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**ANNALS OF THE POLISH ASSOCIATION  
OF AGRICULTURAL AND AGRIBUSINESS ECONOMISTS**

ROCZNIKI NAUKOWE  
STOWARZYSZENIA EKONOMISTÓW ROLNICTWA I AGROBIZNESU

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Received: 30.12.2022  
Acceptance: 18.05.2023  
Published: 20.06.2023  
JEL codes: F51

Annals PAAAE • 2023 • Vol. XXV • No. (2)

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DOI: 10.5604/01.3001.0053.4242

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**THE IMPACT OF FOOD IMPORTS FROM RUSSIA  
AND UKRAINE ON THE FOOD SECURITY  
OF THE GULF COOPERATION COUNCIL**

Key words: food security, Gulf Cooperation Council countries, Russian-Ukrainian conflict, food imports, international trade

**ABSTRACT.** The article analyzes the impact of food imports from Russia and Ukraine on the food security of the Gulf Cooperation Council (GCC) countries. The analysis focuses on data collected by the Food and Agriculture Organization of the United Nations (FAO) from 2000 to 2021 and a literature review of the impact of armed conflicts on food security. In the context of the war between Russia and Ukraine, it is emphasized that it negatively affects food security on the international stage, which may lead to a deepening food crisis. Correlation and linear regression analysis were used to determine the relationship between food imports from Russia and Ukraine and total food imports to GCC countries to examine whether there is a relationship between these variables. The correlation analysis showed a strong positive relationship between food imports from Russia and Ukraine and total food imports to GCC countries, while the regression analysis showed a moderate positive relationship. However, it was noted that GCC countries have taken steps in recent years to become more independent of a single supplier of agricultural products and improve food security. Ultimately, the results of the analysis suggest that food security in GCC countries requires further attention and action to increase independence and reduce the risk of food shortages.

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## INTRODUCTION

The Gulf Cooperation Council (GCC), is a regional intergovernmental organization consisting of six Middle Eastern countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. The GCC was established in 1981 with the aim of promoting economic cooperation and integration among its member states. These countries are known for their abundant natural resources, particularly oil and natural gas. They are among the largest producers of oil and natural gas in the world, contributing significantly to their economic growth. In recent years, these countries have taken important steps towards diversifying their economies and reducing dependence on natural resources [Hvidt 2013].

The GCC countries have a combined population of over 50 million people, and their numbers are increasing year by year. These economies are among the fastest-growing in the world, and the region has become an important hub for trade, finance, and tourism in the Middle East. Ensuring adequate diversification of food supplies is one of the key conditions for maintaining food security in GCC countries. Due to desert climate conditions, these countries satisfy most of their basic food needs through imports, including from Russia and Ukraine. Given the current situation related to the Russian-Ukrainian conflict, which has affected the decrease in food exports to the GCC countries, it is important for these countries to take appropriate steps to increase the diversification of food supplies and seek alternative sources to minimize the risk of food shortages in the event of a deterioration in the political and economic situation in the region. Food security is a priority for the GCC countries, and ensuring food security is a fundamental strategic task for the region's governments [Efron et al. 2018].

Russia and Ukraine are the two largest exporters of grains in the world. In 2020, Russia accounted for 18.7% of global wheat exports, while Ukraine accounted for 9.1%. Therefore, Russia and Ukraine contribute to approximately 30% of global wheat trade, 32% of barley, 17% of corn, and over 50% of sunflower oil, seeds, and feed [OECD 2022]. About 40% of Ukraine's wheat and corn exports go to the Middle East. The ongoing conflict is causing significant disruptions in the supply chain of agricultural and food products and significantly impacting domestic production costs in the agricultural sector [OECD 2022].

The Russian invasion of Ukraine has exposed weaknesses not only in the energy system but has also contributed to the acceleration of a global food crisis. Similar to the crisis associated with the COVID-19 pandemic, this conflict affects agriculture, food production, and poses a direct threat to food security [FSP 2022]. Food security is a state in which all people on our planet have access to safe and nutritious food that meets their basic nutritional needs, aligning with the fundamental human right to life and harmonious development [Wiśniewska, Wyrwa 2022].

