How did COVID-19 impact on food security of Kazakhstan?

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ABSTRACT

We live in a world of abundant resources, but we also realize that nearly one billion people worldwide suffer from chronic hunger. Food security remains an elusive objective throughout many developing countries. Each state's economic policy framework places a premium on solving the issue of food security. This issue threatens not just socio-economic stability, but also societal peace on the political and ethnic fronts. Moreover, it is recently affected by a worldwide pandemic. The focus of this study is to shed light on the subject of whether or not Kazakhstan's food security was negatively impacted by the crisis related to the COVID-19 coronavirus pandemic. Each of the four aspects of food security as availability (is there enough food stock for everyone), access (can citizens have the food they need?), utilization (can people get enough food to meet their nutritional requirements?), and stability (is there always a way for individuals to have something to eat?)—has been impacted by the world pandemic. An overall analysis reveals that Kazakhstan was able to enhance its performance throughout the COVID period, demonstrating the efficiency of government initiatives to expand agricultural production by preventing food shortages and improving food security.

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LIST OF ABBREVIATIONS

ADB – The Asian Development Bank

BNS – Bureau of National Statistics

CIS – Commonwealth of Independent States

COVID-19 – Coronavirus disease

CAGR – Cumulative Average Growth Rate

FAO – Food and Agriculture Organization

F.A.O.U. – Food and Agriculture Organization of the United Nations, & Nations

GFSI – Global Food Security Index

SSFP – Socially Significant Food Products

UN – The United Nations

INTRODUCTION

Who made the decision on what you have consumed today? The majority of adults would answer that they made their own decision. Admittedly, modern consumerism has given us a plethora of delicious alternatives; our food choices often reflect our own values and preferences. However, as reported by the United Nations World Food Programme (2022), 13 percent of the world's population, or about 800 million people, literally do not have enough to eat. Unfortunately, not everyone has the luxury of having a choice or even having something to eat at all. As a result, governments in many poor countries subsidize the consumption of a restricted number of products imported or supplied by the state, such as sugar, oil, and bread. Food security is one of the most challenging topics globally and ensuring the world's food supply is a rapidly growing field in the study of food security.

Concerns about food security developed quite clearly in the years following World War II (1939-1945), and some scholars refer to Malthus' study (1798) as the start of studies on population food security. Fortunately, even if the Malthusian theory did not accurately predict the level of hunger in the 21st century, there are still nations struggling with hunger. After the famine of the 1970s, the idea of "food security" emerged as a priority issue for nations throughout the world. Nowadays, food security is a broad phenomenon that can be achieved at the household, individual, regional, national, and global levels when all people have physical and economic access to adequate, safe, and nutritious food consumption requirements, and the foods people choose to eat, so that they may lead an active and healthy lifestyle at all times. (Food and Agriculture Organization 1996.)

Taking into account the importance of food security throughout the world at all times, especially following the recent unexpected COVID-19 outbreak, the proposed study question is how COVID-19 impacted the food security of Kazakhstan. The purpose of the current paper is to reveal to what extent Kazakhstan was ready to face unexpected issues with food security considering the lockdowns and movement restrictions. As will be discussed further, Kazakhstan has become the state with the most significant positive dynamics in terms of improving its relative position in the Global Food Security Index 2020, according to the Economist Intelligence Unit.

The Republic of Kazakhstan places a high value on ensuring its citizens have access to nutritious food since doing so is crucial to the country's long-term stability, economic growth, and state-building. It is explicitly stated in the Law of the Republic of Kazakhstan dated January 6, 2012 "On the National Security of the Republic of Kazakhstan" that food security is a prerequisite for national security. (Adilet, 2005.)

In order to present a more complete view, the methodological outline of this study will use a comparative approach. This study is best suited to this framework since we evaluate Kazakhstan's food security relative to CIS countries and over three time periods: 2019, pre-COVID-19, 2020, and 2021 during COVID-19. In order to assess Kazakhstan's food security and compare it to that of other nations and through time, researchers will utilize the Global Food Security Index. Due to time constraints and restrictions/availability of data for other countries, the authors will additionally use a mechanism of their own to access the degree of self-sufficiency in basic products and the change in the price of these items between 2019 and 2021 exclusively in Kazakhstan. The methodology section will provide context for the rest of the paper by providing a thorough and comprehensive account of how the data was collected and analyzed. Furthermore, this study will conduct a Google survey form by surveying individuals from different regions of Kazakhstan to learn more about the effects of COVID-19 on their food security. In particular, the price change along with the quality and quantity of food they could afford during COVID-19.

As for the literature synopsis, while all of the publications examined in this study agree that agricultural potential is important considering factors like food quantity and quality, it is important to remember that not all of these adjustments are applicable when dealing with unexpected situations such as the current COVID outbreak. It has become clearer that safe access to food is essential as the COVID-19 epidemic disrupted supply chains and took lives throughout the world.

The structure of this research proposal will be as follows: the second chapter will provide a review of the literature. It focuses on the impact of COVID-19 on food security in Kazakhstan and reviews the relevant research on the topic with various policies and international practices. The third chapter discusses the validity of the approach chosen for the potential study. The fourth chapter examines the anticipated outcomes of the proposed research. This study proposal's results are presented in the last chapter with a conclusion.

LITERATURE REVIEW

This literature review focuses on the experience and best practices of Kazakhstan and other countries in the implementation of effective measures on the food security affected by the COVID-19 pandemic. The paper concentrates primarily on the question of how the crisis associated with the COVID-19 coronavirus pandemic has impacted food security in Kazakhstan. Although it is too soon to assess COVID-19's long-term impact on food security, several studies have already shown that Kazakhstan is not facing a significant hunger crisis.

Definition of Food Security:

The phrase "food security" has just recently surfaced in the scientific literature and is considered a novel economic category. In English, the term "food security" has two meanings: food safety and food sustainability. In the 1948 Declaration of Human Rights, the United Nations (UN) first recognized food as a universal human right, and this paved the way for concepts such as food security and public food security (United Nations General Assembly, 2022). The term "food security" was not established until international development efforts defined it as "the capacity to fulfill aggregate food demands" in the 1960s. As a result, global food security has become an instrument of expressing and measuring the UN mandate to safeguard human rights to food and support global trade. The Food and Agriculture Organization (FAO) stated in 2009 that "food security exists when all people have physical, social, and economic access to adequate, secure, and nutritious food to fulfill dietary needs and food preferences for an active and healthy life." (Food and Agriculture Organization of the United Nations, & Nations, F.A.O.U., 2022).

Various Perspectives on Food Security:

Some scholars have sought to define and reinterpret the term "food security." Here are a few examples. Stukach, V. F., Baidalinova, A. S. &. Suleimanov, R. E. (2022) consider food security as the degree to which residents of the state are provided with environmentally friendly, healthful food products produced by their own manufacturer while adhering to science-based norms; such food must be supplied at reasonable costs. V.G. Loginov adds state-and-society roles and crises to the idea of food security. According to the scholar, the term "food security" refers to the government's and society's unfettered ability to provide its citizens with quality food in amounts both enough for

normal circumstances and minimum enough to sustain a person's health and functioning capability during times of disaster. (Loginov, 2002.) According to Antamoshkina (2013), when a country's economy and agriculture are in a condition of food security, the needs of the people for food items are met in a sustainable manner consistent with cultural norms and dietary preferences, despite the impact of several internal and external factors. Safin (2013) defines it as a set of socioeconomic interactions that emerge when it comes to meeting people's basic needs in terms of food distribution, both in quality and quantity, based on the inventive construction of agricultural reproduction and maintaining the agricultural sector's economic stability. Sultanbekova (2001) views state food security as the consistent provision of quality food to citizens, primarily to the detriment of domestic food production at a level necessary to ensure citizens' continued health and well-being (Sultanbekova et al., 2001.)

Agricultural Sector and Kazakhstan's Food Security Status:

The current research paper agrees with the authors' viewpoints that the growth of the agricultural sector is the most important aspect in guaranteeing food security because domestic food production and the satisfaction of domestic demand are dependent on a country's agricultural potential. The research by Bulkhairova et al. (2019) shows that over the examined time period, Kazakhstan's food security improved to a level on par with the rest of the globe. Nevertheless, there are significant issues that continue to hinder progress. The authors of this study surveyed a representative sample of Kazakhs via questionnaire in order to: (1) learn more about the factors that influence individuals' decisions to buy locally produced versus imported food products; (2) evaluate the affordability of food in the context of rising costs and declining purchasing power; and (3) determine whether, in the wake of the economic crisis of 2015-2016, the vast majority of Kazakhs have resorted to cultivating their own private subsistence plots or have begun stockpiling food. During the outbreak, KZ made immediate steps to improve food security and assist the agri-food sector. The government, in particular, has used state food stockpiles, decreased food costs due to export limitations, and reduced tariffs on imported food products. In addition, the budget for social programs for disadvantaged populations has been raised. According to the Eurasian Wheat Belt and Food Security (2017), in terms of global agricultural markets, and the wheat market, in particular, the Eurasian area is a major participant. Because of its substantial land resources in comparison to its people,

the CIS has a strong tendency to contribute to regional and global food security. The three most important CIS countries are Kazakhstan, Russia, and Ukraine. Only three countries account for more than 90 percent of the CIS's agricultural and arable land, 85 percent of the CIS's wheat output, 90 percent of the CIS's wheat land, and more than 95 percent of the CIS's wheat exports. As described by M. Dyussenov and N. Nurmukhametov (2020), by comparison to other emerging countries and previous stages of post-Soviet growth in Kazakhstan, food security in Kazakhstan has improved significantly. Food security, in particular, is one of the most pressing issues on the governance agenda, as shown by the legislative framework and policy analyses. The COVID-19 epidemic, the developing crisis in Ukraine, the ongoing drought in the European Union and China, and other global and regional events are anticipated to exert more pressure on food security trends. According to research conducted by Svanidze, Miranda, and co-authors (2019), all of the wheat consumed in Central Asia is imported from Kazakhstan, whereas the majority of the wheat consumed in South Caucasian nations comes from Russia, Kazakhstan, and to a smaller degree, Ukraine. Because of significant crop deficits and excessive price volatility, many nations in the Black Sea area that export wheat have instituted export control regimes in recent years. Wheat imports from Russia, Ukraine, and Kazakhstan to nations in Central Asia and the South Caucasus were replaced by imports from farther afield, such as Iran and European countries, due to export limitations. Titova and Arynova et al. (2018), livestock production is one of the most crucial subsectors of Kazakhstan's agro-industrial complex. Historically entrenched national features and traditions of nomadic existence are largely responsible for this. When it comes to fundamental nourishment, the bulk of the population of a nation relies on livestock and dairy products, and this is exactly what the country's dairy and meat processing company aims to supply. Kazakhstan's meat and milk manufacturing sectors have been dominated by hundreds of small and medium-sized firms, one in every region. Most of them are affected by the scarcity of raw resources. There are initiatives taken by the government and businesses to address this issue.

International Practices on State Regulation of Agro-industrial Complex:

Measures to regulate the agro-industrial complex indirectly by the state, as proposed by Tireuov, Mizanbekova, Kalykova, and Nurmanbekova (2018), encompass a range of strategies. These include price intervention in the food market to promote domestic

agricultural product prices, the imposition of quotas and tariffs, and the imposition of taxes on food exports and imports. Additionally, the government compensates agricultural producers for the acquisition of production means such as fertilizers, insecticides, and forages through subsidies. It also assists the business by paying loan interest, providing property insurance payments, and supporting market development through public money granted for market-based programs, as well as subsidies for storage and transportation operations. Furthermore, there is an emphasis on the development of industrial infrastructure, involving public funds for activities ensuring production efficiency, such as subsidies for the construction of production facilities, irrigation projects, and land reclamation, as well as assistance in the formation of farmer associations, are examples of such initiatives.

In countries with advanced market economies, the state actively intervenes in price formation and regulation by setting upper and lower price limits and the indicative or conditional price it supports; acquiring or disposing of non-perishable products for the purpose of commodity intervention; and maintaining the desired price level. To measure governmental management of agriculture in developed countries, financial backing for farm costs for manufactured goods is crucial. This statistic calculates the ratio of price and non-price fiscal subsidies for the cultivation, manufacturing, and sale (including export) of a certain agricultural commodity to its farm price. The analysis demonstrated that national subsidies follow a pan-European subsidy program. Additional aid, such as pricing interventions, production volume regulation, or excessive export compensation, that create favorable conditions within a country is forbidden. National governments can also support and implement initiatives to improve the quality of products, ensure veterinary monitoring, introduce scientific and technological advancements, safeguard the environment, promote production in problem areas, and ensure a minimum income for smallholders. Budget assistance may be provided by EU member states, their autonomous organizations (autonomous districts of Italy, departments and districts of France), and federal states (German territories) with budgets. It was decided that subsidies for investments should not exceed a certain level. Although EU national agrarian policies follow the Uniform Agricultural Policy, they range in direction and financing. Beyond the EU, Denmark devotes one-third of its agricultural budget to production and market development, Britain 15%, and Ireland 20%. The majority of countries spend half their agricultural budgets on structural policy, consisting of farm renovation and consolidation,

land and resource enhancement, farmer operations, production cost reduction, and development of unfavorable areas. These expenditure areas differ significantly. The United Kingdom devotes around one-third of its agricultural budget to modernization, while the Netherlands and Luxembourg devote less than 10%. In France, 25% of agrarian expenditures go to start-up farmers, whereas in Britain and Ireland, this is negligible. EU budget initiatives for "Research and development" average 10%, and the Netherlands over 30%. The EU, US, Canada, Japan, and India are making significant investments in grain farming technologies. That saves 52.7% of EU crop losses and 44% in the US. The above shows that most developed countries prioritize state oversight of the agro-industrial complex through full support of agricultural producers. Various economic levers (budget payments, production cost compensation, price support, subsidies for enhancing production framework, program formulation, and implementation) are used to establish suitable circumstances for long-term agro-industrial unit operation and rural social and production infrastructure.

