

Analysis of Changes in Agricultural Import Trade between China- Russia and China-Ukraine under the Background of the Russia-Ukraine Conflict

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ABSTRACT

This study examines changes in the import volumes of major agricultural products—wheat, corn, barley, soybeans, and rapeseed oil—from Russia and Ukraine to China during 2021 – 2022. The findings reveal that the Russia-Ukraine conflict disrupted agricultural production in both countries, subsequently affecting China's import demand for these products. To address uncertainties in the international market, the study recommends strengthening domestic agricultural production capacity, increasing self-sufficiency rates for key crops such as soybeans and corn, and diversifying sources of imports. These measures aim to reduce reliance on a single country and ensure the stability and security of China's food supply.

KEYWORDS

Agricultural Import Trade; China- Russia; China-Ukraine

1 Introduction

Russia and Ukraine are indeed significant agricultural exporters, especially when it comes to key global staples. Together, they account for about 30% of the world's wheat exports, 20% of corn exports, and 60% of the world's sunflower oil exports, with Ukraine alone contributing nearly half of the global sunflower oil supply^[1-2].

These contributions underscore the critical role both countries play in global food security, particularly for nations dependent on these key agricultural products. However, the ongoing conflict has disrupted supply chains, leading to rising prices and concerns over future supply stability. In early February 2022, the Russia-Ukraine conflict broke out, disrupting the food export channels of both countries.

This conflict has restricted arable land and cultivation activities, created uncertainty in output expectations, and led to a sharp decline in food supply, severely impacting the global food supply structure.

The Russia-Ukraine conflict poses significant challenges to China in ensuring the security of agricultural import sources and channels, increasing the cost of safeguarding food security. Furthermore, the conflict has driven up input costs, exacerbated energy market volatility, and raised domestic agricultural production costs, thereby affecting China's agricultural production and trade.

This paper analyzes the impact of the Russia-Ukraine conflict on China's grain production costs and the agricultural trade supply chains between China and Russia, as well as China and Ukraine. It further explores strategies for securing control over food security in the face of turbulent international circumstances.

2 Background

2.1 Russia and Ukraine are major agricultural producers

Russia, with its vast landmass—the largest in the world—boasts extensive black soil regions, forming the largest black soil belt globally and providing a natural advantage for cultivation. Continuous investment in agriculture, expansion of arable land, and advancements in agricultural technology have made Russia one of the world's leading grain producers and exporters. Russian wheat exports account for about one-fifth of the global total. According to the USDA database, Russia's grain output reached 156 million tons in 2022, with wheat production alone amounting to 91 million tons. Over the past decade, Russia's wheat production has steadily increased, with a growth rate of 102.1% and a stable global market share. By 2022, Russia's wheat production accounted for 12% of the global total, reaching a peak of 92 million tons^[3]. Ukraine, characterized by flat terrain and extensive plains, dedicates approximately 70% of its land area to agriculture. Holding nearly 30% of the world's black soil, Ukraine enjoys fertile soil and high-quality crops. Known as the "Breadbasket of Europe," Ukraine supplies substantial quantities of grain to Europe and other regions. Due to its geographical advantages, corn and wheat are Ukraine's primary grain crops. According to USDA data, between 2011 and 2021, Ukraine's corn production accounted for 2.5%–3.5% of the global total. In 2021, Ukraine produced 42.16 million tons of corn, representing 3.48% of global output, and 33 million tons of wheat, accounting for 3.57% of the global total^[4].

2.2 Russia and Ukraine are major grain exporters

Due to their vast land areas, low population densities, and natural advantages for cultivation, along with domestic demand far below supply levels, both Russia and Ukraine are not only major grain producers but also significant exporters.

As shown in Table 1, from 2012 to 2021, Ukraine's corn exports accounted for approximately 15% of the global total, with fluctuations of about $\pm 2\%$ to 3%. Russia's corn exports contributed around 2% to 4% of the global total, making the combined export share of Russia and Ukraine approximately 15% to 20% of global corn exports. Regarding wheat, the export volumes of both Russia and Ukraine have steadily increased each year. Since 2017, Russia's wheat exports have remained around 20%, while Ukraine's have been around 10%. Together, the wheat exports of Russia and Ukraine account for nearly 30% of the global total.