According to the Polish Ministry of Agriculture and Rural Development, food security encompasses actions taken by states to ensure access to quality food (safe, nutritious, and diverse) in the right quantity. These actions also aim to ensure affordable food through an uninterrupted supply chain. Food security exists in a country when there is an adequate supply of quality food available to everyone [MRiRW 2023]. In this article, the definition of food security adopted by the Food and Agriculture Organization of the United Nations (FAO) is used. The FAO defines food security as a situation in which 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 an active and healthy life [FAO 2023].

The aim of the article is to answer the question of whether the import of food from Russia and Ukraine affects the food security of the GCC countries.

## MATERIAL AND METHODS

The study employed correlation and linear regression analysis to determine the relationship between food imports from Russia and Ukraine and the total food imports to the GCC countries. These analytical tools were utilized to assess not only the strength of the relationship but also the extent to which a given variable describes a specific phenomenon. The analysis covered data from the years 2000 to 2021, utilizing statistical data collected by the Food and Agriculture Organization of the United Nations (FAO). The study also considered the impact of the Russian-Ukrainian conflict on the global agricultural market. In the theoretical framework, a literature review was conducted to explore relevant concepts. The research focused on the GCC countries, including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

## IMPACT OF THE RUSSIAN INVASION OF UKRAINE ON THE GLOBAL AGRICULTURAL MARKET

The war in Ukraine has raised numerous concerns regarding the possibility of sowing and harvests, as well as exporting them to the international market. The temporary closure of Ukrainian ports on the Black Sea has caused significant disruptions in foreign trade of agricultural products. Consequently, there has been a vision of a global food catastrophe, mass migration, and political instability worldwide. Additionally, the agricultural market situation is further complicated by uncertainty regarding Russian export prospects, particularly in the context of economic and financial sanctions imposed on the country. This is not only a problem for Russia itself but also for its trading partners who rely on Russian agricultural products. The war also results in significant disruptions in foreign

trade of agricultural products, primarily causing price uncertainties in the international grain market. Simulations conducted by FAO indicate that the interruption of grain and sunflower seed exports from Russia and Ukraine could lead to an increase in international food and feed prices by 8 to 22 percentage points above the already elevated baseline prices. If the war in Ukraine continues to restrict exports in the 2022/2023 season, the supply gap in global markets will persist [FAO 2022].

The war in Ukraine has also contributed to the disruption of logistical processes. It has resulted in the destruction of transportation infrastructure, including inland, port, and warehouse facilities. The increase in insurance premiums for vessels sailing in the Black Sea has led to higher costs of maritime transportation. These factors have impacted the costs of food import and export [Husain 2022].

War also poses a risk to food production. The prospects for sowing winter crops in the years 2022/2023 have been uncertain in both Ukraine and Russia. Shortages of production inputs also negatively affect agricultural activities. FAO estimates that the area of winter crops sown in Ukraine has decreased by approximately 20% [Mottalebi et al. 2022]. The harvest of winter wheat in Ukraine is expected to start in early July 2023, with about 25% of the areas planted likely to remain unharvested. The availability of fuel will also impact from which areas the harvest can be collected and stored [Reuters 2022].

In the Russian Federation, major disruptions in arable farming are not anticipated. However, there is uncertainty regarding the export of agricultural products despite international sanctions excluding both food and fertilizers. Any losses will lead to a reduction in farmers' income, negatively impacting future decisions regarding agricultural production [Mottaleb et al. 2022]. Additionally, economic sanctions imposed on the Russian Federation may disrupt the import of agricultural production inputs, which are highly dependent on pesticides and seeds [BBC 2022]. This could result in lower yields and quality of agricultural products, posing risks to the Russian agricultural sector and global food supplies.

War also triggers a humanitarian crisis. If the restrictions on grain exports by Ukraine and the Russian Federation persist due to the war, it will exert additional pressure on international food prices, with detrimental effects on economically vulnerable countries. Simulations by FAO suggest that under such a scenario, the global number of undernourished people could increase by 8 to 13 million in the years 2022/2023, particularly in the Asia-Pacific region, followed by Sub-Saharan Africa, the Middle East, and North Africa. If the war prolongs, these regions will experience its consequences for a significantly longer period [OECD 2022].

Low exports from Ukraine and the Russian Federation in 2022 and 2023, assuming no global production response due to high prices and lack of access to fertilizers, will result in an increase in the number of undernourished people to approximately 19 million in 2023 [Haque et al. 2022].

