ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
ECONOMIC STUDIES

Volume 32(5), 2023

Zhanar Yeszhanova[1]
Nazym Zaitenova[2]

FOOD SECURITY OF THE REPUBLIC OF KAZAKHSTAN: ASSESSMENT OF PUBLIC SATISFACTION WITH LOCALLY PRODUCED FOOD[3]

This study assessed the quality and safety, physical and economic availability of Kazakhstani food products in the regional market. The aim of the research is to assess the satisfaction of the local population with the availability, affordability, quality and safety of food products produced in Kazakhstan. The empirical data of 297 people who participated in the survey were analyzed using Partial Least Squares Structural Equation Modelling. The results of the study confirm the positive relationship between the presence of Kazakhstan-made food products on the market and the degree of public satisfaction with their diet, a positive relationship between the affordability of Kazakhstan-made food and the degree of public satisfaction with their diet, as well as proved the existence of a direct relationship between the quality and safety of food products made in Kazakhstan and the degree of public satisfaction with their diet. In addition, an analysis of official statistical data on the volume of production and imports of food products was carried out, which made it possible to make a more detailed analysis of the degree of provision of the country's population with basic foodstuffs.
Keywords: food security; food quality; food safety; availability; affordability; Kazakhstan
JEL: F00; Q10; Q18

1. Introduction

The issue of food security is one of the main conditions for ensuring the national security of the country. Given the tense geopolitical situation in neighbouring countries, self-sufficiency in basic food is the foundation of food security in the Republic of Kazakhstan. The authors consider the level of satisfaction of the population of the region with their nutrition, focusing on the relationship between the satisfaction of the population with their nutrition and the physical and economic accessibility, quality and safety of Kazakhstani food products. The article focuses on the problem of food security in Kazakhstan in terms of food independence

[1] *Zhanar Yeszhanova, Assoc.Prof., candidate of economic sciences, Kenzhegali Sagadiyev University of International Business, +7 778 978 52 00, e-mail: eszhan78@mail.ru.*
[2] *Nazym Zaitenova, Assoc.Prof., PhD, Kenzhegali Sagadiyev University of International Business, +7 775 953 23 45, e-mail: fc.head@uib.kz.*
[3] This paper should be cited as: *Yeszhanova, Z., Zaitenova, N. (2023). Food Security of the Republic of Kazakhstan: Assessment of Public Satisfaction with Locally Produced Food. – Economic Studies (Ikonomicheski Izsledvania), 32(5), pp. 16-31.*

from imports and the degree of satisfaction of the population with locally produced food. Thus, in the article, the authors consider several problems: the level of self-sufficiency of the country in basic food products, the degree of satisfaction of the population with their availability in the market, affordability, quality and safety of locally produced food.

For a more in-depth analysis of the level of food independence of the country from the position of sufficiency and availability, safety and quality, the authors conducted a survey of the population (297 people). The first block included questions concerning the degree of respondents' satisfaction with their diet (DS) according to the following points: caloric content, variety of menu, quality and safety of consumed products. The second block of questions is directed to the analysis of physical availability (FAV), i.e. sufficiency in the market of foodstuff of Kazakhstani production by the volume of supply and assortment. The third block of questions reveals the level of economic affordability of food products produced in Kazakhstan (FAF), including such items as the share of expenditures on food products in total expenditures, consumer preferences in the price ratio of products of Kazakhstani production and imported origin. The fourth block is aimed at assessing the degree of respondents' satisfaction with the quality and safety of Kazakhstan-made products (FQ), and consumers' preferences for quality of Kazakhstan-made and imported goods.

In addition to the data from the survey, the authors, based on official statistical data of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National Statistics analyze the level of Kazakhstan's dependence on imports of basic food products, the level of self-sufficiency.

2. Literature Review

Since the beginning of the study of the problem and the formation of the theory of food security, there have been many studies on the formulation of the essence of food security (Cook, 2002; Gross, 2000).

The term “food security” has been used over time to mean different things (Pinstrup-Andersen, 2009). The widely accepted definition of food security was formulated in the annual report on food security of the Food and Agriculture Organization (FAO) “The State of Food Insecurity in the World 2001”: Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for active and healthy life (FAO, The state of food insecurity in the world 2001, 2001). The last revision to this definition happened at the 2009 World Summit on Food Security which added a fourth dimension – stability – as the short-term time indicator of the ability of food systems to withstand shocks, whether natural or man-made (FAO, Declaration of the World Food Summit on Food Security, 2009).

Food security is achieved, if adequate food (quantity, quality, safety, socio-cultural acceptability) is available and accessible for and satisfactorily utilized by all individuals at all times to live a healthy and happy life (Gross, 2000).

Many works are devoted to the measurement and evaluation of food security (Barrett, 2010; Zou, 2015; Shi, 2022), where different indicators are proposed for evaluation, in the following areas: quantity security, economic security, quality security, and resource security.

To explain changes in the level of food security, to predict its future state, scientists analyze the factors affecting it: geopolitical factors (Nabuuma, 2021), pandemic Covid 19 (Béné, 2020; Arndt, 2020; Yeszhanova, 2021).

The active search for different ways to improve the efficiency of the agro-industrial complex and to ensure food security began in the early twentieth century.

The problem of growing demand for food is the most important social problem (Bond, 2013).