Countries	**Direct state subsidies**			**Indirect state regulation**				**Other**	
	Income Support (the support of farmers' incomes)	**Natural Disaster** (payments for damage from natural disasters)	**Reorganization** (payments for damage associated with the reorganization of production (payments for reducing the acreage, forced slaughter of cattle, etc.).	**Price Intervention** (boosting domestic agriculture prices, setting quotas, tariffs, and food export/import levies)	**Production Costs** (Subsidies for fertilizers, insecticides, forages, loan interest, and property insurance help agricultural farmers buy	**Market & Transport** (product storage and transport subsidies)	**Industrial Infrastructure** (subsidies for production facilities, irrigation, land reclamation, and farmers' groups)	**Quality & Environment**	**Innovation & Technology**

					means of production)				
United States	+	+	+	+	+	+	+	+	+
United Kingdo	+	+	+	+	+	+	+	+	+
Netherlands	+	+	+	+	+	+	+	+	+
Denmark	+	+	+	+	+	+	+	+	+
Iceland	+	+	+	+	+	+	+	+	+
Canada	+	+	+	+	+	+	+	+	+
Japan	+	+	+	+	+	+	+	+	+
India	+	+	+	+	+	+	+	+	+

Government Response to Price Volatility:

The International Monetary Fund (IMF) Working Paper on Policy Responses to High Energy and Food Prices, prepared by Amaglobeli, D., Gu M., Hanedar E., Hong G., Thévenot C. (2023), underscores the complexities faced by governments in adjusting domestic food prices in the face of international price fluctuations. Even when faced with considerable fiscal costs, governments with existing subsidies may choose a delayed pace of adjustment in domestic prices due to political economics and social policy factors. However, the paper suggests that such governments should not entirely avoid retail price increases but should instead limit them. They can also use this opportunity to educate the public on the expensive distortive and unsustainable nature of uniform pricing subsidies, as well as make clear strategies to phase them away over time. In circumstances when budgetary space is limited, the disparity between domestic and foreign prices is significant, and the capacity to implement measures to alleviate the impact on vulnerable households is strong, the pace of subsidy reduction should be accelerated.

The IMF Working Paper also highlights the impact of export limitations, particularly when enforced by large exporters. Such restrictions hamper international trade while contributing to higher global pricing. While export limits may temporarily improve local supply and prevent domestic price increases, they can also inhibit domestic production

and have negative spillover effects on other countries, resulting in retaliatory actions by trading partners. Food export bans, especially by countries with a major portion of the global food market can have serious negative consequences for other countries, notably those with limited resources and high food insecurity susceptibility. Such bans can trigger a chain reaction of retaliatory measures, further constraining global supply. Historical instances of food price peaks, such as those in 1973 and 2008, suggest that trade barriers are futile at stabilizing local costs but contribute to increasing global prices. Export constraints may also damage governments adopting restrictions in the long run by diminishing incentives for manufacturing and promoting smuggling to countries with more affordable prices.

Current Research Gap:

The current literature review analyzed studies by Yeszhanova, Yermekbayeva, Myrzayeva on the evaluation of Kazakhstan's food security during times of crisis COVID-19 (2021). The authors looked into changes through time in factors such as the cost and availability of food across the nation, the reliability and safety of food supply, and the long-term viability of these factors. The authors then compared these values to the average for these parameters across 113 countries for the years 2019 and 2020. However, the research contains old data as of 2020 during the ongoing pandemic crisis. The current research paper will address the gap between the years 2020-2022 and will evaluate the range of these changes from 2019 until 2022, which will provide up-to-date information following the recovery/post-COVID period among CIS countries.

The current paper also covered the Economist magazine, which has established a food security index, the analytical application of which would make possible the incorporation of a validated evidence basis into the development of food security ideas at the regional and national levels. The findings contain more information on Kazakhstan. The results and findings indicate that Kazakhstan does not face any issues on food security and that hunger is not relevant for Kazakhstan. Accordingly, COVID-19 did not impact Kazakhstan’s performance on food security considering the period from 2019-2022. Moreover, according to the findings, Kazakhstan even improved its performance despite the COVID-19 outbreak.

According to the Asian Development Bank's (ADB) brief report, fruit and vegetable delivery was interrupted in Central Asian countries where 70%-80% of intra-regional trade is performed by road. Food supplies in food-importing states have also been affected by export limits. As Kazakhstan implemented export limits on wheat as one of the government's preventive measures, some neighboring countries like Uzbekistan saw a major decrease in flour and grain imports. Imports of rice, soybeans, and sunflower seeds have also been hampered as the Eurasian Economic Union imposed export limits on a variety of goods (Kim, 2020).

Despite satisfactory performance on food security during the COVID-19 crisis, Kazakhstan is enhancing the ways to secure the food supply in the long run. The Plan for guaranteeing food security in the medium term was discussed at a meeting of the Government headed by Prime Minister of the Republic of Kazakhstan Alikhan Smailov in 2022 (A Plan to Ensure Food Security for the Medium Term Has Been Considered in Kazakhstan – E. Karashukeev., 2022). The plan is divided into three components that call for the execution of 31 actions, including 18 steps to provide physical accessibility, 6 measures to maintain economic security, and 7 measures to assure product safety and quality. These are such activities as forecasting prices for food products; reducing rents at trade markets for implementers of socially important food products, and developing measures for the transition from administrative price regulation to targeted support for those who are more at risk due to their vulnerable socioeconomic standing; assessing the effectiveness of stabilization funds; expanding rural job opportunities by creating at least 25 thousand farms through new forms of involving agricultural land in circulation; the establishment of new irrigated farmland. The implementation of the Plan will ensure food security as an essential aspect of national security, increase the level of food security, reduce household spending on food products, and provide consumers with safe products.

Conclusion of the Literature Review:

In conclusion, the literature review shows that COVID-19's impact on food security had slightly mild effects as increasing prices of certain products and affecting certain vulnerable groups. Moreover, Kazakhstan has improved its performance during the period of crisis climbing up in the position of global index. In a search of academic literature, the current paper mainly reviewed the overview of food security in Kazakhstan in conditions of the crisis COVID-19 by Zh. Zh. Yeszhanova, D. D. Yermekbayeva, U.

A. Myrzayeva. However, their research focused on a short period from 2019-2020 and it did not reflect the price increase and did not evaluate the impact of the crisis on a vulnerable group of people. Therefore, this paper will analyze the gap of 2021, and especially during the recovery post-COVID period.

RESEARCH METHODOLOGY

Empirical setting

Agriculture is an important sector to ensure the food security. Being an agrarian country, Kazakhstan is able to satisfy its local demand in food and export some part of it. Agro-food complex includes production and processing of agricultural goods, and the distribution network that delivers the final products to households.

Since the start of the quarantine, there haven't been any significant disruptions in the food supply in Kazakhstan. In addition, some delays were simply related to the circumstances at the state borders, where control was tightened as a result of the epidemiological crisis.

In spite of the epidemic, the state still supports agriculture. The state is a major contributor to the sector's business assistance. Food security of Kazakhstan is assured by the ongoing expansion of businesses engaged in agriculture and agricultural processing.

Tools and Approaches

The research question of this study is “How did COVID-19 impact the food security of Kazakhstan?” Many countries experienced shortages in food because of transportation issues, export bans from producer countries, restricted functioning business, and other reasons. From economic stand point, shortage in goods causes prices to grow. According to UN, food price has increased by 30% globally. Since Kazakhstan participates in world trade and imports some foods, we have a hypothesis that probably will answer our research question - COVID-19 impacted the food security of Kazakhstan.

In order to better understand how COVID-19 impacted on food security of Kazakhstan, we will use a comparative design for our study. The comparative design uses comparison. In other words, comparison to different cases and situations makes the social phenomena more understandable (Bryman, 2012). Both quantitative and qualitative research can make use of the comparison design. It is important to remember that comparative research

is not just about comparing different countries. Numerous issues may be addressed using comparison-based reasoning.

This design best fits our research since we compare Kazakhstan to other countries in terms of food security, and compare the standing of Kazakhstan in three years - 2019 (before COVID-19) and 2020-2021 (during COVID-19).

In conducting this research, the authors will examine food security of Kazakhstan from global and local perspective. Researchers will use the Global Food Security Index as a multidimensional tool to measure food security of Kazakhstan and compare it in a period of time and to other countries. The authors will also employ a tool of their own - accessing the level of self-sufficiency in basic goods and their price change between 2019 and 2021 only in Kazakhstan due to time limit and restrictions/availability of data for other countries.

Food self-sufficiency measures how local production can satisfy its needs (Food and Agriculture Organization of the United Nations & Nations, 2022). Regarding price change in basic goods in Kazakhstan, secondary data from Bureau of National Statistics (BNS) will be collected. The Bureau holds such monthly statistics. In addition, we will collect primary data from vulnerable groups and access how COVID-19 impacted them.

1. Global Food Security Index (GFSI)

In order to assess how Covid-19 affected the food security of the Republic of Kazakhstan, we will first study the main categories of food security of the Republic of Kazakhstan (such as availability, affordability, sustainability and adaptation, and quality and safety) using The Global Food Security Index and conduct a comparative analysis with the CIS countries.

The Global Food Security Index (Global Food Security Index 2022., 2022) is an outstanding source of information about the driving forces of global food security that was created by Economist Impact with assistance from Corteva Agriscience. They evaluate affordability, availability, quality and safety, and sustainability and adaptation of food security in 113 countries. The food security index is developed based on 68 distinct factors and considers not only the relationship between prices and incomes of the citizens but also the quantity, quality, and variety of the necessary number of products on the market.

The index is a dynamic benchmarking methodology for both quantitative and qualitative data that uses 68 distinct indicators to measure the factors that influence food security in both underdeveloped and wealthy nations. The 113 countries that make up the GFSI span five continents: North America, Europe, Latin America, the Middle East and Africa, and Asia Pacific. The model is updated yearly by the British magazine The Economist to account for variations in the structural factors affecting food security across time.

2. Level of self-sufficiency in basic goods

Besides the GFSI approach, in the study we will also examine the self-sufficiency of Kazakhstan in basic goods and their price change between 2019 and 2021. For the basic goods we will use 19 food items from the list of socially significant food products (SSFP).

In March 2010 the government of Kazakhstan approved the list of SSFP. Currently, the list of SSFP includes 19 products: flour, bread, macaroni, eggs, buckwheat, rice, sugar, sunflower oil and butter, some types of meat (beef, chicken), dairy products (milk, buttermilk, cottage cheese), vegetables (potatoes, carrots, onions, cabbage) and salt.

The self-sufficiency in 19 food items will be studied through the analysis of resources and consumption of each product. The resources' part is formed from local production and import of the goods, whereas the consumption part includes sales in the domestic market and export. Then the level of self-sufficiency will be calculated by dividing local production by sales in the domestic market.

3. Price change of socially significant food products

In addition, we will also study the price change of socially significant food products between 2019 and 2021. The data will be collected from BNS for each month for 2019, 2020, 2021. BNS collects pricing information immediately at the point of sale in specified settlements. Large, medium, and small trade firms, as well as marketplaces of all types, are chosen and positioned both in the settlement's core and on its outskirts.

Then the average will be calculated for the corresponding year. To measure the level of growth in prices of goods the Cumulative average growth rate (CAGR) will be calculated for each item. Another option is to calculate a simple percent change in prices by food category, from one year to the next.

We will also compare these price changes with inflation rate (Consumer Price Index) for corresponding year, retrieved from BNS.

4. Subsidies and price control

We will analyze Kazakhstan's Republican budgets from 2019 to 2023 to identify the quantity and nature of subsidies allocated to the agricultural sector. Essentially, the Republican budget outlines the funding allocated for various state development programs.

We will use the GDP by income technique, which includes product subsidies, to acquire a full picture of the level of subsidies. According to methodology for calculating gross domestic product using the income method, approved by order of the Chairman of the Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan dated September 20, 2017 No. 131, product subsidies are granted per unit of goods or services produced, in proportion to the amount or value of products and services produced, sold, or imported by inhabitants. These subsidies include:

- Regular reimbursement from the state budget for businesses that have suffered losses as a result of their selling prices being set below the average cost of production.
- Subsidies from the budget to compensate firms for losses suffered as a result of selling items and services at prices lower than market rates (e.g., at state-regulated retail prices).
- Import subsidies are paid when products enter the Republic of Kazakhstan or when non-residents give services to locals.
- Government-funded export subsidies paid when commodities leave the Republic of Kazakhstan or services are offered to non-residents.

In addition to subsidies, the Kazakhstani government has also implemented price control measures. Our approach to understanding these mechanisms involves a thorough examination of applicable laws, providing clear explanations of each mechanism, along with the specific periods during which price control was enforced.

Measures

This subsection covers variables and indicators that will be used to evaluate the Food Security of Kazakhstan. We will use three indicators: (1) Global Food Security Index; (2) Level of self-sufficiency in basic goods; (3) Price change of socially significant food products.