War also poses a threat to energy security. The Russian Federation is a key player in the global energy market. The sharp increase in oil prices also affects agriculture, as it is an energy-intensive industry, especially in developed regions. Agriculture has a high demand for energy used directly in the form of fuels, gas, and electricity, as well as indirectly through agrochemicals such as fertilizers, pesticides, and herbicides. Rising input costs will translate into higher production costs and ultimately higher food prices. It may also lead to reduced utilization of inputs, lower yields and harvests in the 2022/2023 season, further driving up prices and threatening global food security in the coming years [Ersahin, Mustafa Evren 2022].

Another issue caused by the war is currency risk. Agriculture serves as the foundation of many developing economies, most of which rely on borrowing in U.S. currency. Therefore, a sustained appreciation of the U.S. dollar against other currencies has a negative impact on these countries, including their agricultural and food sectors. Additionally, potential limitations on GDP growth in several parts of the world affect the global demand for agricultural and food products, with adverse consequences for global food security [Glauber, Mamun 2022].

According to a report by Human Rights Watch (HRW) published in March 2022, governments must ensure that the conflict in Ukraine does not exacerbate the food crisis in the Middle East and North Africa, in order to protect everyone's right to affordable and nutritious food. The disruptions associated with the Russian-Ukrainian war are already accelerating food price increases and deepening poverty. According to Lama Fakhri, director of Human Rights Watch for the Middle East and North Africa, "... global food supply chains require global solidarity in times of crisis. Without coordinated actions to ensure food security and affordability, the conflict in Ukraine will worsen the global food crisis, especially in the Middle East and North Africa" [CNN 2022].

Greenpeace has also issued recommendations, stating that national governments should develop strategies that strengthen the food independence of local communities. Striving for a sustainable food system based on food sovereignty and agriculture is crucial for the future of humanity [Tazrouiti 2022].

Meeting food needs, which encompass not only physiological but also emotional and intellectual elements [Daniek 2018], is expressed as one of the priorities of the concept of sustainable development. According to the second goal of sustainable development, it is necessary to "... end hunger, achieve food security and improved nutrition, and promote sustainable agriculture" [UNIC Warsaw 2022].

## CHALLENGES RELATED TO FOOD SECURITY IN THE GULF COOPERATION COUNCIL COUNTRIES

From a historical perspective, food security has not been a problem for the Gulf Cooperation Council countries. Capital-rich nations in the region have had no restrictions on food imports and have been less susceptible to price risks compared to other food importers. They have always been able to supplement domestic production shortfalls. As a result, in 2019, GCC member countries were recognized as the most food secure in the Arab world and among the most food secure globally [Hassen, Bilali 2019].

According to the World Food Security Index<sup>2</sup>, which measures the level of food security in 113 countries by assessing categories such as food affordability, availability, quality, and safety, the GCC countries are considered among the most secure. This trend has been consistent since the index was first developed in 2012 [The Economist 2022].

Among the GCC countries, the United Arab Emirates ranks highest globally, followed by Qatar, Oman, Bahrain, Saudi Arabia, and Kuwait. Despite their high rankings, the region still lacks control over food sources and remains heavily reliant on imports. The reasons for this high dependence on food imports include:

1. Growing food demand: The GCC countries have a population of approximately 52 million, and the population continues to increase. The population growth is driven not only by high birth rates but also by immigration. The region has experienced significant inflows of immigrants in recent years, especially from other Middle Eastern and Asian countries. Immigrants come to the GCC countries in search of employment and better economic opportunities, contributing to the region's economic growth.
2. The desert climate of the region hampers the production of certain crops, further increasing the reliance on imports.
3. Limited availability of arable land. GCC countries have a small amount of arable land, which limits their ability to produce their own food. As a result, they need to import a significant portion of their food to meet demand.
4. Ensuring stable and diversified food supplies. By importing food from various sources, GCC countries reduce the risk associated with relying on a single food supply source. This helps ensure the reliability of food supplies and meet the needs of the population [Efron et al. 2018].

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<sup>2</sup> The Global Food Security Index serves as a metric enabling precise measurement of food and nutrition availability, affordability, and safety worldwide through the application of scientific methodologies. Developed by the Economist Intelligence Unit, this index assesses the level of food security in 113 countries, evaluating the potential threat of food scarcity based on various factors including price affordability, accessibility, attainability, nutritional value, and food safety.