Table 1 Share of Global Corn and Wheat Exports by Russia and Ukraine (2012–2021)

Year	Share of Global Corn Exports(%)			Share of Global Wheat Exports(%)		
	By Russia	By Ukraine	Total share	By Russia	By Ukraine	Total share
2012	2.01	13.37	15.38	8.21	5.23	13.44
2013	3.19	15.27	18.44	11.18	5.87	17.05
2014	2.26	13.86	16.12	13.86	6.84	20.7
2015	3.91	13.84	17.75	14.77	10.08	24.85
2016	3.48	13.28	16.76	15.15	9.86	25.01
2017	3.71	12.12	15.83	22.67	9.71	32.38
2018	1.51	16.68	18.19	20.64	9.21	29.85
2019	2.36	16.84	19.2	18.01	10.97	28.98
2020	2.18	13.12	15.3	19.28	8.31	27.59
2021	2.24	13.75	15.99	16.92	11.6	28.52

In addition to corn and wheat, according to data from UN Comtrade^[5-6,8], Russia and Ukraine also play a significant role in the global exports of barley, rapeseed, sunflower oil, and sunflower seeds, with their export volumes ranking among the top three worldwide. In 2021, Russia exported 3.96

million tons of barley, ranking fourth globally with a share of 12.64%. Ukraine exported 5.34 million tons of barley, ranking second in the world with a share of 15.23%. Ukraine's rapeseed exports reached 2.41 million tons, accounting for 10.23% of global exports. Russia's sunflower seed exports amounted to 1.41 million tons, accounting for 20.01%. Russia exported 2.52 million tons of sunflower oil, representing 22.36% of global exports, while Ukraine's sunflower oil exports reached 6.35 million tons, making up 54.62% of the global total. Thus, Russia and Ukraine are also major exporters of oilseeds.

2.3 Russia and Ukraine are important global suppliers of fertilizers

Russia and Ukraine are also major exporters of agricultural fertilizers. In 2019, Russia's supply of nitrogen, phosphorus, and potassium (NPK) fertilizers was approximately 7.57 million tons, accounting for 30% of global supply, making it the world's second-largest producer of NPK fertilizers. According to data compiled from UN Comtrade, from 2019 to 2021, Russia's fertilizer export values were \$8.385 billion, \$6.954 billion, and \$10.285 billion, respectively. Ukraine's fertilizer export values were \$223 million, \$375 million, and \$632 million, respectively. Together, the combined global market share of fertilizer exports from Russia and Ukraine accounted for 15.36%, 14.23%, and 24.85% in those years.

3 Changes in Agricultural Import Trade between China- Russia and China-Ukraine

Table 2 Analysis of Changes in Major Agricultural Imports from Russia to China during 2021 to 2022

Product	Changes in the Volume of Imports			Changes in the Share of Imports of This Category of Products		
	Import Volume in 2021 (10,000 tons)	Import Volume in 2022 (10,000 tons)	Change in Import Volume (10,000 tons)	Share of China's Total Imports of This Category of Products in 2021 (%)	Share of China's Total Imports of This Category of Products in 2022 (%)	Change in the Share of Imports of This Category of Products (%)
Wheat	10.36	9.25	-1.11	1.07	0.95	-0.95
Corn	9.07	8.08	-0.99	0.32	0.26	-0.06
Barley	9.86	8.59	-1.27	25.75	22.31	-3.45
Soybean	21.94	18.84	-3.1	0.23	0.17	-0.06
Rapeseed Oil	44	37	-7	26.1	24.89	-1.21

The agricultural products most affected by the Russia-Ukraine conflict in terms of imports from Russia to China include wheat, corn, barley, soybeans, and rapeseed oil. The import volumes of these products have all declined to varying degrees. This decline is due to the impact of the Russia-Ukraine conflict, which has led to Western sanctions on Russia. The United States and its allies excluded Russia from the SWIFT international payment system, affecting Russia's import and export trade. Additionally, the war has caused increases in the prices of fertilizers, raw materials, and energy, and these costs have been passed on to Chinese consumers, forcing them to reduce their demand for Russian wheat, corn, barley, soybeans, and rapeseed oil.