The table below summarizes three indicators and gives brief information about each indicator. Global Food Security Index measures the overall performance of the country in supporting food security of the country in accordance with the methodology of the Economist journal. Level of self-sufficiency in basic goods measures the capacity of the country to feed itself, in particular we calculate such level by dividing local production by local consumption. Price change of socially significant food products measures the affordability of food and will be calculated using simple percent change for 2019/2020 and 2020/2021, whereas for 2019/2021 we will use Cumulative annual growth rate.

Indicator	**What we measure**	**How we measure**	**What is a good measure**
Global Food Security Index	Overall performance of the country in supporting Food Security	According to methodology of Economist journal	From 70 to 100%
Level of self-sufficiency in basic goods	If the country can feed itself	Divide local production by local consumption	From 80 to 100%
Price change of socially significant food products	Affordability of food	Y = (X1 - X2) / X2, where Y – price change X1 – current year's price X2 – last year's price or CAGR for 2019/2021	0% and below

The Global Food Security Index assigns a score between 0 and 100 to the level of food security based on the following parameters, with the appropriate weighting factors:

1) affordability – 30,0%;

2) availability- 25,0%;

3) quality and safety – 22,5%;

4) Sustainability and adaptation– 22,5%.

The degree of food security is divided into the following categories based on the overall score:

- from 0 to 39,9 - very weak;
- from 40 to 54,9 - weak;
- from 55 to 69,9 - moderate;
- from 70 to 79.9 - good;

- 80 to 100 - very good.

The level of self-sufficiency will give understanding how much of local consumption is covered by local production. For example, if 100 units of good are produced locally and 50 units are sold domestically, then the level of self-sufficiency is 200% (100/50). Any result above 100% is a good indicator of self-sufficiency. In other words, local production covers domestic needs by 200%. We will present the results of this analysis for three full years 2019, 2020, and 2021 since the data is available only for these years in BNS.

To measure the level of growth in prices of goods a simple percent change in prices by food category from one year to the next and Cumulative average growth rate (CAGR) will be calculated for each item for 2019/2021.

Data collection

The potential study will include both primary and secondary data collection. Primary data will be collected using google survey forms by conducting surveys among Kazakhstani people to collect data on how COVID-19 impacted them in terms of food issues. The survey will be held later after careful designing of survey questions.

We will collect more than 40 responses since this number should increase the validity of the sample. Respondents will receive a direct link to surveys through available messengers. Our surveys will have multiple choice questions with the possibility to add own answer. Then answers will be categorized and each category will receive share of total answers. We expect that most respondents will emphasize the price growth of basic goods as the main impact of COVID-19.

Collection of secondary data will help us to see the full picture of the COVID's influence on Food Security in Kazakhstan. We will use secondary data, particularly aggregate data, from British Magazine the Economist, Bureau of national statistics of the Agency for strategic planning and reforms of the Republic of Kazakhstan (BNS), academic literature, international and government reports, and other available resources in the internet.

RESULTS/FINDINGS

Food security plays an important role in economic security in the Republic of Kazakhstan. The role of food security is enshrined in the Law of the Republic of Kazakhstan «On National Security of the Republic of Kazakhstan». In order to ensure the country's food security, the Government of the Republic of Kazakhstan has approved a Plan to ensure the food security of the Republic of Kazakhstan for 2022-2024 (A Plan to Ensure Food Security for the Medium Term Has Been Considered in Kazakhstan – E. Karashukeev., 2022). "The issue of food security is one of the main conditions for ensuring the national security of the country," said E. Karashukeev, Minister of Agriculture of the Republic of Kazakhstan.

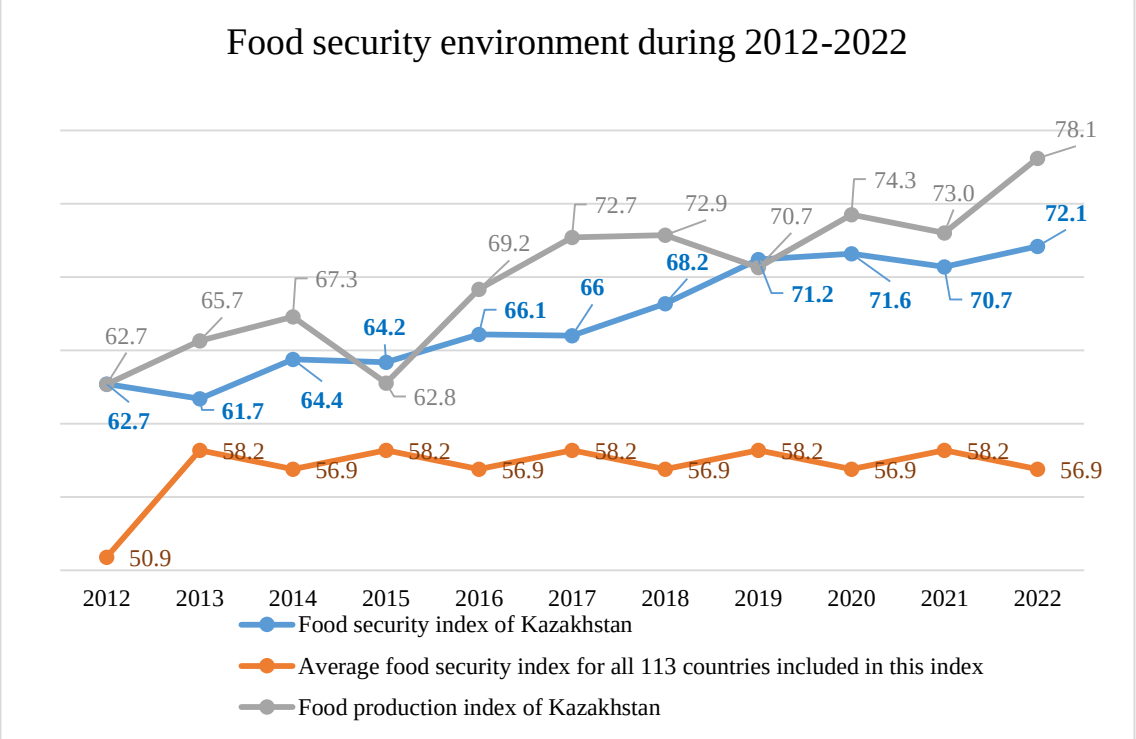
Global Food Security Index

According to the Global Food Security Index for 2022, conducted by the British Magazine The Economist, Kazakhstan ranked 32nd out of 113 (see table 1 in Appendix). The country's index was 72.1.

As we can see from Table 2, Kazakhstan has been experiencing an annual steady increase in the food security index since 2012. Even during the years of the pandemic in 2019-2021, growth continued without having a negative impact. There was only a slight decrease in 2021 by 0.9 points mostly due to methodology changes of GFSI. This indicates that Kazakhstan has been able to largely maintain the main criteria of food security such as:

- Food affordability;
- Food availability;
- Food quality and safety;
- As well as Sustainability and adaptation.

Table 2. Food security environment of Kazakhstan during 2012-2022



Source: Global Food Security Index 2022

In 2022, the affordability index of the Republic of Kazakhstan (see table 3 in appendix) was 78.0 (good), availability — 67.2, quality and safety — 76.3 (good), sustainability and adaptation — 65.4 (moderate) (see table 2). The country's average food security index was 72.1 which is good.

Compared to 2019, the overall food security index in 2022 (see table 4 in appendix) increased by 0.9 points. In terms of indicators, food affordability decreased by 3.4 points and Kazakhstan ranked 49th out of 113 countries, moving up 2 positions, on this metric. In turn, food availability in the country raised by 6 points and by this criterion the Kazakhstan placed 23rd out of 113 countries, having increased by 26 positions during this period. Food quality and safety decreased over the year by 3 points and is staying at the same 32nd rank. And the last, but not the least, sustainability and adaptation of food increased by 4.6 points, having risen by 2 positions in the rank.

Comparing the indicators of food security in 2022 with 2019, we see that Covid-19 has not had a significant impact on the food security of the Republic of Kazakhstan. On the contrary, such indicators as accessibility and sustainability and adaptation have increased due to timely measures taken by the Government of the Republic of Kazakhstan. For instance, the Government of the Republic of Kazakhstan decided to allocate 32 billion

tenge in the first month of the pandemic in March 2020 to maintain food security and replenish Stabilization Funds (32 Billion Tenge Will Be Allocated to Ensure Food Security — Tugzhanov, 2020).

Also, according to Table 5 in appendix, we see that Kazakhstan has a steady increase in the food security index, some indicators even exceed the average level of the index of 113 countries.

We also calculated a correlation between Food security index of Kazakhstan and Food production index of Kazakshstan, and found very high correlation 0,85 and R^2 0,73. This means that 73% of Food security index of Kazakhstan is consist of its food production. This states that Kazakhstan is a food production country.

We also made a comparison of the food security index of Kazakhstan with the CIS countries, because we have a similar economy, we depend on the export of raw materials, and we also pay great attention to the agro-industry. As we can see from Table 6 among the CIS countries, Kazakhstan has the highest rating (32nd place), followed by Russia (43th place), Belarus (55th place), Azerbaijan (66th place), Ukraine (71st place), Uzbekistan (73d place) and Tajikistan (75th place). Therefore, we can see that Kazakhstan has the highest food security index among CIS countries, which is very good.

Table 6 Comparison of the food security index of Kazakhstan with the CIS countries

Rank	Country	2012	2013	2014	2016	2018	2019	2020	2021	2022
32	Kazakhstan	62,7	61,7	64,4	66,1	68,2	71,2	71,6	70,7	72,1
43	Russia	63,0	64,6	63,7	61,1	70,9	70,9	71,2	71,7	69,1
55	Belarus	60,2	60,5	63,9	65,6	69,7	71,6	69,4	69,1	64,5
66	Azerbaijan	56,9	61,6	63,8	62,8	58,2	62,4	63,3	60,8	59,8
71	Ukraine	55,8	54,3	56,8	49,5	52,4	55,5	57,8	60,6	57,9
73	Uzbekistan	50,4	51,4	49,9	55,0	52,1	51,4	53,1	54,5	57,5
75	Tajikistan	47,1	52,0	51,5	51,3	52,3	56,0	55,0	54,4	56,7

Source: Global Food Security Index 2022

Self-sufficiency of Kazakhstan in 19 socially significant food products and its price change

Even though Kazakhstan has a good index of GFSI, we also examined the level of self-sufficiency of Kazakhstan in 19 socially significant food products. In table 7 (in

appendix), among 19 food items, Kazakhstan has a high level of self-sufficiency in 17 products, whereas a low level of self-sufficiency is observed only in two items: sugar and cottage cheese. Between 2019 and 2021 the levels of self-sufficiency for fresh produce like carrots, onions, cabbage slightly decreased. The level of self-sufficiency in foods hasn't been significantly impacted by COVID-19 outbreak.

In addition to examining the self-sufficiency in basic goods, the price change was also studied for 2019-2021 (see table 8 in appendix). 16 goods out of 19 increased in price between 2019 and 2021 with different CAGR, whereas other 3 goods either stayed unchanged or decreased in price. The major increase in price was observed for buckwheat - 37%, sunflower oil - 28%, and potato - 23%. The price of cottage cheese was almost unchanged, whereas the price of onion and white cabbage decreased by 6% and 9%, respectively.

The consumer price index (CPI) in Kazakhstan for 2019 was 5.24%, for 2020 was 6.8%, and for 2021 was 8%. In 2019 10 goods out of 19 increased in price more than CPI for that year (5.24%). In 2020 was a similar situation - 10 goods out of 19 increased in price more than CPI for that year (5.24%).

From here, we observe that during COVID-19 years the prices of most socially significant food products increased with different growth rates. That implies that the affordability of food has decreased.

Conducted Survey

We conducted a survey of 111 respondents on whether COVID-19 affected the food security of the Republic of Kazakhstan (see table 9 in appendix). The answers to the questions were grouped into the following main categories of food security of the Republic of Kazakhstan, such as availability, affordability, as well as quality and safety.

Food availability. As you can see, 74% of respondents said that they did not experience a shortage of food products in stores during the COVID-19 pandemic. 80% of respondents said that the family did not face problems in getting enough food during the pandemic. Also, 89% of respondents said that they did not reduce their food intake by reducing the portion of food or the number of meals due to the consequences of the pandemic. This result indicates that the majority of respondents did not face serious problems of food availability during the pandemic.

Food affordability. 68% of respondents said that the cost of food products in their region increased during the pandemic. This may indicate that the economic impact of the pandemic has led to an increase in the prices of some products, which may have an impact on the financial situation of households.

Food quality and safety. As for the quality and safety of food during the pandemic, 72% of respondents said nothing has changed. This is a positive result, which indicates that food remained safe to eat, despite the difficulties associated with the pandemic.

Subsidies and price control

Furthermore, both prior to and amidst the COVID-19 pandemic, the Kazakhstani government employed subsidies to bolster the agricultural sector and instituted price control measures to maintain food prices at an affordable level. These steps guaranteed the accessibility and cost-effectiveness of food.

We examined the Republican budgets of Kazakhstan for several years. In 2019, there were 5 types of subsidies. However, in 2020, during the COVID-19 pandemic, the number of subsidies increased to 12 types. In the subsequent years, the number of subsidies gradually decreased. In 2021, there were 9 types of subsidies; in 2022, there were 11 types, and finally, in 2023, the number of subsidies decreased to 2 types. The table 10 (see in appendix) provides detailed information on the types of subsidies for each year.

