population, including taking into account access to quality food. With age, certain needs appear that also require attention from the state. Kazakhstan has several regulatory legal acts regulating certain types of legal relations involving the elderly, for example, the Law of the Republic of Kazakhstan On Pension Provision and the Law of the Republic of Kazakhstan On benefits and social protection of participants, invalids of the Great Patriotic War and persons equated to them. However, not all the needs and problems of the elderly are taken into account in these documents.

Following the UN General Assembly initiative of December 14, 1990, the International Day of the Elderly is celebrated in Kazakhstan on October 1. A large-scale social protection system for the elderly has been established. Older adults have various benefits and guarantees, and pensions are regularly increased.

The concept of “quality longevity” plays a unique role and significance in developing an anti-aging model to increase the expected duration of quality life. The model’s effectiveness should be determined using assessing the quality of life and forming the scientific foundations of this problem. One of these directions is “assimilation - health improvement through the principles of proper nutrition (health improvement aimed at forming the principles of rational and balanced nutrition)” [16]. The demographic situation in Kazakhstan is characterized by a steadily increasing proportion of people over 60 years old, which corresponds to the global aging process of the population. Significant changes are taking place in the public consciousness, and the value orientations, functions, and roles of the elderly in modern society are also changing. International documents point to the awareness of the value of elderly persons, their contribution to the development and functioning of social systems, and the possibility of active participation in society’s economic and cultural life. At the same time, it is important to move from simple awareness to building a flexible gerontosocial policy at the national level [17].

The solution for issues related to the aging of the population requires an integrated approach. Therefore, it occupies a worthy place among the directions of state policy.

Qualitative growth of human potential, including older people as one of the fastest-growing groups in Kazakhstan, is an important factor in our country’s sustainable economic and social development [18], [19]. To maintain health, efficiency, and longevity, it is necessary to observe the basic principles of rational nutrition: energy balance and regular satisfaction of the human body’s need for macro- and micronutrients [20].

Kazakhstan is at an early stage of joining the category of countries with a predominantly elderly population. The solution for issues related to the aging of the population requires an integrated approach. This is impossible without developing a unified concept of state policy concerning the elderly. Its strategic goal should be to increase the level and quality of life of older people based on social solidarity, forming a new attitude to the place of old age in the life cycle.

In addition to the general age-related changes, the functional state of each person’s organs and systems has unique characteristics. The needs of people for absorption largely depend on the flowing state of health [21]. Scientists have shown that the elderly population is the largest demographic group with a disproportionate risk of inadequate nutrition and malnutrition. Aging is associated with a decrease in many physiological functions that can affect the state of nutrition. The muscle mass of the body decreases, the metabolic rate decreases, the gastric secretion of digestive juices decreases, changes occur in the oral cavity, and the sensory functions of the gastrointestinal tract are disrupted. The nutritional status of the elderly is an important factor in determining the quality of life, morbidity, and mortality [22], [23], [24], [25], [26]. One of the important goals of the World Assembly on Ageing, adopted in Madrid in 2002, is to promote adequate nutrition throughout life for all older people, preferably based on the consumption of local foods, and in particular by defining national nutrition goals [27]. Scientists involved in herodietics believe that a healthy diet and lifestyle can help prevent disease, especially chronic disease. Given the high growth rates of the elderly and senile population around the world, scientists and manufacturers began addressing the problem of maintaining the health status of this population group by changing the nature of its nutrition [28-40].

The results of innovative research within the framework of the cooperation of the European Regional Office of the World Health Organization in 2016 – 2017 demonstrate that to ensure sustainable development, the

popularization of healthy nutrition should become one of the priority areas of work in Kazakhstan. Measures should be developed in effective cooperation with healthcare, agriculture, education, mass media, and culture [31].

Thus, the essence of herodietics is that food should satisfy the body's needs in energy and food substances and contribute to the prevention of the development of chronic non-communicable diseases of modern man, the preservation of health and longevity, and the prevention of premature aging.