The imbalance between the growth rate of the world's population and food production, due to limited land and water resources, is at the root of growing concerns about food security around the world (Irani, 2016).

What all scientists have in common is the fear that the population may someday exceed the world's food supply. The main threats to food security are physical inaccessibility (lack of availability on the market) of food, economic inaccessibility of food (insufficient purchasing power) (Khanna, 2020; Ahmed, 2020), uneven, irrational distribution of food products (Anghinoni, 2021). Poverty (Jenderedjian, Bellows, 2021), natural disasters (Chen, et al., 2021; Pakravan-Charvadeh, et al., 2021), geopolitical factors are causes of disproportionate food distribution worldwide (Nabuuma, 2021).

Recently, scientists have been exploring the concept of food security from the perspective of dietary diversity and the satisfaction of the population with their diets (James, 2018) (Salahodjaev R., 2021)**,** (Murray, 2021).

Figure 1. Word cloud

Source: obtained by authors when processing literature review data in the NVivo program.

Food security and food insecurity are dynamic, reciprocal and time dependent and the resultant status depends on the interaction between the stresses of food insecurity and the coping strategies to deal with them. Universal indicators for measuring food security are challenging. Different indicators may be applied to different levels of food security. Measuring food security at the household level involves five categories of indicators dietary diversity and food frequency, spending on food, consumption behaviours, experiential indicators and self-assessment measurements (Peng, 2019). Since the article focuses on the assessment of independence from food imports, let us turn to the concept of food independence.

Food independence is internal self-sufficiency in food, in the amounts necessary for the population within the country, independent of imports of finished products, raw materials, equipment and other elements of the production process chain. In other words, it is the ability of the state, at the expense of domestic production, to produce such an amount of food that is necessary to ensure the domestic market.

Food independence is often confused with food security. But food independence is a tool for achieving food security. The definition of food independence itself allows for a clearer definition of food security. Food independence is measured by the ratio of what is produced and what is consumed by the local population in a certain territorial unit (country, region, subject, state, province, etc.). If as much is produced as is consumed, or more, it can be called food independence (Tyutyunik, 2016).

According to the resolution of the Inter-parliamentary Assembly of the Eurasian Economic Community, food sovereignty is a prerequisite for ensuring the country's food security, so that a food crisis does not arise if food supplies from abroad are cut off.

According to the offer of FAO, food independence is reached through the production of vital products at the level of not less than 80% of the requirement of the population (Prosekov, 2016)**.**

Food security comprises food independence and insurance of the availability of the food for population. The role of the national agrarian policy in providing the population with domestic food (Altukhov A. I., 2015)**.**

In the conditions of the globalization of national economies, the current situation in macroeconomics and, as a result, the need to improve the quality of life of the population, it is necessary to clearly outline and resolve the following three strategic tasks of the country's agro-food industry: ensuring the country's foodstuff independence based on import substitution; raising the competitiveness of farm products; developing the high-level standard of living at the rural area based on the socio-economic development of the territories (Altukhov Đ. .., 2016)**.**

Transparency and understanding of the public's perception of food risks is a necessary first step in establishing the urgently required public dialogue about the complex value questions involved in food production (Jensen, 2002)**.**

Based on the literature review, the following hypotheses were formulated:

H1 – The physical availability (availability in the market) of food products produced in Kazakhstan has a positive relationship with public satisfaction in their diet.

H2 – Economic accessibility (affordability) of Kazakhstani food products has a positive relationship with public satisfaction with their diet.

H3 – Quality and safety of Kazakhstani food products have a positive relationship with public satisfaction with their diet.

All these correlations are presented in Figure 2.

3. Research Methods

3.1 Data collection

To test the hypotheses proposed by the authors, a survey of the population in Google Tables was conducted. For the selection of respondents of this research, the method of non-repeat sampling was used, the individual type of sampling was used, according to the method of selection the combined sampling was chosen, based on the combination of several sampling methods: simple random sampling and typical (stratified) sampling. The latter involves dividing a heterogeneous general population into typological groups by some essential characteristic, and then randomly selecting units from each group.

People of different ages and different places of residence took part in the survey: both urban and rural, with different levels of education and different levels of income and places of work. For the survey, a questionnaire was developed in Russian, Kazakh, and English, based on scales used by modern researchers with higher reliability (Ferris, 2008); (Zheng Qiupeng, 2016); (Felfe, 2002); (Hinkin, 2008). A five-point Likert scale was used to measure the level of agreement (satisfaction) and disagreement (dissatisfaction), where from 1 = strongly disagree (not satisfied) to 5 = strongly agree (completely satisfied).

3.2 Methods

The questionnaire consisted of two parts. The first part is focused on collecting general information about the respondents: data on age and gender, place of residence (urban, rural), income level and place of work. The second part consisted of 12 items to measure four components: satisfaction with one's diet, respondents' opinions about the physical availability of food produced in Kazakhstan, the economic availability of food produced in Kazakhstan and the quality and safety of food produced in Kazakhstan.

The authors evaluated the Cronbach's alpha, a tool that shows the internal consistency of characteristics that describe one object, but is not an indicator of the homogeneity of an object. The results show that Cronbach's alpha values for all elements are higher than the allowed value of 0.7 and are presented in Table 2 below.

Common Method Variance (CMV)

While several subjective measures have been taken, the author also analyzed Herman's univariate test to address CMV problems.