To gain a comprehensive understanding of the amount of subsidies, we employed the GDP by income method. Before the COVID-19 pandemic, product subsidies remained relatively consistent, constituting 0.3% of GDP. However, starting in 2020, product subsidies increased to 0.4% of GDP. This increase indicates the pandemic's influence on subsidy amounts.

Table 11. Product subsidies

Year	Amount in millions of tenge	Percentage of GDP
2015	122,810.6	0.3%
2016	143,451.8	0.3%
2017	188,984.9	0.3%
2018	164,369.2	0.3%
2019	206,349.3	0.3%
2020	248,281.8	0.4%
2021	305,616.4	0.4%

2022	381,405.8	0.4%

The government of Kazakhstan has been employing price control measures both before and after the onset of the COVID-19 pandemic. All these mechanisms for price control are explicitly outlined in the 'Rules for establishing threshold values of retail prices for socially significant food products and the size of maximum permissible retail prices for them'.

These rules were formulated in accordance with subparagraph 15) of Article 7 of the Republic of Kazakhstan's Law 'On Regulation of Trade Activities'. They define the method for calculating retail price thresholds for socially significant food products and the maximum allowable retail prices for them. Introduced in 2015, these rules remain in effect through 2023.

The maximum allowable trade markup for socially important food products is capped at no more than 15% of the manufacturer's selling price or the purchase price from a wholesale supplier as stated in the supply agreement (Article 9). Essentially, this means that for 19 types of socially significant food products, the trade margin should not surpass 15%.

Violation of this 15% cap carries administrative penalties. Prices for socially important food products undergo weekly monitoring by akimats, the Ministry of Trade, the Agency for the Protection and Development of Competition, and other government bodies.

DISCUSSIONS

The findings presented in the study offer valuable insights into Kazakhstan's food security situation and the impact of the COVID-19 pandemic on various aspects of the country's food system. Drawing from the literature review and the findings, here are the discussions:

Global Food Security Index: Kazakhstan's performance in the Global Food Security Index (GFSI) for 2022, as reported by The Economist, is a noteworthy starting point for discussion. Kazakhstan's ranking at 32nd out of 113 countries with an index of 72.1 suggests that the country has maintained a commendable level of food security. It is essential to emphasize the consistency of improvement in Kazakhstan's GFSI over the years, indicating sustained efforts in enhancing food security.

Impact of COVID-19 on Food Security: The study's analysis of the GFSI data from 2012 to 2022 reveals that the pandemic did not have a significant adverse impact on Kazakhstan's food security. During this time, the country was able to maintain and even increase its food security metrics. This favorable outcome might be due to prompt government actions, such as the release of funding to preserve food security, as evidenced in the allocation of 32 billion tenge in March 2020.

Self-Sufficiency in Food Production: Although it has a high GFSI grade, the research also looks at Kazakhstan's degree of self-sufficiency in socially important food goods. The results show that the nation has high levels of food self-sufficiency for the majority of its food staples, with just slight declines in self-sufficiency noted for a few. This implies that maintaining food availability is mostly dependent on domestic production in Kazakhstan.

Price Changes: The examination of price fluctuations for food items that hold social significance from 2019 to 2021 highlights the financial consequences of the epidemic. Food became less affordable overall during this time, despite notable price hikes for particular categories. This specific feature bears significant importance as it illustrates the many obstacles households may have in upholding their food consumption habits.

Survey Results: A survey with 111 participants is included, and it offers insightful qualitative information about how COVID-19 affects food security. Remarkably, most

respondents did not mention having serious problems with food supply throughout the outbreak. Nonetheless, worries over the rising price of food items in some areas draw attention to how crucial affordability is as a component of food security.

Government Measures: The research highlights the significance of governmental subsidies and price control measures in preserving food security. In reaction to the epidemic, the Kazakh government modified its subsidy policy, boosting assistance for agriculture. Amidst the epidemic, there was a noticeable surge in product subsidies, which can be attributed to the government's attempts to stabilize the food supply chain.

Price Control Mechanisms: The analysis highlights the critical significance that price control systems that were put in place prior to and throughout the epidemic play in guaranteeing affordability. The government's dedication to controlling food costs and safeguarding consumers is evident in the maximum permitted trade markup and administrative fines for price infractions, though this regulation was found to be ineffective.

In summary, Kazakhstan has demonstrated its capacity to sustain and enhance food security despite the obstacles presented by the COVID-19 epidemic, as seen by its ranking in the Global Food Security Index. The findings suggest that timely government measures, including subsidies and price control mechanisms, played a crucial role in mitigating the pandemic's impact. However, the study also highlights the importance of monitoring affordability and addressing price increases to ensure that food remains accessible to all segments of the population.

CONCLUSIONS

In summarizing our research, we found that Kazakhstan's food security index has been steadily rising each year since 2012. Growth persisted during the pandemic years in 2019–2020 without having a negative effect.

We can observe that Covid-19 has not significantly affected the food security of the Republic of Kazakhstan by comparing the indices of food security in 2022 with those in 2019. Contrarily, as a result of prompt action taken by the Government of the Republic of Kazakhstan, such indicators as accessibility, sustainability, and adaptation have improved.

In addition to the Food Security Index, we also performed our own analysis of self-sufficiency and price changes of socially significant food products between 2019 and 2021. We found that Kazakhstan was self-sufficient in 17 out of 19 basic foods, and price increases were observed in most of the socially significant food products.

Though Kazakhstan has strong support for agriculture, prices increased for most basic goods. To support the last observation, we conducted a survey among people of Kazakhstan. Based on the survey conducted, conclusions can be drawn about the impact of COVID-19 on food security in the Republic of Kazakhstan. The majority of respondents did not experience a shortage of food, but noticed an increase in food prices. Nevertheless, the quality and safety of the products remained stable.

These results highlight the importance of maintaining a stable food supply and price control in a pandemic to ensure the food security of the population. It can also serve as a basis for the development and implementation of policies aimed at ensuring the availability and quality of products in a crisis.

Subsidies played a vital role in supporting agriculture and ensuring food affordability and availability both before and during the COVID-19 pandemic. The government employed various subsidy types, which underwent notable changes over the years. Starting with five types in 2019, they increased to twelve in 2020 during the pandemic, gradually decreasing in subsequent years to two types in 2023.

Moreover, the government implemented robust price control mechanisms to limit the trade markup for socially important food products to 15%, ensuring fair pricing.

However, this instrument was ineffective since some goods increased significantly in price.

According to a comprehensive analysis of this research, Kazakhstan was able to improve its performance during the quarantine period, proving the effectiveness of government initiatives to encourage the growth of agricultural producers to maintain continuous food delivery.

Based on our comprehensive analysis we have some policy recommendations to support Food Security of Kazakhstan:

Eliminate Regulation on Social Products: This recommendation suggests removing price regulations on social products. The idea behind this is that these products are already accessible to all people, and by eliminating price regulations, you might encourage market competition, potentially leading to innovation and lower prices in the long run. However, it's important to ensure that this approach doesn't lead to exploitation or monopolistic practices, ensuring fair business practices is key.

Targeted Assistance Programs (Like Food Stamps in the US): Implementing targeted assistance programs, similar to the food stamps system in the US, can be an effective way to ensure that those in need receive essential social products. These programs can be means-tested, meaning they are available to individuals or families based on their income and need. This ensures that assistance is directed to those who require it the most, improving social equity and reducing poverty.

Develop Infrastructural Projects (Food Processing and Storage): Investing in infrastructural projects, such as food processing and storage facilities, helps to smooth out seasonal fluctuations in food prices. Processing facilities can help in preserving surplus produce, reducing waste, and providing a more consistent supply throughout the year. Storage facilities can be used to store excess produce during times of plenty and release it into the market during scarcity, stabilizing prices and ensuring a more reliable supply chain.

Implementing these recommendations requires careful planning, monitoring, and collaboration between government agencies, private sectors, and communities to ensure their effectiveness and to avoid unintended consequences. Additionally, continuous

evaluation and adaptation of these strategies based on real-time data and feedback are crucial for their long-term success.

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APPENDIX

Table 1 Rating, food security environment in 2022, best to worst (113 countries)

Rank	Δ	Country	2012	2013	2014	2016	2018	2019	2020	2021	2022	Δ
1	↔	Finland	78,4	78,2	78,3	83,0	83,8	83,6	84,3	82,7	83,7	+1,0
2	↔	Ireland	76,9	78,0	78,2	80,7	82,4	82,7	82,4	81,6	81,7	+0,1
3	▲5	Norway	80,9	81,5	81,9	81,2	82,3	81,7	80,9	78,4	80,5	+2,1
4	▲5	France	76,8	76,3	77,2	76,9	78,4	77,9	78,0	78,3	80,2	+1,9
5	▼2	Netherlands	73,4	76,7	76,2	76,2	80,7	80,9	79,5	79,9	80,1	+0,2
21	▼1	Poland	68,5	71,3	72,3	72,9	73,0	75,5	75,0	75,0	75,5	+0,5
22	▲15	Australia	70,8	73,8	76,1	75,6	77,1	75,7	73,8	70,7	75,4	+4,7
23	▲3	United Arab Emirates	63,2	61,4	62,1	60,3	71,6	72,9	73,7	73,6	75,2	+1,6
=25	▲14	China	60,5	66,0	67,9	70,7	71,6	73,4	70,3	70,6	74,2	+3,6
27	▼2	Italy	71,5	70,3	74,2	74,2	74,2	74,6	75,1	74,1	74,0	-0,1
28	▲1	Singapore	68,4	70,1	72,3	70,8	72,4	74,7	74,7	72,8	73,1	+0,3
29	▲3	Bulgaria	63,5	64,5	65,1	68,1	66,4	68,2	68,7	72,2	73,0	+0,8
30	▼9	Qatar	69,9	70,1	72,8	72,0	73,0	73,8	74,0	74,6	72,4	-2,2
31	▼1	Greece	67,5	70,9	72,7	75,3	76,4	75,7	75,6	72,5	72,2	-0,3
32	▲5	Kazakhstan	62,7	61,7	64,4	66,1	68,2	71,2	71,6	70,7	72,1	+1,4
33	▲9	Uruguay	60,9	66,9	67,0	69,8	75,3	74,2	74,1	69,2	71,8	+2,6
34	▲11	Hungary	66,1	66,1	68,5	72,6	71,1	71,0	71,1	68,5	71,4	+2,9
35	▼4	Oman	57,4	59,4	64,6	70,1	73,3	72,2	72,0	72,3	71,2	-1,1
=41	▲5	Saudi Arabia	58,1	61,0	62,9	64,5	67,3	65,0	69,1	68,2	69,9	+1,7
=43	▼7	Mexico	61,8	61,4	64,6	65,4	65,6	68,8	70,4	70,9	69,1	-1,8
=43	▼10	Russia	63,0	64,6	63,7	61,1	70,9	70,9	71,2	71,7	69,1	-2,6
45	▼5	Romania	63,0	64,5	66,6	68,7	69,2	70,5	71,7	69,3	68,8	-0,5
49	↔	Turkey	62,4	61,8	64,2	65,0	65,2	64,4	61,5	65,6	65,3	-0,3
54	↔	Argentina	63,5	63,4	63,6	64,4	64,5	62,3	65,5	64,7	64,8	+0,1
55	▼12	Belarus	60,2	60,5	63,9	65,6	69,7	71,6	69,4	69,1	64,5	-4,6
56	▲5	El Salvador	58,8	61,7	61,1	59,4	62,9	62,8	60,8	62,3	64,2	+1,9
57	↔	Morocco	53,9	54,8	56,0	58,2	63,5	61,4	64,9	64,3	63,0	-1,3
=64	▼1	Thailand	55,5	57,4	57,9	59,0	61,7	62,4	61,4	62,1	60,1	-2,0

Rank	Δ	Country	2012	2013	2014	2016	2018	2019	2020	2021	2022	Δ
66	▼1	Azerbaijan	56,9	61,6	63,8	62,8	58,2	62,4	63,3	60,8	59,8	-1,0
71	▼5	Ukraine	55,8	54,3	56,8	49,5	52,4	55,5	57,8	60,6	57,9	-2,7
72	▲1	Myanmar	49,4	50,3	52,7	53,0	57,2	56,2	54,7	58,3	57,6	-0,7
73	▲6	Uzbekistan	50,4	51,4	49,9	55,0	52,1	51,4	53,1	54,5	57,5	+3,0
74	▲2	Nepal	45,8	47,9	50,3	52,4	56,8	56,5	56,0	55,1	56,9	+1,8
75	▲5	Tajikistan	47,1	52,0	51,5	51,3	52,3	56,0	55,0	54,4	56,7	+2,3
76	▼2	Nicaragua	50,3	52,6	52,8	54,4	56,8	55,7	57,6	57,6	56,6	-1,0
110	▼4	Sierra Leone	41,5	42,6	46,7	46,6	40,1	42,4	45,7	42,9	40,5	-2,4
111	▼2	Yemen	40,0	42,5	41,2	43,3	38,9	38,1	39,9	39,8	40,1	+0,3
112	↔	Haiti	43,9	46,0	46,5	45,4	41,7	37,9	36,2	38,5	38,5	0
113	↔	Syria	46,8	42,4	42,0	40,0	39,9	45,0	38,5	36,2	36,3	+0,1