The development of formulations that meet the requirements for herodietic products involves using various animal and plant origin components. Animal proteins contained in meat and fish are complete in amino acid composition, vegetable oils and animal fats are sources of polyunsaturated fatty acids, and vegetable raw materials are sources of vitamins and of macro- and microelements, therefore specialized products are always multicomponent [33]. The concept of the state policy in the field of healthy nutrition for the population of the Republic of Kazakhstan should rationalize the population's nutrition through the extensive development and introduction of specialized food products enriched with biologically active components. One of the most effective ways to implement this approach is the production and consumption of a new food category – fortified products, which are traditionally consumed products with added essential nutrients and minor components of food. According to the FAO/WHO Food Code, food fortification is defined as adding one or more nutrients to food products to prevent or correct the existing deficiency of one or more nutrients in the population or in a separate group [34]. There is not enough information about the development and creation of products for herodietic nutrition in the Republic of Kazakhstan. The domestic food industry does not in practice produce special food products intended for the elderly and older adults. Modern food production technologies do not consider the specifics of nutrition of older age groups. However, the experience of specialists in medicine, dietetics, and gerontology testifies to the need to introduce the technology for the production of herodietic products in our country as a factor in the prevention of pathological conditions with regular physiological aging [35].

Scientific Hypothesis

Based on the study results, food technologies will be developed that take into account the preferences of older adults, which will greatly improve the quality of life.

MATERIALS AND METHODOLOGY

Samples

Our sample consisted of respondents living in nursing homes in three major cities in Kazakhstan: Almaty City Veterans Home (Almaty), the municipal state institution Sharapat Social Service Center (Nur-Sultan), and the state institution Shymkent Boarding House for the Elderly and Disabled of Turkestan region (Shymkent). These institutions are designed to accommodate people who have reached retirement age and disabled people of groups I and II, lonely and requiring constant outside care. In total, 1,000 residents live in these institutions: 400 elderly people in Nur-Sultan, 400 in Almaty, and 200 in Shymkent. The structure of the respondents was as follows:

- Total number of respondents: 500
- Men: 46.4%
- Women: 53.6%

Age categories:

- 60 – 74: 52.4%
- 75 – 80: 23%
- 81 – 90: 22.8%
- 90 and above: 1.8%

Education:

- Basic (primary school): 23.4%
- Secondary (high school): 47%
- Higher education (university): 29.6%

Description of the Experiment

Questionnaire preparation: The authors developed a questionnaire to enable them to study the main health problems of older people in Kazakhstan and understand their food preferences. The questionnaire consists of 12 multiple-choice questions (Table 1) that ask about gender, age, health status, preferences for various foods, knowledge about herodietic products, and factors of human life expectancy. The survey passed a preliminary test before distribution. All questions were mandatory.

Survey: The survey period was from June 2018 to January 2019. It was conducted in Almaty in June 2018, in Nur-Sultan in September 2018, and in Shymkent in January 2019. Official permission to conduct the survey was

obtained from the institutions' administration, and the ethical aspects were agreed upon, including the consent of the participants, voluntary participation, and confidentiality. Respondents had the option to answer the questionnaire in written or oral form.

Number of answers:

The total number of processed answers was 500.

Creation of the dataset:

We processed the raw data. Each verbal answer was examined. Offensive and vulgar responses were deleted. We performed grammatical correction of text answers and prepared the final dataset for further processing in Microsoft Excel (Office 365). The structure of the dataset was adapted to further statistical processing.

Processing of the responses:

We evaluated all questions and visualized the consumers' opinions by figures. We evaluated the individual text answers and formulated the most frequent opinions of the participants. These answers are presented in the discussion section of this article.

Statistical Analysis

Multiple correspondence analysis was used to visualize the data obtained from the questionnaire survey. Statistical significance was determined based on the significance of the p -value. The statistical program R studio (vs. 1.3.959) was used for data processing. Multiple correspondence analysis (MCA) is an extension of simple correspondence analysis to summarize and visualize a data table containing more than two categorical variables. It can also be understood as a generalization of the main components' analysis when the analyzed variables are qualitative instead of quantitative [36].