Table 1. Ranking of GCC Countries based on the Global Food Security Index in 2022

Country	World ranking	Arab World ranking
United Arab Emirates	23.	1.
Qatar	30.	2.
Oman	35.	3.
Bahrain	38.	4.
Saudi Arabia	41.	5.
Kuwait	50.	6.

Source: [GFSI 2022]

To achieve food security in GCC countries, a combination of several strategies is necessary. The most important ones include:

1. Foreign agricultural investments: Following the food crisis in 2007-2008, GCC countries started implementing strategies of purchasing or leasing agricultural land abroad to export a portion of the cultivated crops back to their own countries. Since then, these countries have acquired land in Africa and Australia, investing in existing agricultural operations and exporting agricultural produce to maintain control over the food supply chain.
2. Strategic reserve investments: Accumulating food reserves can provide GCC governments with a certain degree of protection against price and supply risks. It strengthens their purchasing power, signalling to suppliers that they have alternative sources of supply, thereby mitigating price inflation. While building up reserves is a more effective strategy than pursuing self-sufficiency, it comes with potential challenges, such as ensuring safe grain storage.
3. Increasing domestic production capacity: Previous experiences of GCC countries in increasing local food production have resulted in significant environmental damage and depletion of non-renewable water resources, with limited production outcomes. Therefore, there is a need to transition to sustainable agricultural production systems that ensure food and nutrition security [Hassen, Bilali 2022].
4. Strategic reserve investments: Accumulating reserves can provide GCC governments with a certain degree of protection against price and supply risks, while also strengthening their purchasing power by signalling to sellers that alternative sources of supply are available, thereby countering price inflation. Although stockpiling is a more effective strategy than striving for self-sufficiency, it is associated with various potential threats, such as ensuring safe grain storage.

- 5. Increasing domestic production capacity: Previous experiences of GCC countries in enhancing local food production have resulted in significant environmental damage and substantial depletion of non-renewable water resources, with minimal production outcomes. Consequently, there is a need to transition towards sustainable agricultural production systems that ensure food and nutrition security [Hassen, Bilali 2022].
- 6. Food imports in GCC countries account for approximately 85% of the total imports. Therefore, the impact of food imports from Russia and Ukraine on the overall food import in GCC countries was analyzed. Regression analysis was employed using data from 2000 to 2021 to examine this influence. A scatter plot was presented, illustrating the relationship between food imports from Russia and Ukraine and the total food import in GCC countries, thereby facilitating a better understanding of the discussed impact (Figure 1).

Based on the data presented in Figure 1, it can be inferred that there exists a moderate positive relationship between the food import from Russia and Ukraine and the total food import to GCC countries. It can also be observed that as the food import from Russia

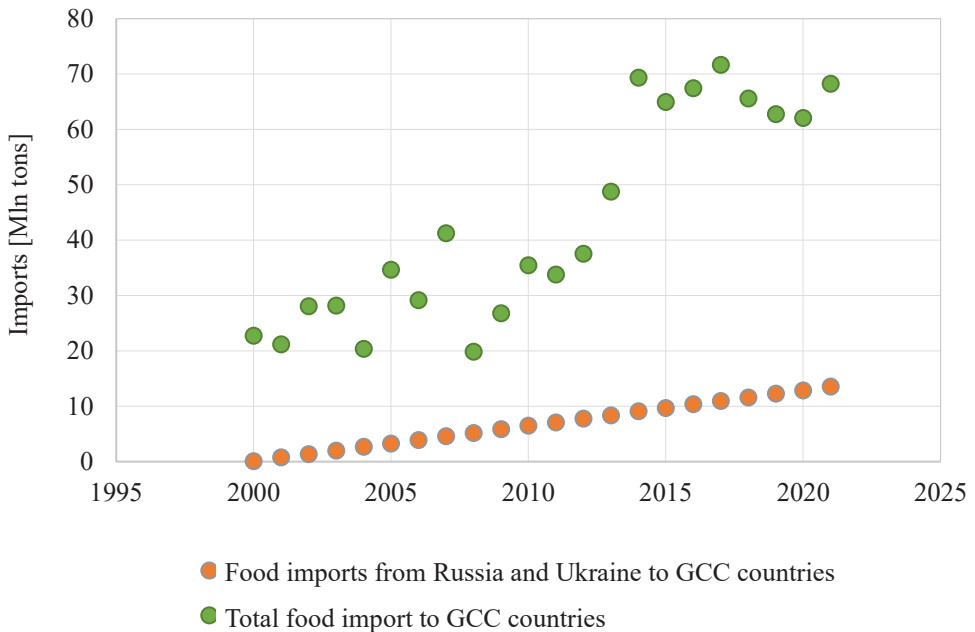


Figure 1. The relationship between food imports from Russia and Ukraine and the total food imports to GCC countries from 2000 to 2021