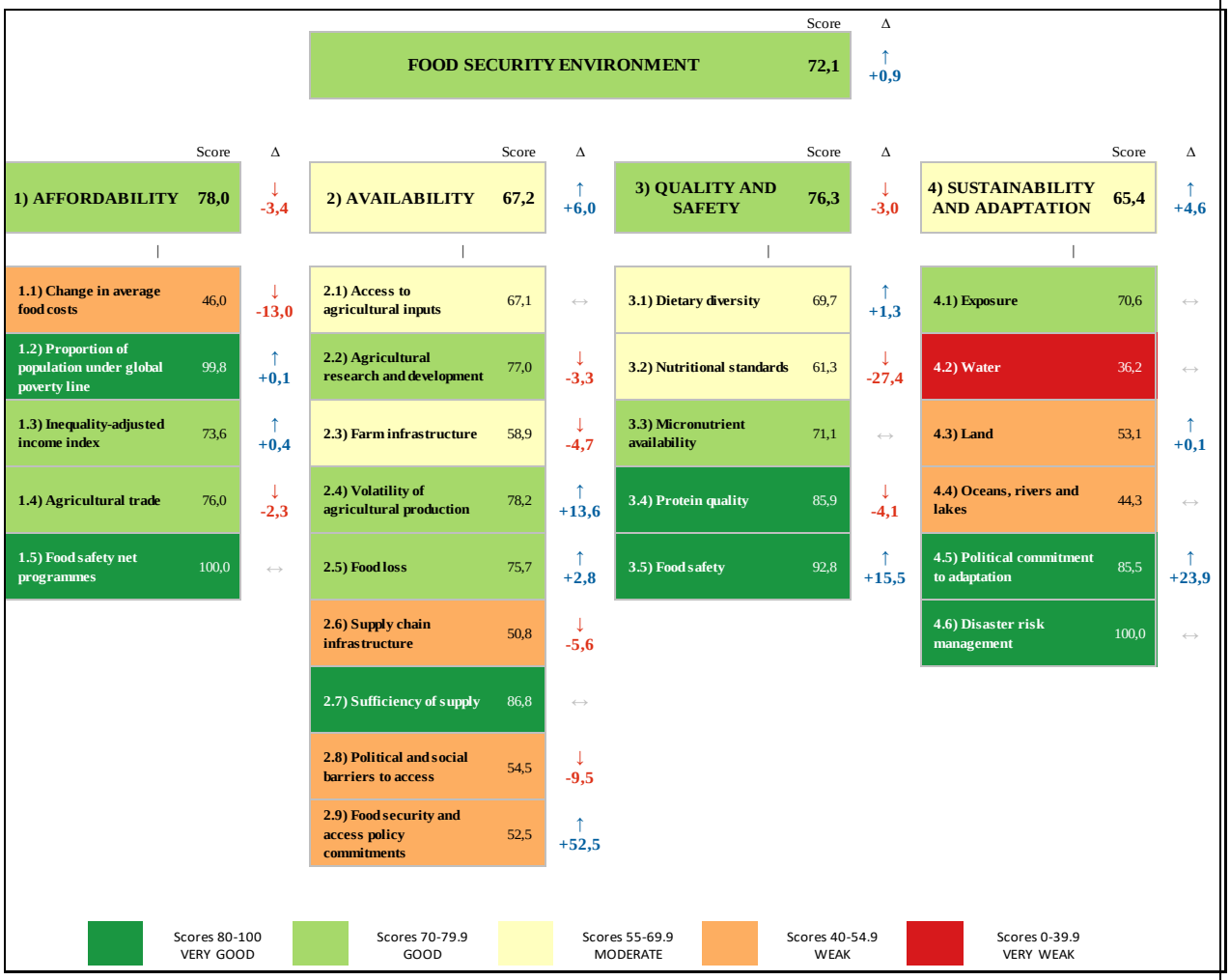
Scores are normalized 0-100, where 100=best conditions

Δ = change in score / rank, 2022 compared with 2021

▲ *= Rank improved* ▼ *= Rank deteriorated* ↔ *= No change in rank*

Source: Global Food Security Index 2022

Table 3 Assessment of food security of Kazakhstan in 2022 compared with 2019



Scores are normalized 0-100, where 100=best conditions

Δ = change in score, 2022 compared with 2019

↑ = Score improved ↓= Score deteriorated - = no change in score

Source: Global Food Security Index 2022

Table 4 Indicators of food security of Kazakhstan in 2022 compared with 2019

Series	Score bar chart	Score	Δ	Rank	Δ
FOOD SECURITY ENVIRONMENT	good	**72,1**	**+0,9**	**32**	**▲5**
1) AFFORDABILITY	good	78,0	-3,4	49	▲2
2) AVAILABILITY	moderate	67,2	+6,0	=23	▲26
3) QUALITY AND SAFETY	good	76,3	-3,0	=32	↔
4) SUSTAINABILITY AND ADAPTATION	moderate	65,4	+4,6	22	▲2

Series	Score bar chart	Score	Δ	Rank	Δ
1) AFFORDABILITY	good	**78,0**	**-3,4**	**49**	**▲2**
1.1) Change in average food costs	weak	46,0	-13,0	97	↔
1.2) Proportion of population under global poverty line	very good	99,8	+0,1	=12	↔
1.3) Inequality-adjusted income index	good	73,6	+0,4	23	▼2
1.4) Agricultural trade	good	76,0	-2,3	=18	▲18
1.5) Food safety net programmes	very good	100,0	0	=1	↔
2) AVAILABILITY	moderate	**67,2**	**+6,0**	**=23**	**▲26**
2.1) Access to agricultural inputs	moderate	67,1	0	=34	▼6
2.2) Agricultural research and development	good	77,0	-3,3	7	▼1
2.3) Farm infrastructure	moderate	58,9	-4,7	=52	▼21
2.4) Volatility of agricultural production	good	78,2	+13,6	=45	▲26
2.5) Food loss	good	75,7	+2,8	=62	▲10
2.6) Supply chain infrastructure	weak	50,8	-5,6	51	▼10
2.7) Sufficiency of supply	very good	86,8	0	=24	▲1
2.8) Political and social barriers to access	weak	54,5	-9,5	=62	▼16
2.9) Food security and access policy commitments	weak	52,5	+52,5	=27	▲43
3) QUALITY AND SAFETY	good	**76,3**	**-3,0**	**=32**	↔
3.1) Dietary diversity	moderate	69,7	+1,3	6	▲3
3.2) Nutritional standards	moderate	61,3	-27,4	=52	▼28
3.3) Micronutrient availability	good	71,1	0	54	↔
3.4) Protein quality	very good	85,9	-4,1	35	▼3
3.5) Food safety	very good	92,8	+15,5	=46	▲22
4) SUSTAINABILITY AND ADAPTATION	moderate	**65,4**	**+4,6**	**22**	**▲2**
4.1) Exposure	good	70,6	0	46	↔
4.2) Water	very weak	36,2	0	=57	▲1
4.3) Land	weak	53,1	+0,1	88	▼1
4.4) Oceans, rivers and lakes	weak	44,3	0	=47	↔
4.5) Political commitment to adaptation	very good	85,5	+23,9	21	▲13
4.6) Disaster risk management	very good	100,0	0	=1	↔

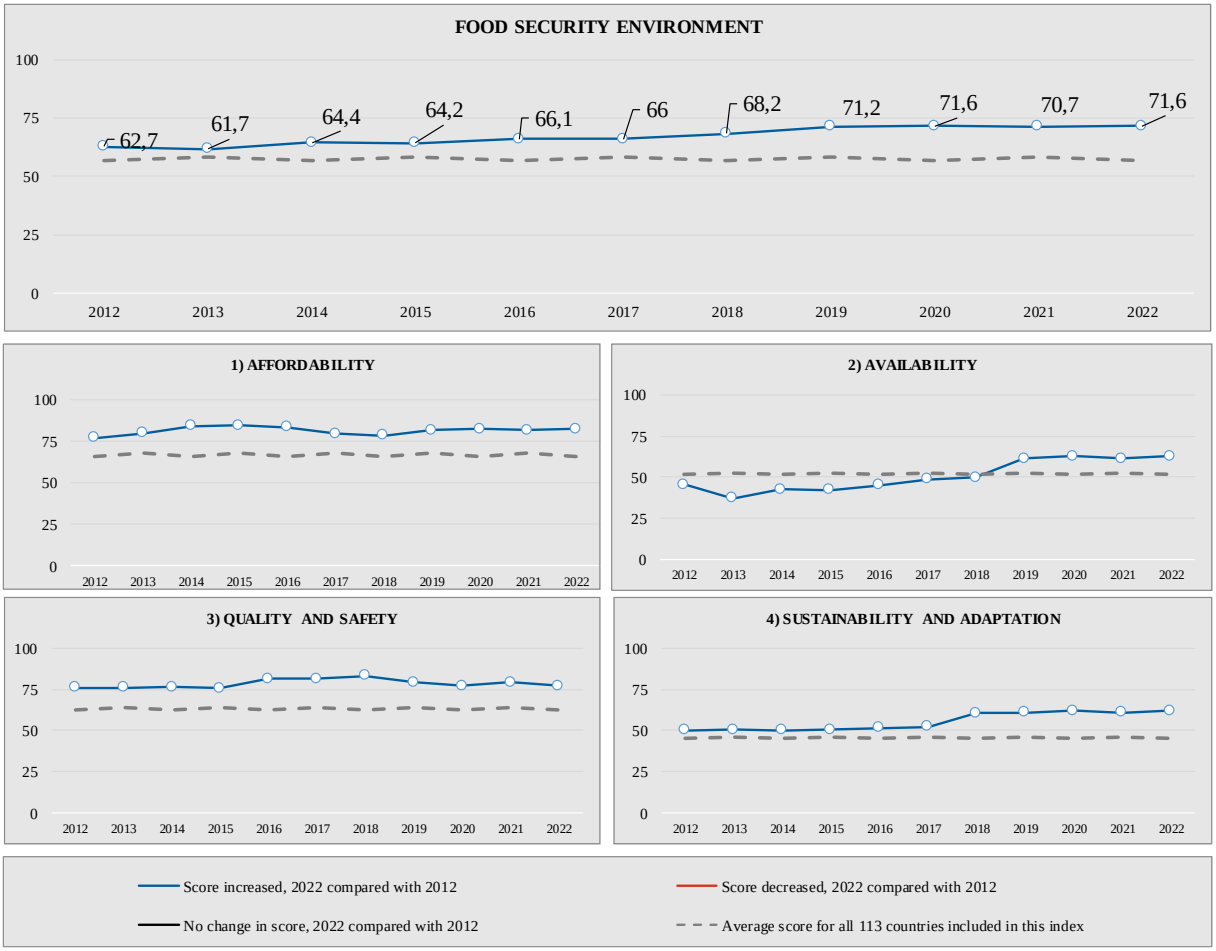
Δ = change in score / rank, 2022 compared with 2019

▲ = Rank improved ▼ = Rank deteriorated ↔ = No change in rank

Rank out of 113 countries where 1=best. '=' denotes tie in rank.

Source: Global Food Security Index 2022

Table 5 Performance of Kazakhstan for the entire index period (2012-2022)



Source: Global Food Security Index 2022

Table 7 Level of self-sufficiency in socially significant food products in Kazakhstan

No.	Socially significant food product	2019	2020	2021
1	Flour	205%	225%	199%
2	Bread, cakes and confectionery, bakery products	97%	96%	95%
3	Macaroni, noodles, couscous and similar flour products	108%	117%	124%
4	Eggs	106%	100%	99%
5	Buckweat	103%	109%	111%
6	Rice	172%	191%	177%
7	Sugar	45%	22%	42%
8	Sunflower oil	91%	102%	98%

No.	Socially significant food product	2019	2020	2021
9	Butter	90%	83%	98%
10	Meat and poultry, edible offal	86%	86%	88%
11				
12	Liquid processed milk and cream	103%	102%	101%
13	Fermented yoghurt, milk and cream	89%	89%	89%
14	Cheese and cottage cheese	59%	54%	56%
15	Potatoes	106%	108%	103%
16	Carrots	97%	97%	93%
17	Onions	97%	95%	89%
18	Cabbage	97%	98%	89%
19	Salt	270%	233%	234%

Source: Authors' calculations based on data from Bureau of national statistics of the Agency for strategic planning and reforms of the Republic of Kazakhstan

Table 8 Price change of socially significant food products in Kazakhstan, tenge/kg (if otherwise not stated)