RESULTS AND DISCUSSION

The survey was conducted from June 2018 to January 2019 in Almaty (June 2018), Nur-Sultan (September 2018), and Shymkent (January 2019). The official permission of the administration of the institutions to conduct the survey was obtained, and the ethical aspects were agreed upon, including the consent of the participants, voluntary participation, and confidentiality. Respondents had the opportunity to answer the questionnaire in written or oral form. Respondents noted that the questions were clear and accessible (Table 1).

When developing the research methodology, it was planned to interview 1,000 respondents. Ultimately, 500 respondents were interviewed: 200 in Nur-Sultan, 200 in Almaty, and 100 in Shymkent, which is 50 percent of the residents of each institution.

Table 1 Survey Results of Elderly People Living in Veterans Homes.

No	Questions	Location of the survey (cities)			Total, people
		Nur-Sultan	Almaty	Shymkent	
1	2	3	4	5	6
	Number of respondents	200	200	100	500
1	Your gender?				
	Male	96	98	38	232
	Female	104	102	62	268
2	Your age?				
	60–74	110	94	58	262
	75–80	24	76	15	115
	81–90	66	26	22	114
	over 90	0	4	5	9
3	What diseases have you been diagnosed with?				
	high blood sugar	26	30	11	67
	obesity/overweight	14	6	6	26
	anemia	18	16	0	34
	diseases of the digestive system	36	32	22	90
	high blood pressure	50	44	30	124
	diseases of the musculoskeletal system	42	40	22	104
	high cholesterol	14	12	9	35
	no health complaints		20		20
4	Do you know what herodietic nutrition is?				
	I know	2	0	2	4
	I do not know	198	200	98	496
5	What, in your opinion, affects a person's life expectancy?				
	heredity	22	18	6	46
	accessibility of healthcare	30	24	8	62
	ecology	32	42	36	110
	proper nutrition	68	70	32	170
	physical activity and active mental activity	48	46	18	112
6	Do you prefer milk and dairy products?				
	yes	138	100	64	302
	no	28	88	29	145
	I find it difficult to answer	34	12	7	53
7	Do you prefer vegetable dishes and fruits?				
	yes	74	95	41	210
	no	82	55	39	176
	I find it difficult to answer	44	50	20	114
8	Do you have a need for fish and fish products?				
	yes	88	116	46	250
	no	112	84	54	250
	I find it difficult to answer				
9	Do you prefer dishes made from cereals and legumes?				
	yes	80	74	69	223
	no	80	82	26	188
	I find it difficult to answer	40	44	5	89

Table 1 Cont.

No	Questions	Location of the survey (cities)			Total, people
		Nur-Sultan	Almaty	Shymkent	
1	2	3	4	5	6
	beef	24	62	15	101
	lamb	46	30	24	100
	horse	50	62	25	137
	pork	32	6	2	40
	poultry	42	36	30	108
	camel meat	6	4	4	14
11	What meat products do you prefer?				
	sausages	72	106	29	207
	pates	38	32	14	84
	jelly	46	38	36	120
	cutlets	44	24	21	89
12	What kind of dishes do you prefer according to the type of heat treatment?				
	boiled	66	100	86	252
	fried	72	68	14	154
	pickled/smoked	62	32	0	94

Note: The distribution of respondents by age categories achieved as a result of the survey is shown in Figure 1. Older adults of different ages took part in the survey: 53.6% of the survey participants were women, and 46.4% were men.