The collected data were analyzed using the Partial Least Squares Structural Equation Method (PLS-SEM) in Smart-PLS 4.0 software.

In order to study the level of food independence of the Republic of Kazakhstan on the basis of official statistics, methods of comparison and a graphical method were applied.

4. Results and Data Analysis

The sample size was 297 respondents of the population of Kazakhstan of different ages. Among the respondents, 139 (46.8%) are men and 158 (53.2%) are women. Among those interviewed, 52 people (17.5%) were between the ages of 18 and 24; 117 (39.4%) were aged 25 to 40; and 128 (43.1%) were over 40 years of age from 18 to 24 years old; 117 (39.4%) aged 25 to 40; and 128 (43.1%) were over 40 years of age.

For data analysis, the author applied the partial least squares equation (PLS-SEM) method using the Smart-PLS 4.0 software. Modern researchers (Hair, 2012) advocate the use of this method for quantitative data analysis. This study explores the properties of a measurement model with SEM-PLS by evaluating convergent validity, discriminant validity, and intrinsic robustness of constructs, as well as variable robustness.

Analysis of the measurement model

Indicator reliability: the indicator's outer loadings should be higher than 0.70. Indicators with outer loadings between 0.40 and 0.70 should be considered for removal only if the deletion leads to an increase in composite reliability and AVE above the suggested threshold value. In our model, all meanings of outer loadings are higher than 0.70 (Table 1). So we can prove the reliability of our indicators.

Table 1. Outer loadings

A1 <- Dietary satisfaction	0.799
A2 <- Dietary satisfaction	0.826
A3 <- Dietary satisfaction	0.852
B1 <- Food availability	0.862
B2 <- Food availability	0.896
B3 <- Food availability	0.829
C1 <- Food affordability	0.794
C2 <- Food affordability	0.866
C3 <- Food affordability	0.828
D1 <- Food quality	0.792
D2 <- Food quality	0.857
D3 <- Food quality	0.816

Source: Authors' calculations based on survey data.

Researchers (Hair et al, 2014) advised to consider indicators such as Cronbach's alpha, extracted mean-variance (AVE), as well as composite reliability (CR) values, which are valid for assessing convergent validity (CV). CV evaluates whether the elements are related to the construct or otherwise. Initially, we estimated loadings of indicators where values above 0.7 were retained and elements with lower values were removed, as suggested by modern researchers. (Kashif, 2017). These investigators also suggested that Cronbach's alpha should be above the 0.7 cut-off level used in the analysis of this study. Cronbach's alpha values of DS (0.767), FAF (0.775), FAV (0.828), FQ (0.759) exceeded minimum standards to demonstrate internal consistency, leading us to further measurements and evaluation. CR values should be above 0.7 and AVE should be above 0.5 as suggested by quantitative researchers (Hair et al., 2014). All these values are presented in Table 2.

Table 2. Construct reliability and validity

	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Dietary satisfaction DS	0.767	0.768	0.866	0.682
Food availability FAV	0.775	0.781	0.869	0.689
Food affordability FAF	0.828	0.830	0.897	0.745
Food quality FQ	0.759	0.759	0.862	0.676

Source: Authors' calculations based on survey data.

Structural model

The next step in the procedure was a discriminant validity (DV) assessment to understand the extent to which the constructs differed from each other. The discriminant validity of our analysis by the ForneLL-Larcker test is guaranteed because the AVE square root values are higher than the correlation values. Based on the results, it can be noted that all factor signs correlate with the level of satisfaction of the population with their diet. The results are presented in Table 3.

Table 3. Discriminant validity – ForneLL-Larcker criterion

	Dietary satisfaction	Food affordability	Food availability	Food quality
Dietary satisfaction	0.826			
Food availability FAV	0.662	0.830		
Food affordability FAF	0.642	0.718	0.863	
Food quality	0.646	0.747	0.701	0.822

Source: Authors' calculations based on survey data.

According to Gefen and Straub (Gefen, 2005), discriminant validity occurs when each element of the dimension is weakly correlated with another construct, except for those with which it is theoretically associated."

In cross-loading, the researcher examines different elements to identify those that have a high load on the same structure and those that heavily load multiple structures. Thus, establishing discriminant validity at the element level means that there is a high correlation between elements of the same construct and a very weak correlation between elements of another

construct. Due to the simplicity of this method, it has no theoretical justification or empirical evidence. (Henseler, 2016). In the table below, elements shaded in green represent factor loads for each structure, and cross loads (not highlighted) for the same structure. You can see in Table 4 that the factor-loading values are significantly larger than the cross-loading values, indicating good discriminant validity.

Table 4. Discriminant validity – Cross loadings

Indicators	Dietary satisfaction	Food availability	Food affordability	Food quality
A1	0.799	0.582	0.491	0.536
A2	0.826	0.523	0.506	0.532
A3	0.852	0.535	0.590	0.533
B1	0.579	0.579	0.862	0.594
B2	0.551	0.636	0.896	0.630
B3	0.529	0.646	0.829	0.589
C1	0.486	0.794	0.597	0.547
C2	0.560	0.866	0.615	0.599
C3	0.594	0.828	0.579	0.701
D1	0.534	0.613	0.504	0.792
D2	0.515	0.623	0.592	0.857
D3	0.543	0.605	0.629	0.816

Source: Authors' calculations based on survey data.