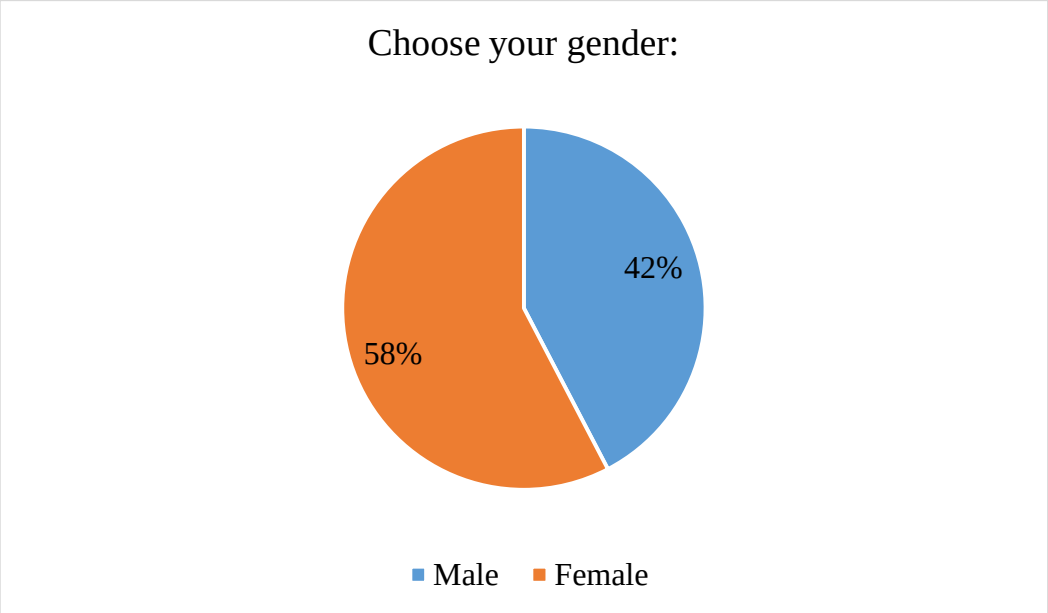
No.	Socially significant food product	2019	2020	2021	Change 2019-20	Change 2020-21	CAGR 2019-21
1	Wheat flour of the 1st grade	146	176	182	20%	4%	12%
2	Wheat bread from flour of the 1st grade	139	151	159	9%	5%	7%
3	Macaroni	271	316	352	17%	11%	14%
4	Eggs 1 category, ten	266	304	384	15%	26%	20%
5	Buckwheat	255	377	481	48%	28%	37%
6	Rice, polished	354	375	367	6%	-2%	2%
7	Sugar	228	214	276	-6%	29%	10%
8	Sunflower oil, liter	433	461	707	6%	53%	28%

No.	Socially significant food product	2019	2020	2021	Change 2019-20	Change 2020-21	CAGR 2019-21
9	Butter, unsalted	2 227	2 570	2 792	15%	9%	12%
10	Beef with bones	1 666	1 896	2 160	14%	14%	14%
11	Chicken legs	788	825	864	5%	5%	5%
12	Pasteurized milk 2.5%, liter	233	253	251	8%	0%	4%
13	Buttermilk 2.5%, liter	274	288	283	5%	-2%	2%
14	Cottage cheese, 5-9%	1 571	1 644	1 568	5%	-5%	0%
15	Potato	97	117	147	20%	26%	23%
16	Carrot	116	116	170	-1%	47%	21%
17	Onion	106	94	95	-12%	1%	-6%
18	White cabbage	125	93	103	-25%	10%	-9%
19	Salt, except extra	52	52	54	0%	3%	2%

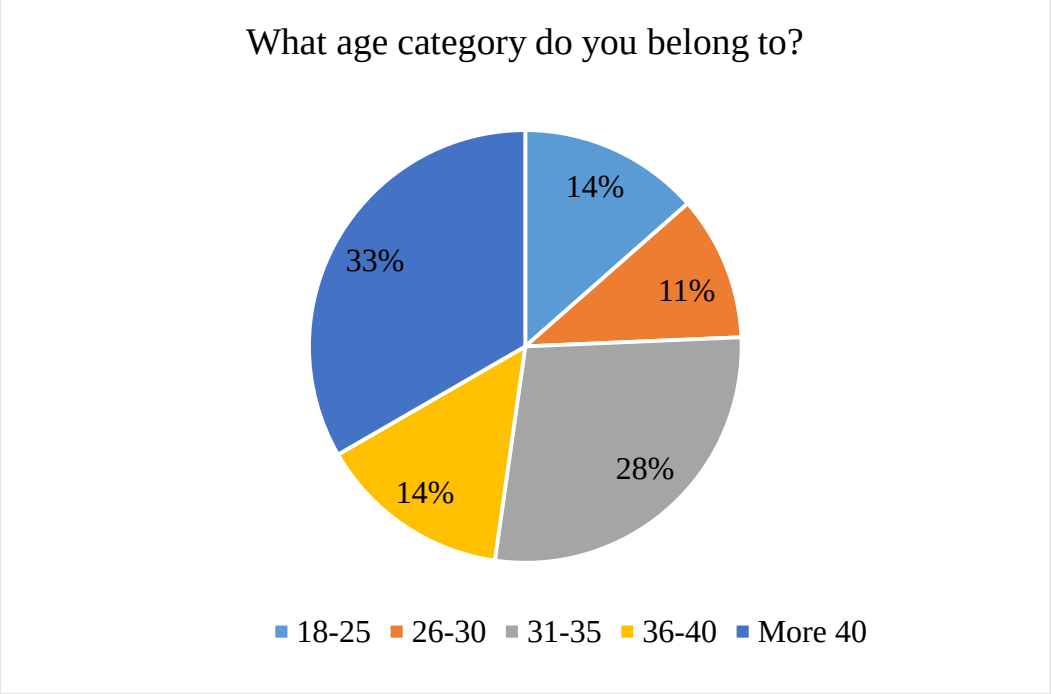
Source: Authors' calculations based on data from Bureau of national statistics of the Agency for strategic planning and reforms of the Republic of Kazakhstan