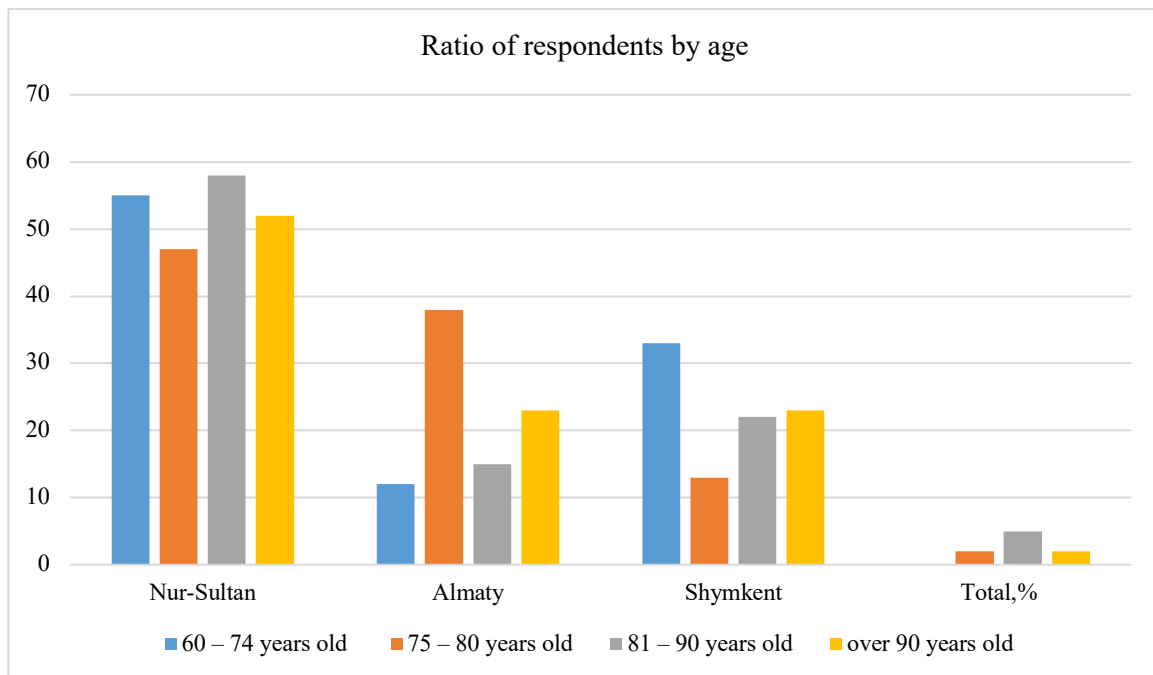


Figure 1 Distribution of Respondents by Age Categories shows that about half of the respondents (52%) are between 60 and 74 years old, 23% of elderly people are aged 75 to 80 years, 23% of respondents are aged 81 to 90 years, and centenarians make up 2%. Note: The survey results on the diseases of older adults living in veterans' homes are shown in Figure 2.