The next step is to analyze the conformity of the constructed model.

R Square explains the variance in Dietary satisfaction explained by the exogenous variable(s): food availability (FAV), food affordability (FAF) and food quality (FQ). R-Square value of 0.519. This would mean that a 51,9% change in Dietary satisfaction can be explained by FAV, FAF and FQ.

The results of the analysis for the fit of the model are presented in Table 5. The saturated model assesses the correlation between all constructs. The estimated model is a model which is based on a total effect scheme and takes the model structure into account. It is hence a more restricted version of the fit measure.

The SRMR is defined as the difference between the observed correlation and the model-implied correlation matrix. Thus, it allows assessing the average magnitude of the discrepancies between observed and expected correlations as an absolute measure of the (model) fit criterion.

A value less than 0.10 or 0.08 (in a more conservative version; (Hu, 1999)) is considered a good fit. Henseler et al. (2014) introduce the SRMR as a goodness-of-fit measure for PLS-SEM that can be used to avoid model misspecification. In our analysis, SRMR (see Table 4) is equal to 0.072, that less than 0.08

As defined by Dijkstra and Henseler (Dijkstra, 2015), d_ULS (i.e., the squared Euclidean distance) and d_G (i.e., the geodesic distance) represent two different ways to compute this discrepancy. The bootstrap routine provides the confidence intervals of these discrepancy values. The d_G criterion builds on PLS-SEM eigenvalue computations. However, the question remains about how these eigenvalues differ from CB-SEM.

For the exact fit criteria (i.e., d_ULS and d_G), you compare their original value against the confidence interval created from the sampling distribution. The confidence interval should include the original value. Hence, the upper bound of the confidence interval should be larger than the original value of the exact d_ULS and d_G fit criteria to indicate that the model has a "good fit". Choose the confidence interval in a way that the upper bound is at the 95% or 99% point.

In other words, a model fits well if the difference between the correlation matrix implied by your model and the empirical correlation matrix is so small that it can be purely attributed to sampling error. Hence, the difference between the correlation matrix implied by your model and the empirical correlation matrix should be non-significant ($p > 0.05$). Otherwise, if the discrepancy is significant ($p < 0.05$), the model fit has not been established.

Assuming a multinormal distribution, the Chi^2 value of a PLS path model with degrees of freedom approximately is (N-1)*L, whereby N is the number of observations and L is the maximum likelihood function as defined by Lohmöller (Lohmöller, 1989). The degrees of freedom (df) are defined as $(K^2 + K) /2 – t$, whereby is the number of manifest variables in the PLS path model and *t* is the number of independent variables to estimate the model implied covariance matrix.

One of the first fit measures proposed in the SEM literature is the normed fit index by Bentler and Bonett (1980). It computes the Chi^2 value of the proposed model and compares it against a meaningful benchmark. Since the Chi^2 value of the proposed model in itself does not provide sufficient information to judge model fit, the NFI uses the Chi^2 value from the null model, as a yardstick.

The NFI is then defined as 1 minus the Chi^2 value of the proposed model divided by the Chi^2 values of the null model. Consequently, the NFI results in values between 0 and 1. The closer the NFI is to 1, the better the fit. NFI values above 0.9 usually represent an acceptable fit. In our case, NFI is equal to 0.785.

Table 5. Model fit

	Saturated model	Estimated model
SRMR	0.072	0.072
d_ULS	0.405	0.405
d_G	0.235	0.235
Chi-square	403.980	403.980
NFI	0.785	0.785

Source: Authors' calculations based on survey data.

The next step is to analyze the data to test the three hypotheses proposed for this study, presented in Table 6 below. We investigated the direct impact of the main constructs: physical and economic accessibility, quality and safety of food products produced in Kazakhstan on the degree of satisfaction of the population with their diet.

The results of the analysis in Table 6 show that the physical availability of food products produced in Kazakhstan (ß = 0.29, p = 0.001), the economic availability of food products produced in Kazakhstan (ß = 0.263, p = 0.001) and the quality and safety of food products

produced in Kazakhstan (ß = 0.245, p = 0.001) are positively related to the degree of satisfaction of the population with their diet. Therefore, the hypotheses H1, H2, H3 formulated at the beginning of the study are accepted.