To ensure food security, increasing soybean imports has become a necessary option. With the improvement in people's living standards and the growing demand for soy-based products and protein, reducing dependence on foreign soybean supplies remains a key issue to address. In response, China has developed a soybean development plan for the 14th Five-Year Plan period, and it is expected that the problem of insufficient domestic soybean supply will gradually be alleviated.

in the future.

Table 3 Analysis of Changes in Major Agricultural Imports from Ukraine to China during 2021 to 2022

Products	Changes in the Volume of Imports			Changes in the Share of Imports of This Category of Products		
	Import	Import	Change in	Share of China's To-	Share of China's To-	Change in the
	Volume in	Volume in	Import Vol-	tal Imports of This	tal Imports of This	Share of Im-
	2021 (10,	2022 (10,	ume (10,	Category of Prod-	Category of Prod-	ports of This
	000 tons)	000 tons)	000 tons)	ucts in 2021 (%)	ucts in 2022 (%)	Category of
						Products (%)
Wheat	823	742	-81	29.22	24.95	-4.27
Barley	9.86	8.59	-1.27	25.75	22.31	-3.44
Rapeseed Oil	108	92	-16	64	52.03	-11.97

The agricultural products most affected by the Russia-Ukraine conflict in terms of imports from Ukraine to China include corn, barley, and rapeseed oil. The import volumes of these three products have shown a downward trend. The reason for this decline is the impact of the war on Ukraine, which is located in the conflict zone. The war has not only disrupted farming conditions but also caused widespread fear, making it difficult to carry out normal agricultural production. Additionally, Russia, as a major supplier of natural gas to Europe, has contributed to a rise in energy prices due to the conflict, which has in turn increased the production costs of Ukrainian agricultural products. This has led to higher prices for corn, barley, and rapeseed oil, ultimately reducing China's demand for these products from Ukraine.

Corn is a vital energy feed for China, and the demand for it in both feed and industrial uses is expected to continue growing. As a result, the domestic supply of corn faces considerable pressure. Therefore, it is urgently needed to improve corn production capacity to ensure a continuous and stable supply.

4 Major Conclusions

The Russia-Ukraine conflict has had a profound impact on China's agricultural import trade with Russia and Ukraine, particularly affecting the import volumes of key agricultural products such as wheat, corn, barley, soybeans, and rapeseed oil, all of which have seen varying degrees of decline. Imports of agricultural products from Russia have been affected by both Western sanctions and the exclusion from the SWIFT payment system, which has led to increased agricultural production costs in Russia. These costs have subsequently been passed on to Chinese consumers. Meanwhile, the war has caused a surge in energy and raw material prices, driving up agricultural product prices and reducing China's demand for these goods.

The situation with Ukraine is even more complex, as the war has directly disrupted agricultural production conditions. Due to Ukraine being in a conflict zone, its agricultural activities have been severely constrained. Additionally, rising energy prices have further pushed up the production costs of Ukrainian agricultural products, leading to a reduction in China's imports of Ukrainian corn, barley, and rapeseed oil.

Overall, the Russia-Ukraine conflict has not only affected China's agricultural import sources but also posed challenges to domestic food security and agricultural production. To address these challenges, it is recommended that China strengthen its domestic production capacity for key agricultural products, particularly for soybeans and corn, to ensure supply security. Increased investment in domestic agricultural technological innovation and production potential, along with

the modernization of agricultural practices, can help raise the food self-sufficiency rate and reduce reliance on foreign imports. Furthermore, optimizing the import structure and expanding new international partnerships will help mitigate the risks associated with changes in international circumstances, ensuring China's food security and stable supply.

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