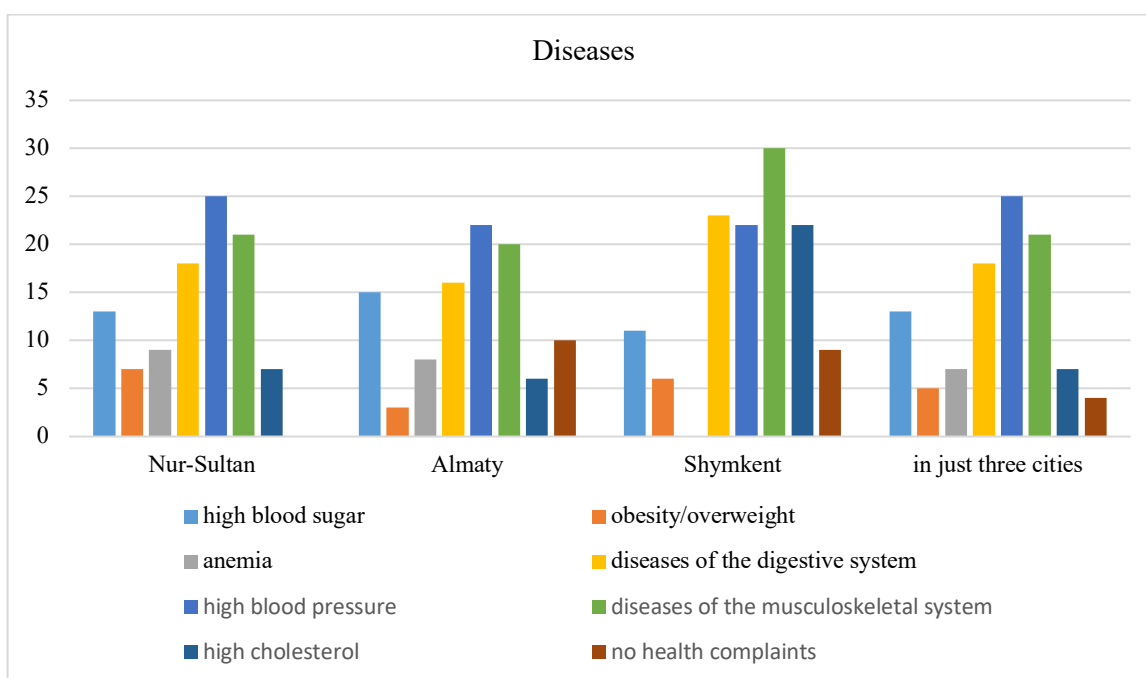


Figure 2 Number of Diseases Noted by Respondents.

The study showed that high blood pressure (25%), diseases of the musculoskeletal system (21%), and diseases of the digestive system (18%) are common among respondents, followed by elevated blood sugar (13%), high blood cholesterol (7%), anemia (6%), and obesity/overweight (5%). Four respondents had no health complaints. It is important to note that most of these diseases can be treated with dietary adjustments.

In general, respondents avoid assessments of their health and instead consider it satisfactory. It is important to note that most of these diseases can result from insufficient and improper nutrition.

It should also be noted that 99% of the survey participants do not know about herodietic products (gerontological nutrition). This shows that there is insufficient information about nutrition and products intended for the elderly category in Kazakhstan. It was revealed that older adults are not aware of the connection between diseases and nutrition.

The respondents also answered questions about factors affecting longevity, as shown in Table 2.

Table 2 Respondents’ Opinions on Factors Affecting Human Life Expectancy (survey results).

Factors affecting human life expectancy	Nur-Sultan	Almaty	Shymkent	All three cities combined
	Factors affecting life expectancy (%)			
Heredity	11	9	6	9
Accessibility of healthcare	15	12	8	12
Ecology	16	21	36	22
Proper nutrition	34	35	32	34
Physical activity and active mental activity	24	23	18	22

Among the list of factors affecting human life expectancy, respondents identified proper nutrition (34%), physical activity and active mental activity (22%), and ecology (22%).

A very important factor affecting health and life expectancy is nutrition. The preferences of elderly and senile people regarding food, in general, are presented in Table 3.

Table 3 Preferences of Elderly People Regarding Food (survey results).

Participant responses	Milk and dairy products	Vegetable dishes and fruits	Fish and fish products	Dishes from cereals and legumes
Factors affecting life expectancy (%)				
Yes	60	42	50	45
No	29	35	50	38
I find it difficult to answer	11	23	-	17

Most respondents in the survey on food preferences prefer milk and dairy products (60%). With age, however, a person’s ability to digest lactose decreases. Not all elderly people tolerate milk well, experiencing discomfort in increased gas formation, abdominal pain, and loose stools.

Table 3 shows that respondents prefer vegetable dishes and fruits (42%), fish and fish products (50%), and cereals and legumes (45%).

One of the objectives of this study is to investigate respondents’ preferences for types of meat for the development of herodietic meat products since meat is a source of protein.