Źródło: own study based on [FAO 2022]



and Ukraine increases, the total food import to GCC countries also increases, suggesting a positive correlation between these variables. However, it is worth noting that this relationship is not strong due to significant fluctuations in the values of food import from Russia and Ukraine and the total food import to GCC countries in different years.

Prior to conducting the regression analysis, the Pearson correlation coefficient was calculated between the variables, resulting in a value of 0.8876, indicating a strong positive association between the food import from Russia and Ukraine and the total food import to GCC countries (Table 2).

Table 2. Correlation Analysis

Variable	Correlation
	total food import to GCC countries ( $X_2$ )
Import of food from Russia and Ukraine to GCC countries ( $X_1$ )	0.8876*

\*  $p < 0.05$

Źródło: own study

The regression analysis indicates that there is a moderate positive relationship between the import of food from Russia and Ukraine and the total import of food to GCC countries, as evidenced by the correlation coefficient value of  $R = 0.884$  and  $R^2 = 0.781$  (Table 3). This implies that approximately 78% of the variability in the total food import to GCC countries can be explained by the variability in the import of food from Russia and Ukraine.

The analysis of variance shows that the regression is statistically significant (F-significance =  $1.07518E-07$ ) and explains approximately 76.9% of the variability in the dependent variable  $X_1$ , indicating that 76.9% of the variability in the total food import to GCC countries can be explained by the variability in the food import from Russia and Ukraine. The slope coefficient is 0.185, indicating that each additional ton of food imported from Russia and Ukraine contributes to an increase of approximately 0.2 tons in the total food import to GCC countries. However, it is worth noting that the p-value for the intercept coefficient is 0.290, indicating that it is not statistically significant, and thus it cannot be concluded that the food import from Russia and Ukraine has an impact on the total food import to GCC countries. The p-value for the slope coefficient is very low ( $1.07518E-07$ ), indicating its statistical significance.

Table 3. Results of regression equation estimation

Regression statistics					
Multiple R	0.884				
R-squared	0.781				
Adjusted R-squared	0.769				
Standard Error	1,908,558.256				
Observations	21				
Analysis of variance	df	SS	MS	F	F-Statistic significance
Regression	1	2.47392E+14	2.47392E+14	67.9164802	1.0752E-07
Residual	19	6.92093E+13	3.64259E+12	-	-
Total	20	3.16602E+14	-	-	-
	Coefficients	Standard error	t-stat	p-value	
Intercept	-1,162,943.805	1,090,827.557	-1.0661115	0.29973383	
Import of food from Russia and Ukraine ( $X_1$ )	0.18610184	0.022582035	8.241145565	1.0752E-07	

Source: own study

Although the research demonstrates a positive relationship between the food import from Russia and Ukraine and the total food import to GCC countries, it cannot be considered that the import from these countries is crucial for ensuring food security in the GCC. In recent years, there has been a significant increase in global interest in food security in GCC countries.

According to Meszar Tarik, the conflict between Russia and Ukraine poses a significant threat to global food security. This could result in increased levels of hunger and malnutrition in regions such as the Middle East, North Africa, and Central Asia. Countries' responses to the crisis vary and depend on various factors, such as resource levels and economic capabilities. GCC countries have larger resources and economic capabilities than many other Arab states. They tend to adopt a preventive approach to crisis management. To avoid crises or mitigate their impact, these countries develop proactive strategies for stockpiling their supplies and have long-term plans for their own production and supply diversification [Tarik 2022].

Tarek Ben Hassen and Hamid El Bilali conducted research to assess the impact of the COVID-19 pandemic on food security in this region. The research showed that GCC countries, despite their high dependence on food imports, experienced minimal impact on food availability and prices due to the pandemic. They were able to avoid more severe problems faced by other regions of the world, thanks to various measures and government policies implemented to ensure food security [Hassen, Bilali 2022].