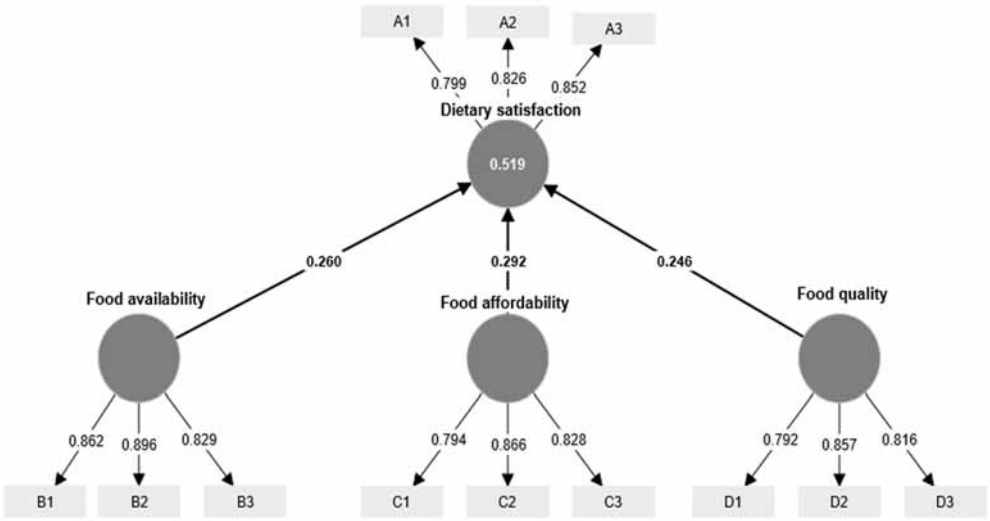
Table 6. Testing the Path Model

	Beta value	Standard deviation	T statistics	P values
Food availability -> Dietary satisfaction	0.290	0.086	3.385	0.001
Food affordability -> Dietary satisfaction	0.263	0.081	3.221	0.001
Food quality -> Dietary satisfaction	0.245	0.072	3.403	0.001

Source: Authors' calculations based on survey data.

Thus, we can conclude that the constructed model is adequate and reliable (Figure 2).

Figure 2. Path model



Source: Authors' calculations based on survey data.

5. Discussion

The results obtained as a result of modelling the presence of a positive relationship between the satisfaction of the population with local food products are comparable with official statistical data characterizing the physical and economic accessibility of food products in the country. Data provided by the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

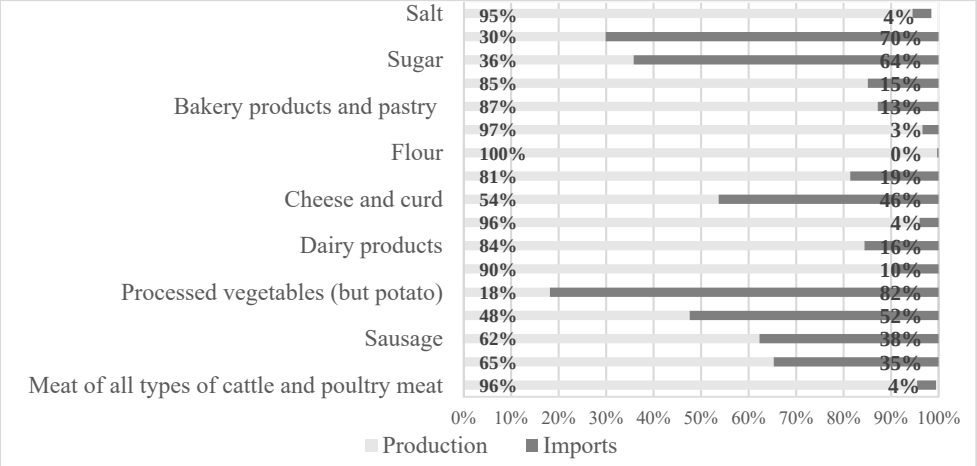
Food availability

According to the results of January 2022, Kazakhstani companies managed to provide the flour market with local products at a fairly high level (99.7% of demand is covered by domestic production), fresh eggs (97.2%), cereals and rice (96.6%), red meat and poultry (95.5%), vegetable oils (88.8%), as well as pasta, noodles and other similar flour products (85.1%).

As for the segment of dairy products (except for fresh milk), here, in general, the level of self-sufficiency for the entire product line is 84.4%. However, for certain product groups, the dependence is higher. Thus, local companies cover the demand for butter by only 67.9%, and for cheese and cottage cheese – by 53.7%.

As can be seen from the data in Figure 3, the Republic of Kazakhstan has a high level of dependence on imports of the following goods: tea, coffee (70% is imported), sugar (64%), cheese and cottage cheese (46%), processed vegetables (except potatoes) (82 %), fish (52%), sausages (38%), canned meat (35%).

Figure 3. Share of domestically produced and imported food products in Kazakhstan in 2022



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

As can be seen from the above data, Kazakhstan's dependence is observed mainly in processed food, which indicates a weak position in the country's food industry, the need to open new and increase existing capacities of the manufacturing industry in such areas as sugar, meat, fish, dairy, industry processing fruits and vegetables. The speedy implementation of this issue will largely solve the threat to Kazakhstan's food security from the position of dependence on imports for basic food products.

Food affordability

A complex geopolitical situation has hit the Kazakhstanis in the pocket. In March 2022, Kazakhstan faced a staple food price surge. Amid the unrest in the middle of the month, people were panic buying sugar, cereals and flour. Supplies to stores from warehouses were on schedule, but they were bought so quickly that shelves with such goods were empty most of the time.

According to express information from the Bureau of National Statistics of Kazakhstan, socially significant food products in the republic went up by 11.4 per cent from January and by 9.1 per cent from early March. In the early spring of 2020 and 2019, there were no such surges, which proves the presence of exceptional growth factors.

Statisticians use three time spans to analyse prices: short-term (for one month), mid-term (from the beginning of the year) and long-term (in the last 12 months). The first two options not only prove the rise in commodity prices, but also show the results of panic buying and deficit. The annual rate, as the 'total' in pricing math, shows the real objective changes.