Table 9 Survey questions and answers

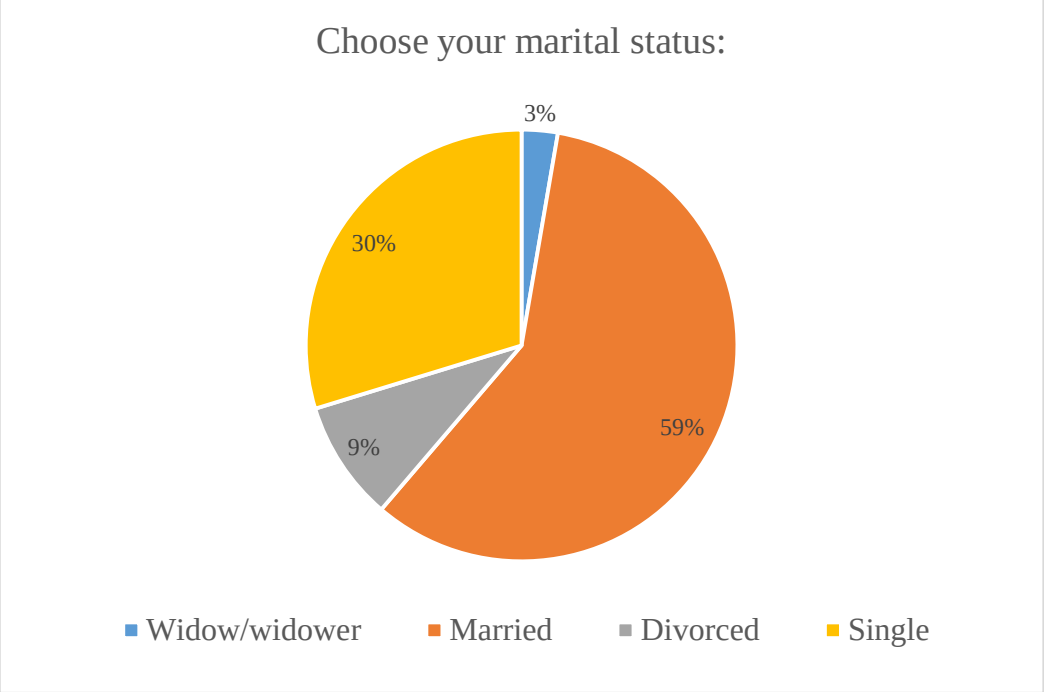
Question 1



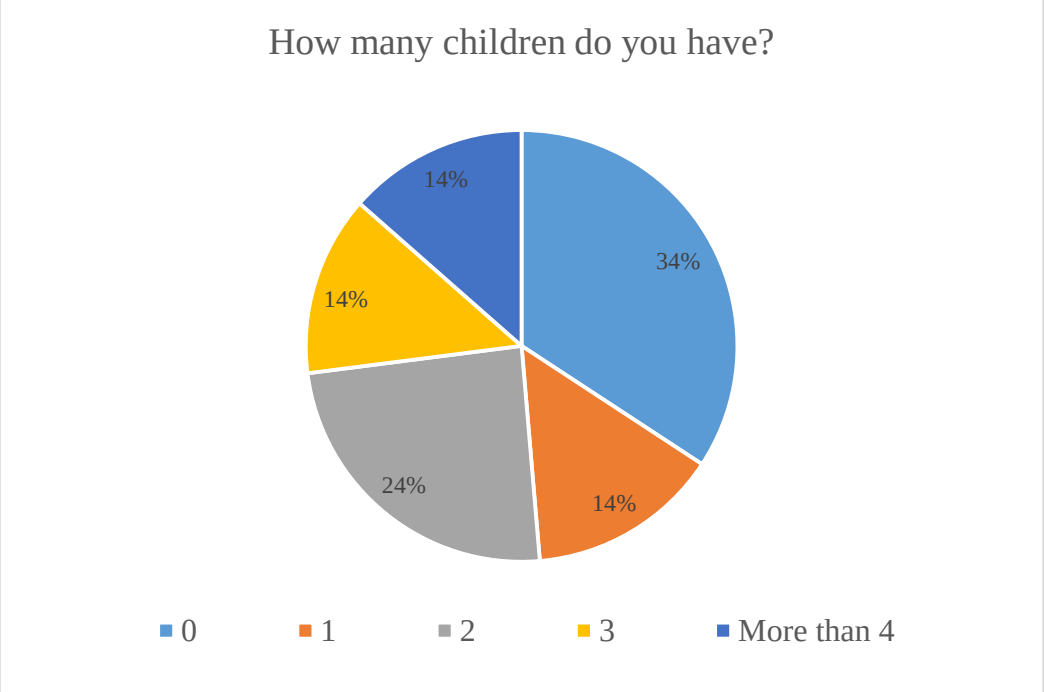
Question 2



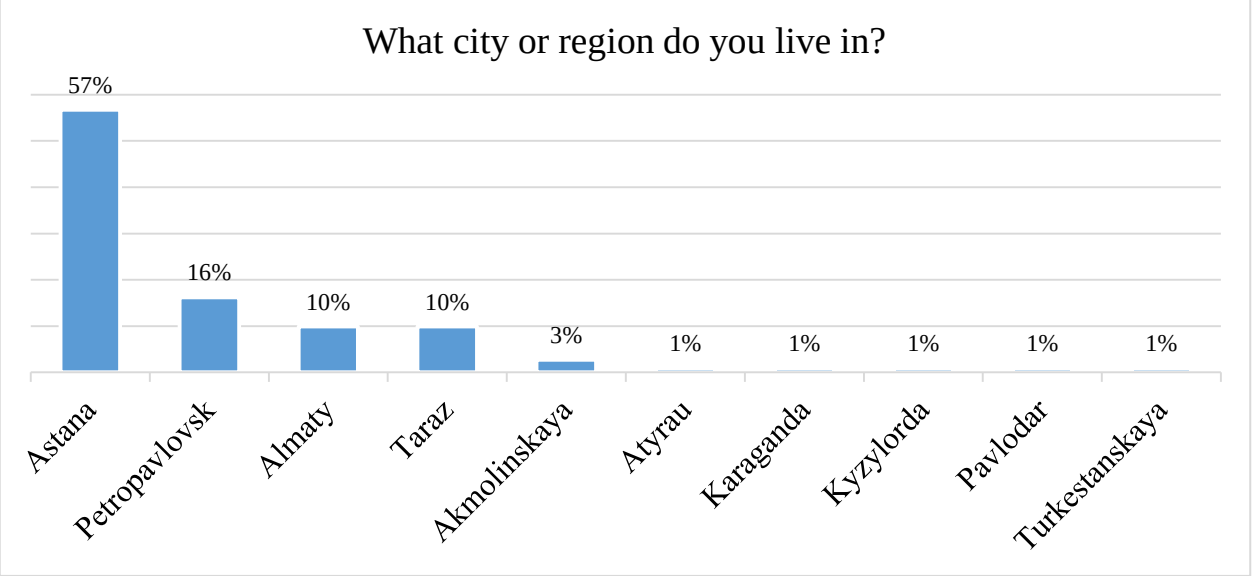
Question 3



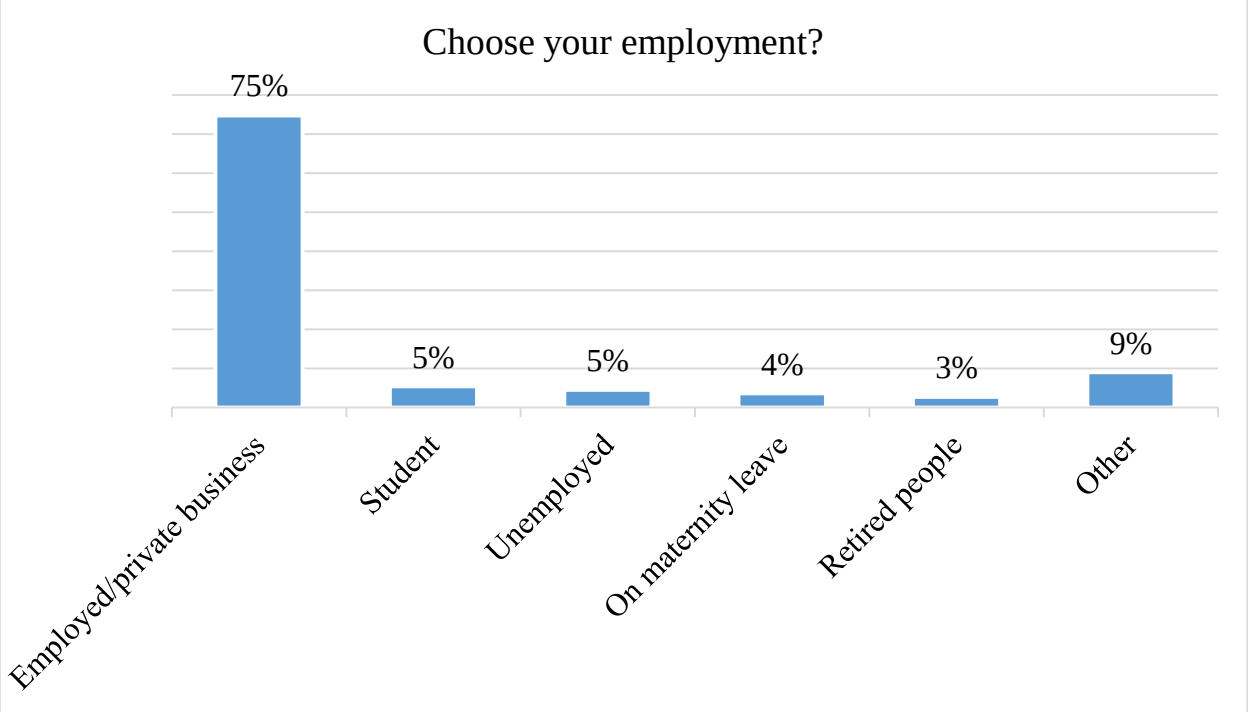
Question 4



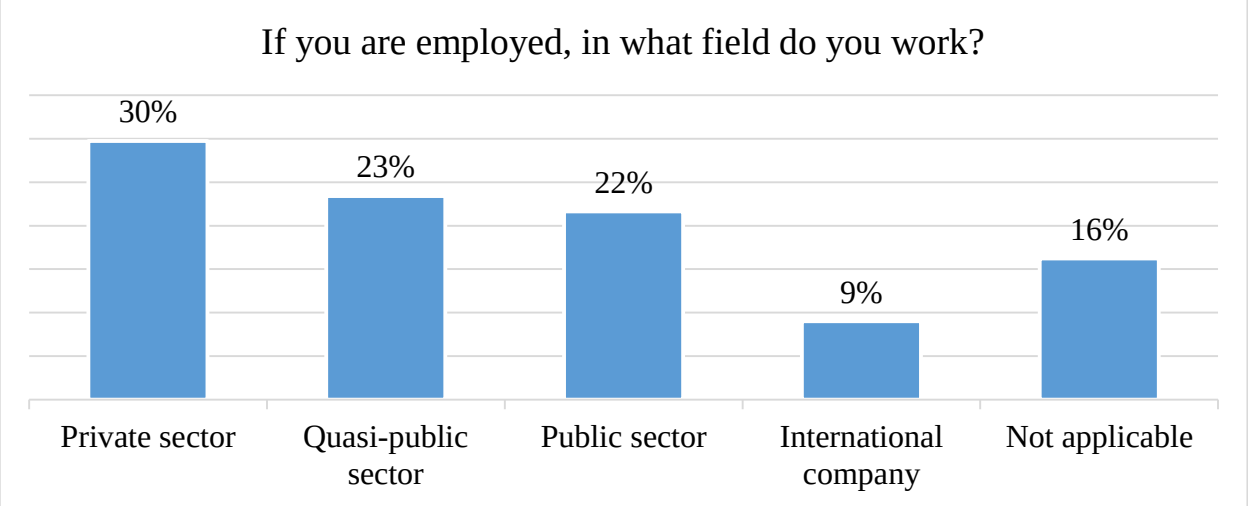
Question 5



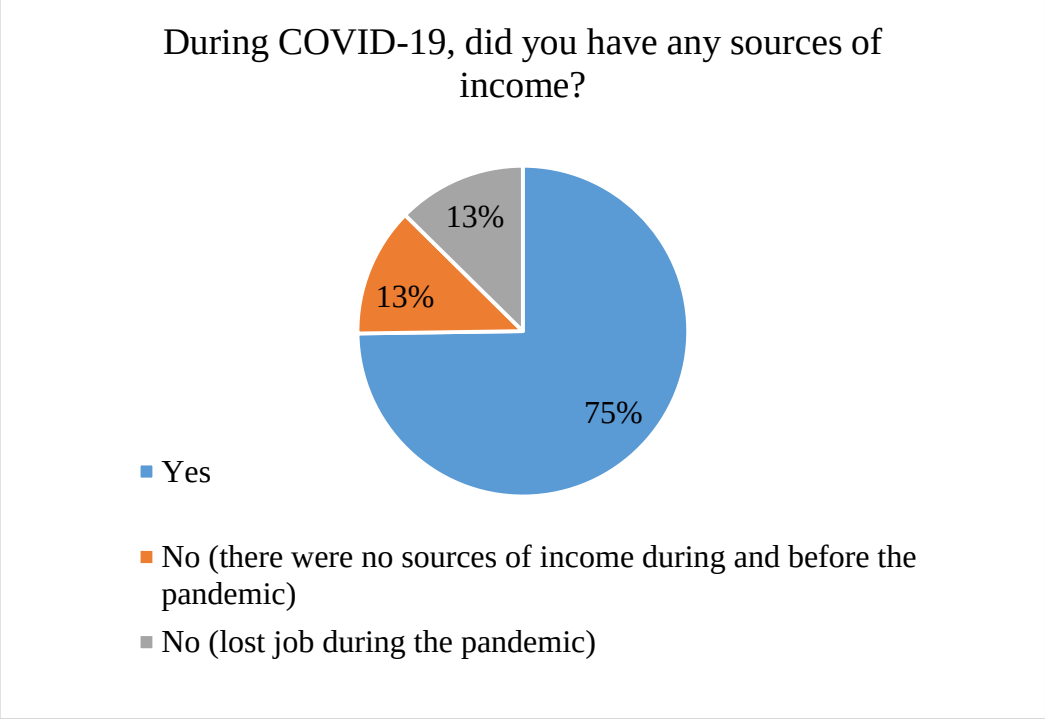
Question 6



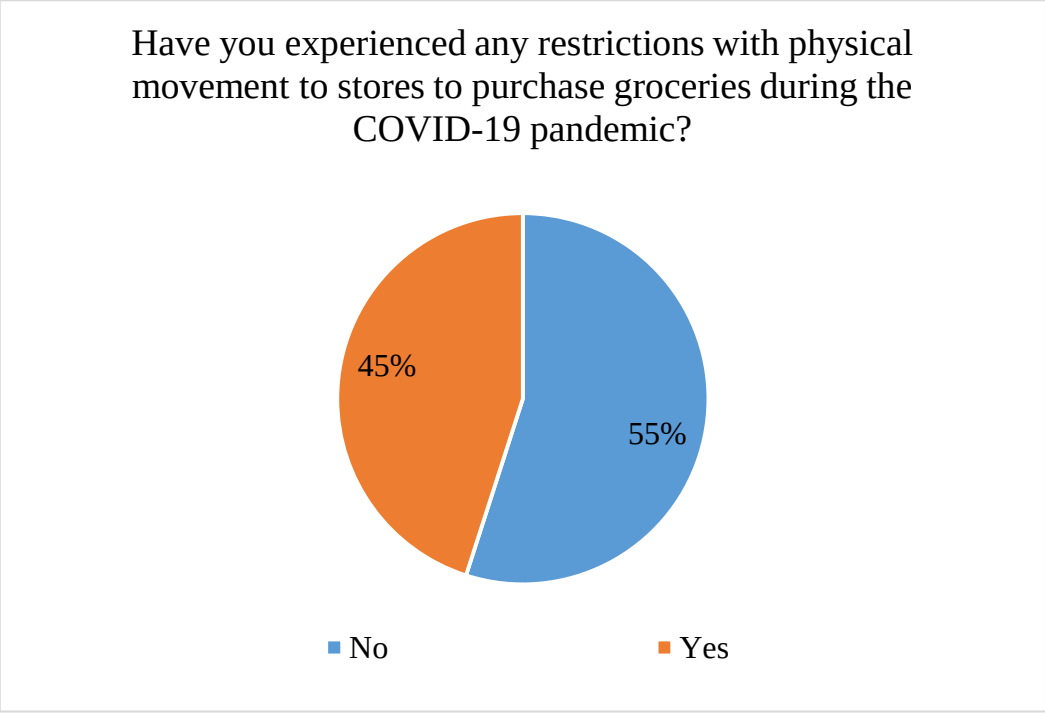
Question 7



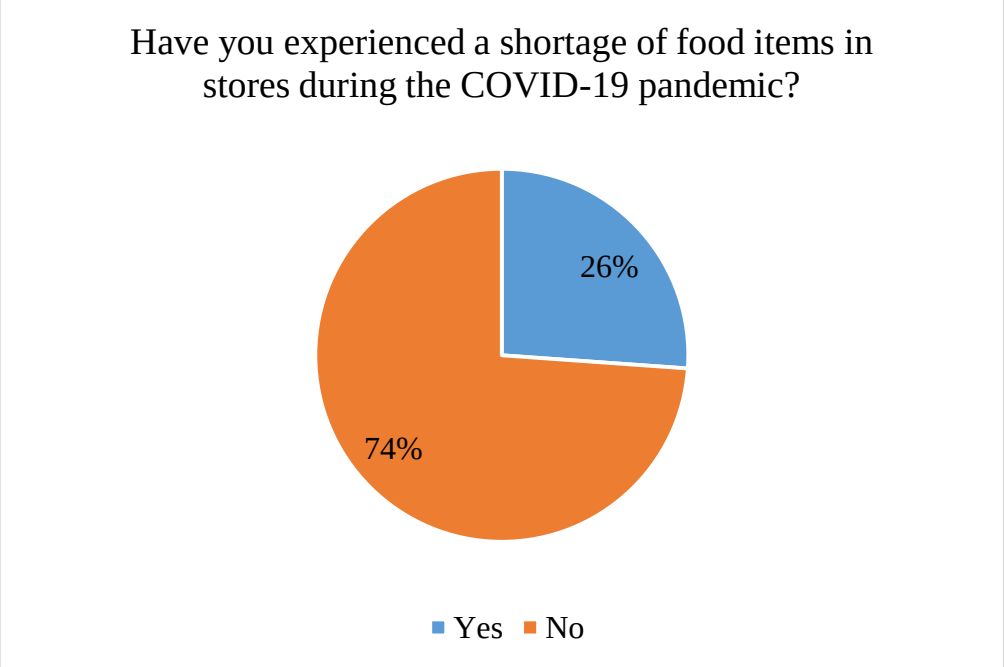
Question 8



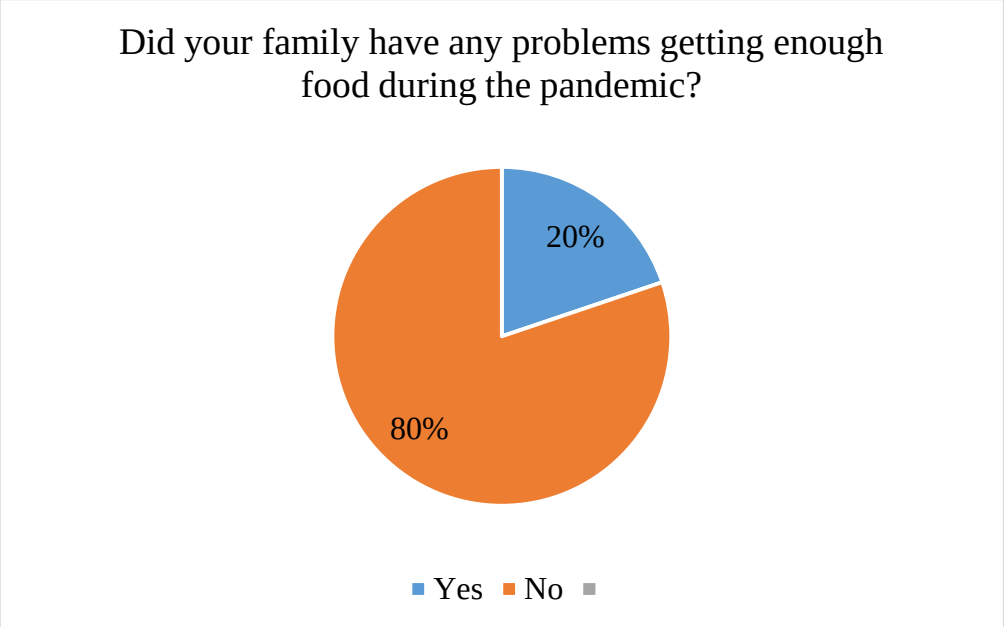
Question 9



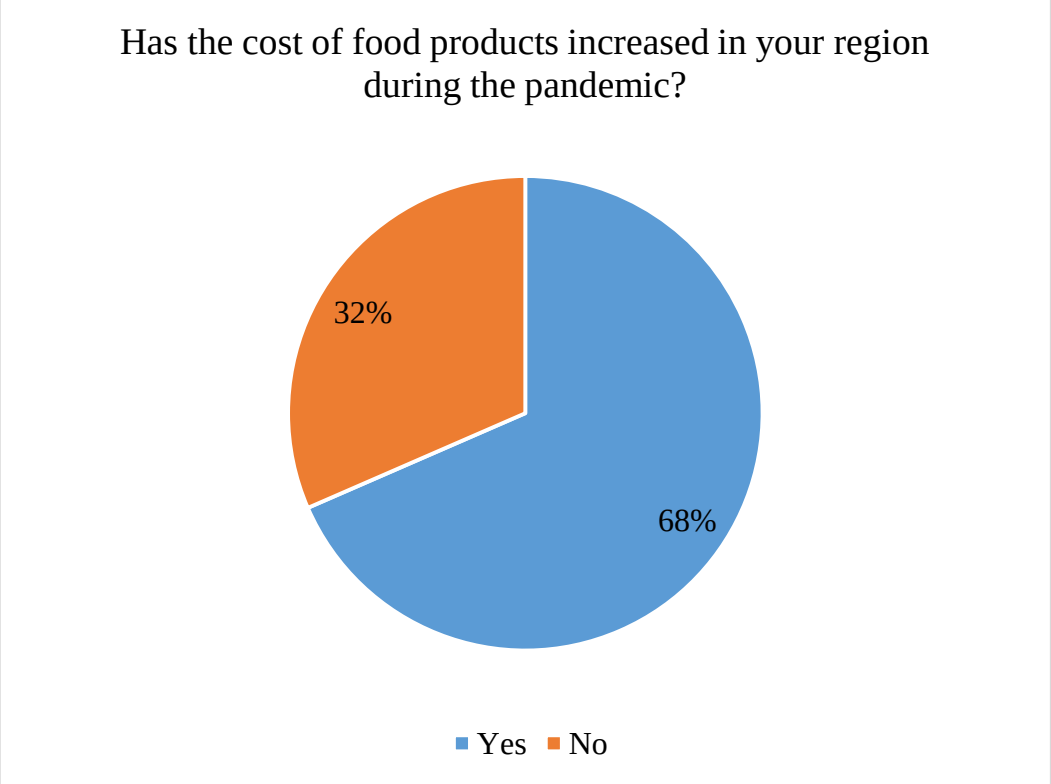
Question 10



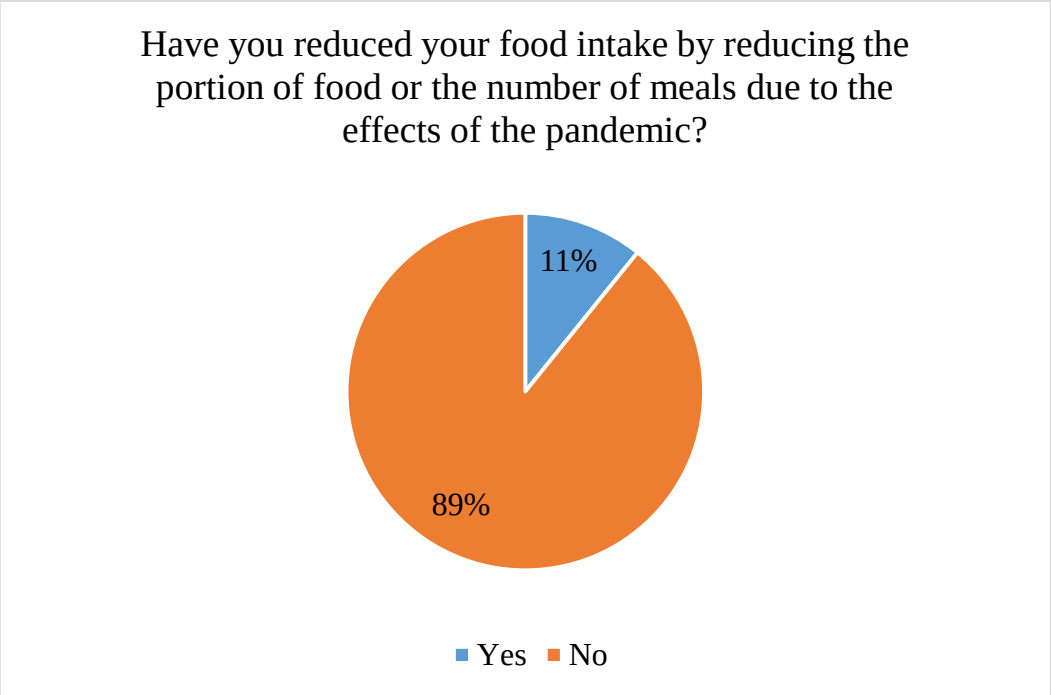
Question 11



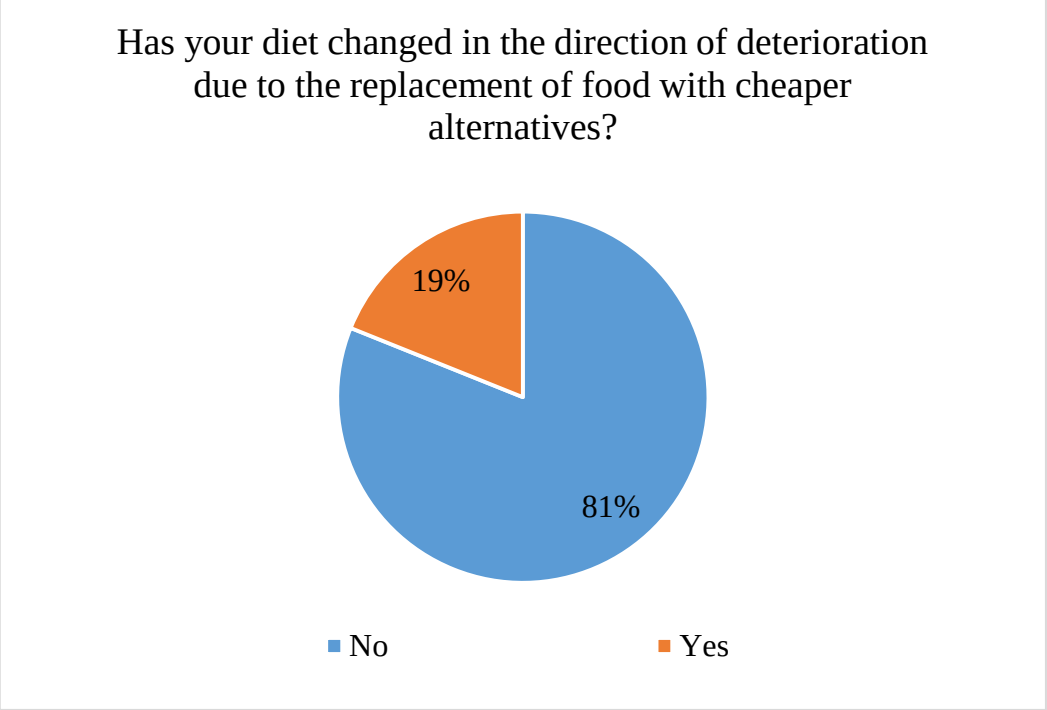
Question 12



Question 13



Question 14



Question 15

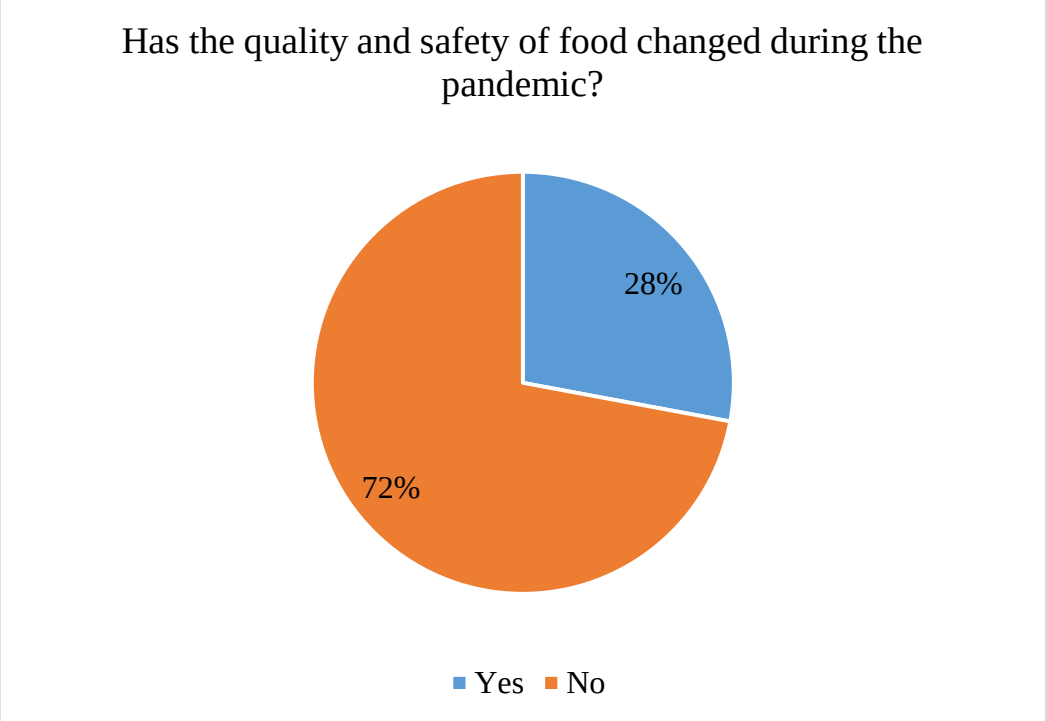


Table 10. Types of subsidies for each year (Republican budgets of RoK)

Subsidies for 2019	1) reimbursement of part of the expenses incurred by the subject of the agro-industrial complex when making investments; 2) subsidizing within the framework of guaranteeing and insuring loans of subjects of the agro-industrial complex; 3) subsidizing the interest rate on credit and leasing obligations as part of the direction of financial rehabilitation of subjects of the agro-industrial complex; 4) subsidizing interest rates for lending, as well as leasing for the purchase of farm animals, machinery and technological equipment; 5) subsidizing procurement organizations in the agro-industrial complex of the amount of value added tax paid to the budget, within the limits of the calculated value added tax.
Subsidies for 2020	1) reimbursement of part of the expenses incurred by the subject of the agro-industrial complex when making investments; 2) subsidizing within the framework of guaranteeing and insuring loans of subjects of the agro-industrial complex; 3) subsidizing the interest rate on credit and leasing obligations as part of the direction of financial rehabilitation of subjects of the agro-industrial complex; 4) subsidizing interest rates for lending, as well as leasing for the purchase of farm animals, machinery and technological equipment; 5) subsidizing procurement organizations in the agro-industrial complex of the amount of value added tax paid to the budget, within the limits of the calculated value added tax; 6) subsidizing coupon payments on bonds; 7) subsidizing the development of livestock breeding, increasing the productivity and quality of livestock products; 8) subsidizing the cost of pesticides, bioagents (entomophages) intended for treatment against harmful and especially dangerous pests with numbers above the economic threshold of harmfulness and quarantine objects; 9) subsidizing the development of seed production; 10) compensation to individuals and legal entities for the costs of planting and growing destroyed fruit and berry crops infected with fire blight; 11) subsidizing the production of priority crops; 12) subsidizing the cost of fertilizers (except for organic ones).