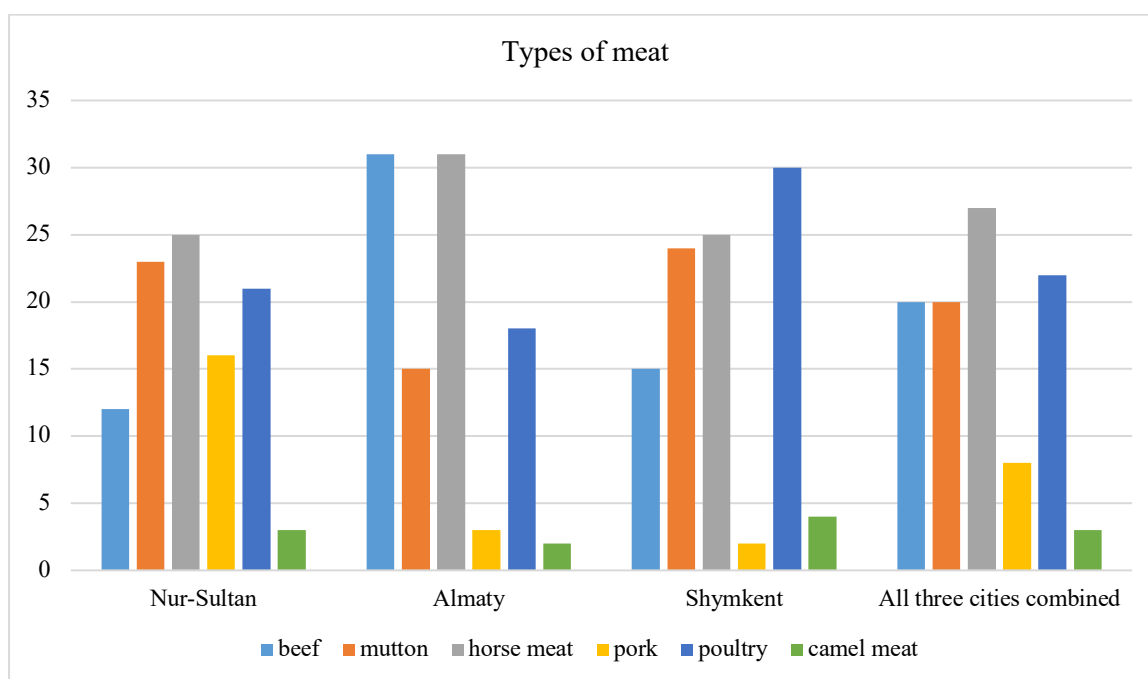


Figure 3 Distribution of Preferences for Types of Meat Products.

The survey revealed that respondents from Nur-Sultan prefer horse meat the most (25%), respondents from Almaty prefer horse meat and beef equally (31%), and respondents from Shymkent prefer poultry (23%) (Fig. 3). The difference between official statistics and the survey results is due to the cost of meat.

In general, Kazakhstanis prefer horse meat (27%), while poultry is in second place (22%), followed by beef and mutton (20% each). The survey participants from Nur-Sultan and Shymkent would like to have more fish and fish products in their diet.