Thus, in the short run, prices of all 19 socially significant products (the list of commodities is approved by the government of Kazakhstan – author's note) went up in March. The minimum price rise was for sunflower oil (3 per cent), meat (2.6 per cent), flour (3.4 per cent) and bread (3.4 per cent). Cereal prices went up by 5-7 per cent on average, milk and chicken – by 6-7 per cent, potato and carrot – by 15 per cent. The biggest price jump was for sugar (35 per cent), onion (32 per cent) and cabbage (50 per cent).

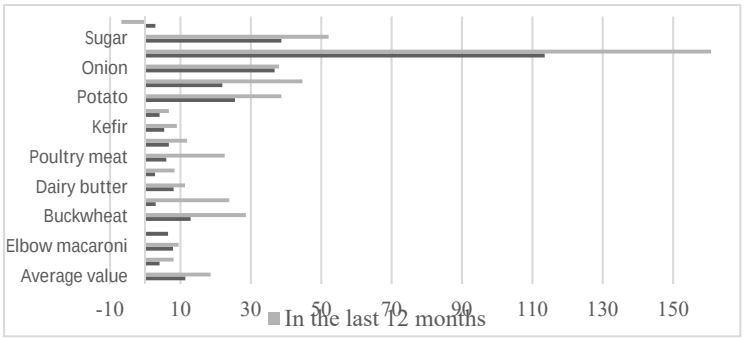
Looking at the annual figures, the mean growth value will be 18.6 per cent. From March 2021, flour, bread, macaroni, dairy butter and kefir prices went up 10 per cent in Kazakhstan. Such commodities as buckwheat, potato, onion and poultry meat went up by 30-40 per cent. The products with skyrocketed prices are sugar (52 per cent) and cabbage (187 per cent).

While the modelling results generally showed a positive relationship between the degree of satisfaction of the population with their diet and food availability, affordability, quality and safety of local food products, the presented statistical data indicate that for a number of commodity items, there is a deficit of domestic production.

In addition, in 2022 there is a significant increase in prices for almost all commodity items, which exacerbates the problem of affordability of food in the market of the country.

Thus, empirical data indicate the presence of the main threats to the country's food security as a significant lack (less than 65%) of domestic production of such products as sugar, tea, coffee, cheese, cottage cheese, processed vegetables, fish, sausages and canned meat. In addition, in 2022 there is an acute problem of economic affordability of food, which is associated with rising prices caused by shortages and disruptions in the supply chain of goods due to the tense geopolitical situation.

Figure 4. Increase in food prices in Kazakhstan



Source: Authors' calculations based on data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

Government measures, taken to ensure food security

According to the Decree of the Government of the Republic of Kazakhstan dated March 31, 2022 No. 178 on the approval of the Food Security Plan of the Republic of Kazakhstan for 2022-2024, a number of comprehensive measures have been taken.

"The plan consists of three main sections with 31 measures, including 18 measures to ensure physical accessibility, 6 measures to ensure economic security and 7 measures to ensure the safety and quality of products.

The first section is aimed at implementing measures to increase agricultural production and includes 18 measures, of which 1 operational and 17 medium-term.

In three years, crop production will be diversified by increasing oilseeds area from 3m to 3.5m ha, potatoes from 200,000 to 215,000 ha, and fodder crops from 3.6m to 4.2m ha. Also within three years, the number of cattle will be increased to 9 million heads, cattle to 20.1 million heads, horses to 4 million heads and so on.

Realization of investment projects on storage of potatoes, vegetables and fruits will allow increasing in storage capacities in 2022 by 98,3 thousand tons, in 2023 – 104,5 thousand tons and in 2024 – 19,6 thousand tons.

In addition, this section provides for measures on the import substitution of food products and monitoring of the actual and forecast balance of production and consumption of agricultural products.

The second section is aimed at the implementation of 5 operational and 1 medium-term measure to reduce the share of consumer spending of the population on food products and price stabilization.

These are measures such as forecasting food prices, reduction of rent by trading markets for sellers of socially important food products, development of measures for the transition from administrative regulation of prices to targeted support of socially vulnerable population

groups, evaluation of the effectiveness of stabilization funds, increasing employment in rural areas by creating at least 25 thousand farms through new forms of involving into a turnover of agricultural land, as well as the development of newly irrigated land.

The third section of the Plan provides for the implementation of four operational and three medium-term measures to provide consumers with safe products. Such as ensuring control over the quality and safety of food products to increase the share of investigated imported products to 80%, modernization of existing and creation of new domestic enterprises for the production of veterinary and biological products to increase the share of domestic veterinary and biological products to 80% in 2024 and others.

The implementation of the Plan will ensure food security is a critical component of national security, increase the level of food security, reduce the costs of the population for food products and provide consumers with safe products.

6. Conclusion

The survey data were analyzed from the standpoint of identifying the relationship between the degree of satisfaction of the population with the diet and the level of physical availability, affordability of nationally produced food products and the quality of domestic products. The study revealed a statistically significant positive relationship between the level of satisfaction with the physical, economic accessibility, quality and safety of locally produced food. However, the analysis of official statistical data characterizing the physical availability of food in the Republic of Kazakhstan indicated insufficient self-sufficiency in such food products as tea, coffee, sugar, vegetables, cheese, cottage cheese, butter, processed vegetables, sausage products and canned meat. Economic affordability of food also has threats due to the dynamics of rising prices of basic food products in Kazakhstan. The rise in food prices in 2022 in the country is significant and sharply exacerbated the problem of reducing the purchasing power of the population. All these factors pose significant threats to food security in Kazakhstan and require further research from a more detailed analysis of the main commodity items. The results of the study, summarized for all commodity items as a whole, gave a picture of public satisfaction with locally produced food products. Therefore, the authors plan to conduct an analysis with a differentiated approach to the level of satisfaction of the population of Kazakhstan with basic food products. This will provide a more realistic picture of the current situation with the level of food independence.