According to Hussein Amery, minimizing food waste is crucial for the food security of GCC countries as it helps utilize existing food resources in a more efficient manner. This, in turn, saves resources that can be allocated to the development of food-related infrastructure and technologies. Furthermore, minimizing food waste helps alleviate pressure on water resources, which is critical for regions with low water availability, such as the Middle East. All of this contributes to increasing the food resilience of societies to changing climate, political, and economic conditions, which is crucial for ensuring food stability and social development [Amery 2019].

## CONCLUSIONS

The Russian-Ukrainian war poses a global food crisis threat that can exacerbate hunger and malnutrition in the Middle East, North Africa, Central Asia, and beyond. This war may result in difficulties in delivering food from Russia and Ukraine to these countries, leading to price increases and shortages of certain products in the market.

The Gulf Cooperation Council countries, being among the wealthiest economies globally, remain minimally vulnerable to food shortages caused by this conflict. While analyses indicate a positive correlation between food imports from Russia and Ukraine and the total food imports to the GCC countries, it does not imply that imports from these countries are critical for ensuring the food security of the GCC countries. Over the past 20 years, the GCC countries have implemented numerous measures to diversify their sources of agricultural products and improve food security. The economic crisis of 2007-2008 served as a catalyst for these changes, prompting the GCC countries to pursue strategies such as purchasing or leasing agricultural land abroad to export crops back to their own countries. As part of this strategy, they acquired land in Africa and Australia, investing in existing farms or establishing new ones, with the aim of maintaining control over the food supply chain. Currently, these countries are implementing strategies to increase domestic food production, diversify food supplies, establish strategic food reserves, minimize food waste, and strengthen trade and investment ties with other global economies to ensure stable supplies.

In summary, food security in the GCC region remains a challenging issue, but efforts are being made to address its threats.

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WPLYW IMPORTU ŻYWNOSCI Z ROSJI I UKRAINY  
NA BEZPIECZEŃSTWO ŻYWNOSCIOWE KRAJÓW RADY  
WSPÓŁPRACY ZATOKI PERSKIEJ

Słowa kluczowe: bezpieczeństwo żywnościowe, kraje RWZP, konflikt rosyjsko-ukraiński, import żywności, handel międzynarodowy

**ABSTRAKT.** W artykule dokonano analizy wpływu importu żywności z Rosji i Ukrainy na bezpieczeństwo żywnościowe krajów Rady Współpracy Zatoki Perskiej (RWZP). Skupiono się na analizie danych zgromadzonych przez Organizację Narodów Zjednoczonych do spraw Wyżywienia i Rolnictwa (FAO) za lata 2000-2021 oraz na przeglądzie literatury dotyczącej wpływu konfliktów zbrojnych na bezpieczeństwo żywnościowe. W kontekście wojny między Rosją i Ukrainą podkreślono, że negatywnie wpływa ona na bezpieczeństwo żywnościowe na arenie międzynarodowej, co może prowadzić do pogłębienia kryzysu żywnościowego. Do określenia relacji między importem żywności z Rosji i Ukrainy a całkowitym importem żywności do krajów RWZP wykorzystano analizę korelacji i regresji liniowej, aby zbadać czy istnieje zależność między tymi zmiennymi. Analiza korelacji wykazała silny dodatni związek między importem żywności z Rosji i Ukrainy a całkowitym importem żywności do krajów RWZP, natomiast analiza regresji wykazała umiarkowaną dodatnią zależność. Zauważono jednak, że kraje RWZP podjęły w ostatnich latach działania mające na celu uniezależnienie się od jednego dostawcy produktów rolnych i poprawę bezpieczeństwa żywnościowego. Ostatecznie, wyniki analizy sugerują, że kwestia bezpieczeństwa żywnościowego w krajach RWZP wymaga dalszej uwagi i działań, mających na celu zwiększenie niezależności i redukcję ryzyka niedoboru żywności.

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Proposed citation of the article:

Kozielec Anna, Jakub Piecuch. 2023. Impact of food imports from Russia and Ukraine on the food security of Gulf Cooperation Council countries. *Annals PAAAE XXV* (2): 83-96.