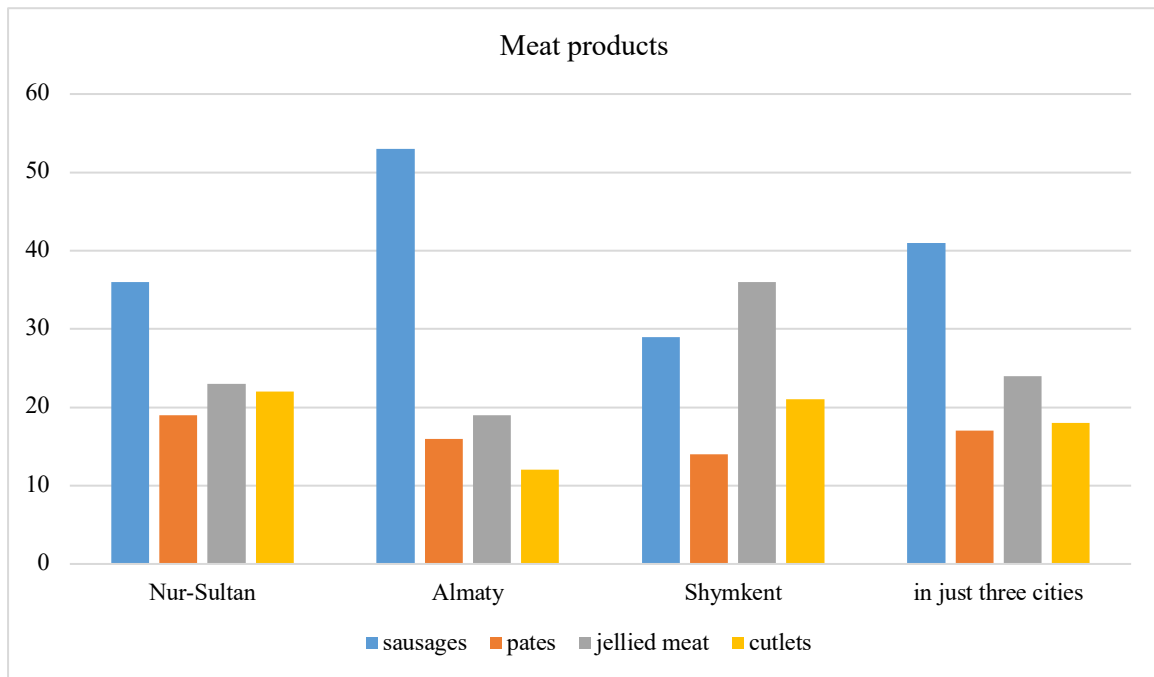


Figure 4 Distribution of Respondents' Preferences for Meat Products.

The survey results from Fig. 4 show that older people prefer sausage products (41%), jellied meat (24%), cutlets (18%), and pates (17%) to meat products.

As for the methods of heat treatment of food, 50% of the survey participants prefer boiled or steamed food, 31% prefer fried food, and 19% prefer pickled and smoked food.

Gruver et al., who has been studying the aging process in Okinawa for several years, believe that life expectancy is determined by five factors: proper nutrition, lack of stress, a caring environment, a high level of physical activity, and spiritual mood. The Japanese island of Okinawa holds the world record for the number of centenarians. Men live for an average of 88 years, and women for 92 years, which is 10 to 15 years longer than in the rest of Japan [41]. Swedish scientists Kumar and Manish emphasize that the main negative consequence of aging is immunogenicity, which can be defined as a decrease in the immune system's functionality, which can cause changes in the structure and composition of the intestinal microflora in the elderly. Dieting and the use of probiotics and prebiotics can help prevent and treat age-related physical conditions, support the beneficial intestinal microflora, and thus promote healthy aging [42]. The aging process includes changes in a person's physiological, pathological, social, and psychological conditions. Nutrition is an important element of the health of the elderly, and it affects the entire aging process [43]. In old age, proper nutrition is necessary to maintain a normal state and efficiency of the body. Proper nutrition throughout life is the key to healthy aging and longevity [44]. Demographic aging impacts labor and financial markets, demand for goods and services such as housing, transport, social protection, and the family structure and relationships between people belonging to different generations, significant additional requirements for health and financial services [45]. Scientists have shown that the elderly population is the largest demographic group with a disproportionate risk of inadequate nutrition and malnutrition. Aging is associated with a decrease in several physiological functions that can affect the state of nutrition. This results in a declining basic metabolic rate and decreased gastric secretion of digestive juices, disorders of the sensory function of the gastrointestinal tract, and chronic diseases. The nutritional status of the elderly is an important determining factor in the quality of life, morbidity, and mortality [22], [46]. The recommended dietary allowance (RDA) in foreign countries for protein is 0.8 g of protein/kg of body weight per day for adults, regardless of age. This is the minimum amount of protein needed to prevent the gradual loss of muscle mass. Studies have shown that protein intake greater than the RDA helps improve muscle mass, strength, and function in the elderly and improves immune status, wound healing, and blood pressure [47]. Fats are part of a healthy diet. They are the most energy-intensive nutrient stored in the adipose tissue of the body in the form of triglycerides, a source of essential fatty acids that are not produced in the human body [48]. Italian researchers believe that more than half of the elderly suffer from obesity and, at the same time, loss of muscle mass due to an unbalanced diet rich in carbohydrates and lipids but poor in valuable proteins and amino acids [49]. American researchers recommend protein supplements for elderly people with sarcopenia, which affects about 45% of men and about 26% of women [50]. The nutrition of elderly people is greatly influenced by their socio-psychological and material conditions, which can lead to malnutrition or the consumption of cheap, low-quality products. There