References

Ahmed, E. (2020). Food security in Sudan: a historical analysis of food availability. – Iraqi Journal of agricultural sciences. 51 (1). https://doi.org/10.36103/ijas.v51i1.941.

Altukhov, A. I. (2015). Ensuring food independence of the country is a basis of its food security. – Economics of Agriculture of Russia, 11, pp. 2-12. [online]. Available at: https://agris.fao.org/agris-search/search.do?recordID=RU2016001685 [Accessed 15 August 2022].

Altukhov, D.I. & Drokin, V.V. & Zhuravlyov, D.S. (2016). From the Strategy of Food Independence to the Strategy of Raising the Competitiveness of Agroindustry. – R-Economy, Ural Federal University, Graduate School of Economics and Management, Vol. 2(4), pp. 469-479, DOI: 10.15826/recon.2016.2.4.043.

Anghinoni, G., Anghinoni, F. B. G., Tormena, C. A., Braccini, A. L., de Carvalho Mendes, I., Zancanaro, L., Lal, R. (2021). Conservation agriculture strengthen sustainability of Brazilian grain production and food security. – Land Use Policy, 108, pp. 105591. https://doi.org/10.1016/j.landusepol.2021.105591.

Arndt, C., Davies, R., Gabriel, S., Harris, L., Makrelov, K., Robinson, S., ... & Anderson, L. (2020). Covid-19 lockdowns, income distribution, and food security: An analysis for South Africa. – Global food security, 26, 100410. https://doi.org/10.1016/j.gfs.2020.100410.

Barrett, C.B.(2010) Measuring Food Insecurity. – Science, 327, pp. 825–828. https://www.science.org/doi/10.1126/science.1182768.

Béné, C. (2020). Resilience of local food systems and links to food security–A review of some important concepts in the context of COVID-19 and other shocks. – Food security, 12(4), pp. 805-822. https://doi.org/10.1007/s12571-020-01076-1.

Bond, M., Meacham, T., Bhunnoo, R., & Benton, T. (2013). Food waste within global food systems. Swindon, UK: Global Food Security. http://cradall.org/sites/default/files/food-waste-report_0.pdf.

Chen, L., Chang, J., Wang, Y., Guo, A., Liu, Y., Wang, Q., ... & Xie, Z. (2021). Disclosing the future food security risk of China based on crop production and water scarcity under diverse socioeconomic and climate scenarios. Science of The Total Environment, 790, 148110. https://doi.org/10.1016/j.scitotenv.2021.148110.

Cook, J. T. (2002). Clinical implications of household food security: definitions, monitoring, and policy.- Nutrition in Clinical Care, 5(4), pp.152-167. https://doi.org/10.1046/j.1523-5408.2002.00505.x.

Dijkstra, T. K. (2015). Consistent Partial Least Squares Path Modeling. – MIS Quarterly(39(2)), pp. 297–316. doi:https://www.jstor.org/stable/26628355.

FAO, (2001). The state of food insecurity in the world 2001.https://www.fao.org/3/y1500e/y1500e.pdf.

FAO, (2009). Declaration of the World Food Summit on Food Security. FAO, Rome. https://www.fao.org/3/w3548e/w3548e00.htm.

Felfe, J. a. (2002). The relationship between employees' occupational self-efficacy and perceived transformational leadership-replication and extension of recent results. – Current research in social psychology(7(9)), pp.137-162. https://dro.dur.ac.uk/7639/1/7639.pdf?DDD2+dbr4wd.

Ferris, D. L. (2008). The development and validation of the Workplace Ostracism Scale. – Journal of Applied Psychology(93(6)), pp.1348–1366. doi:https://doi.org/10.1037/a0012743.

Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. – Communications of the Association for Information systems, 16(1), pp. 5. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.321.6197&rep=rep1&type=pdf.

Gross, R., Schoeneberger, H., Pfeifer, H., & Preuss, H. J. (2000). The four dimensions of food and nutrition security: definitions and concepts. -Scn news, 20(20), pp. 20-25. http://fpmu.gov.bd/agridrupal/sites/default/files/Four_Dimension_of_FS_0.pdf.

Hair Jr., J. S. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. – European Business Review(26(2)), pp.106–121. doi:https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F. (2012 г.). Partial least squares: the better approach to structural equation modeling? Long range planning (45(5-6),), pp. 312-319. doi:DOI 10.1007/s11747-011-0261-6.

Henseler, J. H. (2016). Using PLS path modeling in new technology research: updated guidelines. Industrial Management & Data Systems, 116(1), pp. 2-20. doi: https://doi.org/10.1108/IMDS-09-2015-0382.

Hinkin, T. R. (2008). A theoretical and empirical examination of the transactional and non-leadership dimensions of the Multifactor Leadership Questionnaire (MLQ). – The Leadership Quarterly,(19(5)), pp. 501-513. doi:https://doi.org/10.1016/j.leaqua.2008.07.001.