Subsidies for 2021	1) reimbursement of part of the expenses incurred by the subject of the agro-industrial complex when making investments; 2) subsidies within the framework of guaranteeing and insuring loans of subjects of the agro-industrial complex; 3) subsidizing the interest rate on credit and leasing obligations as part of the direction of financial rehabilitation of subjects of the agro-industrial complex; 4) subsidizing interest rates for lending, as well as leasing for the purchase of farm animals, machinery and technological equipment; 5) subsidizing coupon payments on bonds; 6) subsidizing the cost of pesticides, bioagents (entomophages) intended for treatment against harmful and especially dangerous pests with numbers above the economic threshold of harmfulness and quarantine objects; 7) subsidizing the development of seed production; 8) compensation to individuals and legal entities for the costs of planting and growing destroyed fruit and berry crops infected with fire blight; 9) subsidizing the cost of fertilizers (except for organic ones).

Subsidies for 2022	1) subsidizing the development of livestock breeding, increasing the productivity and quality of livestock products; 2) reimbursement of part of the expenses incurred by the fishery entity during investment investments; 3) reimbursement of part of the expenses incurred by the subject of the agro-industrial complex when making investments; 4) subsidies within the framework of guaranteeing and insuring loans of subjects of the agro-industrial complex; 5) subsidizing the interest rate on credit and leasing obligations as part of the direction of financial rehabilitation of subjects of the agro-industrial complex; 6) subsidizing interest rates for lending, as well as leasing for the purchase of farm animals, machinery and technological equipment; 7) subsidizing the cost of pesticides, bioagents (entomophages) intended for treatment against harmful and especially dangerous pests with numbers above the economic threshold of harmfulness and quarantine objects; 8) compensation to individuals and legal entities for the costs of planting and growing destroyed fruit and berry crops infected with fire blight; 9) subsidizing the reimbursement of expenses incurred by a national company in the agricultural sector when selling food grains for regulatory impact on the domestic market; 10) subsidizing the cost of fertilizers (except for organic ones); 11) subsidizing the development of production of priority crops.
Subsidies for 2023	1) subsidizing the costs of processing enterprises for the purchase of agricultural products for the production of highly processed products; 2) subsidizing the reimbursement of expenses incurred by a national company in the agro-industrial complex when selling food grains for regulatory impact on the domestic market.