is a shortage of biologically active substances with aging, and those with low incomes cannot afford sufficient amounts of these substances [51]. The English scientist Leaker connects the problem of longer wound healing times in the elderly with malnutrition [52]. Australian researchers K. Schouten, M.A. Lindeman, and J. Reid speak about the need to develop and introduce a national program on gerontological nutrition, highlighting, among other problems of the elderly indigenous population of Australia, an increased percentage of people with obesity and malnutrition. According to the results of studies by Brazilian scientists on the nutrition of the elderly in the city of Sao Paulo, 33% of people in this category eat inadequately for their needs, and 60% need to alter their diet [53]. Various tools have been developed and recognized to assess the nutritional status of older people. The most widely used universal screening tool for malnutrition in the UK is the Malnutrition Universal Screening Tool (MUST), a five-step screening tool to identify elderly people who are malnourished or at risk of malnutrition [54]. Many scientists have proven the health impact of altering the nutrition of older people. Japanese scientists found improved well-being in elderly people who expanded the range of their diets and increased the frequency of their meals [55]. A study by Australian scientists identified the effectiveness of natural antioxidants in product composition concerning increasing the immunity of older people [56]. Scientists from the United Arab Emirates conducted experiments proving a reduction in depressive symptoms in the elderly while ensuring their needs for minerals and vitamins by 100% [57]. American scientists used the amino acid β -alanine as a biologically active food supplement, which positively affected the performance of elderly people [58]. Studies by Canadian scientists provide data on taurine and L-carnitine in the composition of the NOS Energy Drink and their effect on weight normalization and improvement of cognitive abilities in older people [59]. To enrich sausage products of herodietic purpose with calcium, scientists conducted research using various types of mineral raw materials: mussel shells, quail egg shells, bone marrow, alginic acid salt, bone paste [60]. Living alone and its substantial impact, along with the associated social isolation and loneliness, were highlighted in many of the discussions. Given the possible implications for nutritional intake, further work is recommended in this area. Likewise, steps should be taken to improve food access, increase opportunities for commensal eating, and, fundamentally, address social isolation and loneliness in the older population [61].

After the survey, a lecture on the unique characteristics of nutrition in older adults was organized and held in each institution, who became interested in this topic, asked questions, and actively participated in the discussion.

Respondents, psychologists, methodologists, and the administration expressed their gratitude for the interest in the health of older people and are open to cooperation with scientists in the field of lectures and seminars, the development and randomization of herodietic products. Thus, the survey revealed that the majority of respondents showed an interest in herodietic products intended for the nutrition of the elderly. The data reflect the well-being of older adults in veterans' homes relatively well and a need for products for this age group. The strengths of this study are the large sample sizes and different regions of Kazakhstan. However, the authors acknowledge that the results are based on only one group of elderly people – residents of nursing homes – and the results may differ for elderly people who live alone or with a family. A disadvantage of the survey is that the quality of the information received depends on respondents' perception of the questions and their accuracy and attentiveness. It is necessary to consider such features when a person cannot or does not want to answer the questions. In general, the questionnaire is not intended to clarify the underlying causes of any phenomenon. The obtained data fix the phenomenological side of socio-political processes and need further conceptual interpretation and theoretical explanation.

CONCLUSION

The survey results serve as material for developing practical recommendations for the preservation and promotion of health through nutrition, particularly the development of herodietic meat products. Thus, the questionnaire method studied the structure of nutrition and food preferences of older adults living in social security institutions in the Republic of Kazakhstan. It was found that most respondents prefer sausage products (41%), It was found that most respondents prefer sausage products (41%) to meat products (insert %). In comparison, 42% prefer vegetable dishes and fruits, 50% prefer fish and fish products, and 45% prefer dishes made with cereals and legumes. With regard to the choice of meat products, Kazakhstanis prefer horse meat (27%), followed by poultry (22%) and by beef and lamb (20% each). It was found that 99% of the survey participants have no idea about herodietic products and the existing connection between diseases and nutrition.

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