Hu, L. T.-5. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. – Structural equation modeling: a multidisciplinary journal(6(1)), pp. 1-55. doi: https://doi.org/10.1080/10705519909540118.

Irani, Z., & Sharif, A. M. (2016). Sustainable food security futures: perspectives on food waste and information across the food supply chain. – Journal of Enterprise Information Management. https://www.emerald.com/insight/content/doi/10.1108/JEIM-12-2015-0117/full/html.

James, B. L. (2018). Validation of the diet satisfaction questionnaire: a new measure of satisfaction with diets for weight management. – Obesity Science & Practice, pp.506-514. https://doi.org/10.1002/osp4.299.

Jenderedjian, A., & Bellows, A. C. (2021). Rural poverty, violence, and power: Rejecting and endorsing gender mainstreaming by food security NGOs in Armenia and Georgia. – World Development, 140, pp. 105270. https://doi.org/10.1016/j.worlddev.2020.105270.

Jensen, K. S. (2002). Food Safety and Ethics: The Interplay between Science and Values. – Journal of Agricultural and Environmental Ethics, pp. 245-253. https://doi.org/10.1023/A:1015726423707.

Kashif, M. Z. (2017). The moderating effect of religiosity on ethical behavioural intentions: An application of the extended theory of planned behaviour to Pakistani bank employees. – Personnel Review(46(2)), pp. 429-448. doi:https://doi.org/10.1108/PR-10-2015-0256.

Khanna, S. K. (2020). Food Availability, Food Security, and Maternal Mental Health. – Ecology of Food and Nutrition, 59(1), pp. 1-2. https://doi.org/10.1080/03670244.2019.1710337.

Lohmöller, J. (1989). Predictive vs. Structural Modeling: PLS vs. ML. Latent Variable Path Modeling with Partial Least Squares. – Physica, Heidelberg., pp. 199-226. doi:https://doi.org/10.1007/978-3-642-52512-4_5.

Murray, S., Peterson, C., Primo, C., Elliott, C., Otlowski, M., Auckland, S., Kent, K. (2021), "Prevalence of food insecurity and satisfaction with on-campus food choices among Australian university students", – International Journal of Sustainability in Higher Education, 22(4), pp. 731-746. https://doi.org/10.1108/IJSHE-09-2020-0348.

Nabuuma, D., Ekesa, B., Faber, M., Mbhenyane, X. (2021). Community perspectives on food security and dietary diversity among rural smallholder farmers: A qualitative study in central Uganda. – Journal of Agriculture and Food Research, 5, 100183. https://doi.org/10.1016/j.jafr.2021.100183.

Pakravan-Charvadeh, M. R., Mohammadi-Nasrabadi, F., Gholamrezai, S., Vatanparast, H., Flora, C., Nabavi-Pelesaraei, A. (2021). The short-term effects of COVID-19 outbreak on dietary diversity and food security status of Iranian households (A case study in Tehran province). – Journal of cleaner production, 281, 124537. https://doi.org/10.1016/j.jclepro.2020.124537.

Peng, W., Berry, E. M. (2019). The concept of food security. – Encyclopedia of food security and sustainability, 2(1), pp. 1-7. https://doi.org/10.1016/B978-0-08-100596-5.22314-7.

Pinstrup-Andersen, P. (2009). Food security: definition and measurement. – Food security, 1(1), pp.5-7. https://doi.org/10.1007/s12571-008-0002-y.

Prosekov, A. Y., Ivanova, S. A. (2016). Providing food security in the existing tendencies of population growth and political and economic instability in the world. – Foods and raw materials, 4(2), pp. 201-211. https://cyberleninka.ru/article/n/providing-food-security-in-the-existing-tendencies-of-population-growth-and-political-and-economic-instability-in-the-world/viewer.

Salahodjaev, R., Mirziyoyeva, Z. (2021). The link between food security and life satisfaction: Panel data analysis. - Sustainability, 13(5), p. 2918. doi: https://doi.org/10.3390/su13052918.

Shi, S., Ye, Y., Xiao, R. (2022). Evaluation of food security based on remote sensing data – Taking Egypt as an example. – Remote Sensing, 14(12), p. 2876. https://doi.org/10.3390/rs14122876.

Tyutyunik, V. V. (2016). Food independence of the region. – Spatial Economics Prostranstvennaya Ekonomika, (2), pp. 168-182. DOI: 10.14530/se.2016.2.168-182.

Yeszhanova, Z., Yermekbayeva, D. D., Myrzayeva, U. A. (2021). Assessment of food security in Kazakhstan in conditions of crisis Covid-19. – Economics: the strategy and practice. 16(2), pp. 145-153. https://doi.org/10.51176/1997-9967-2021-2-145-153.

Zheng Qiupeng, C. B. (2016). Circular RNA profiling reveals an abundant circHIPK3 that regulates cell growth by sponging multiple miRNAs. – Nature communications, pp. 1-13. doi:https://ui.adsabs.harvard.edu/link_gateway/2016NatCo...711215Z/doi:10.1038/ncomms11215.

Zou, J., Guo, S. (2015). China's food security evaluation based on factor analysis. – American Journal of Industrial and Business Management, 5(06), p. 447. doi:10.4236/ajibm.2015.56044.