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Strengthening the role of local agri-food systems in overcoming the consequences of using food as a weapon in Ukraine

Olena Borodina

Doctor of Economic Sciences, Professor
Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine
01011, 26 Panasa Myrnoho Str., Kyiv, Ukraine
<http://orcid.org/0000-0002-9937-5907>

Ihor Prokopa

Doctor of Economic Sciences, Professor
Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine
01011, 26 Panasa Myrnoho Str., Kyiv, Ukraine
<https://orcid.org/0000-0002-3681-2655>

Oksana Rykovska*

PhD in Economic Sciences, Senior Research Fellow
Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine
01011, 26 Panasa Myrnoho Str., Kyiv, Ukraine
<https://orcid.org/0000-0002-2723-8313>

► **Abstract.** One of the vulnerabilities of Ukraine, which was highlighted by the use of food as a weapon in the Russian war against it, was its excessive raw material export orientation and weak internal rooting of the agri-food system, as well as the insufficient resilience of its local links. The purpose of this study was to substantiate the potential for strengthening local agri-food systems through the fuller involvement of small-scale agricultural producers with a focus on meeting the food needs of all segments of the population. The study employed the following methods: system analysis, grouping and classification, statistical analysis, formalisation, abstract and logical. The study covered the manifestations of Russia's use of food to achieve political and military goals in Ukraine, as well as the role of small agricultural producers in mitigating their adverse consequences. It was found that the key to strengthening the sustainability of the agri-food system at both the local and national levels is to provide farm enterprises and household farms with diversified access to domestic markets by stimulating demand for their agricultural products. The study substantiated the forms of implementation of this task through the introduction of programmes of linked food subsidies for vulnerable groups of the population, public procurement from small producers for school meals, and promotion of solidarity food security at the community level. The study assessed the need for resources for these programmes and the potential of small farms to produce the necessary products, showing that the introduction of these programmes will facilitate the transition of agriculture to agroecology. The study also covered the possibility of financing measures to overcome the consequences of the use of food as a weapon while supporting small producers through the use of the National Bank's targeted issue with partial involvement of budgetary funds within the framework of strengthening the national rootedness of the agri-food system, as well as donor support. The practical significance of the findings of this study lies in the possibility of their use in the implementation of food support measures for vulnerable groups and the preparation of a lawsuit to the International Criminal Court regarding the weaponisation of food by the Russian Federation in the war against Ukraine

► **Keywords:** local agri-food systems; smallholder farmers; food subsidies; school meals; solidarity agriculture; agroecology

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*Corresponding author



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► Introduction

From the first days of the full-scale military invasion of Ukraine, Russians have been deliberately using food as a weapon, attacking food warehouses and granaries, destroying crops and soil, food and water supplies, restricting agricultural exports, etc. The consequences of these hostile actions include the impossibility or restriction of public access to food, destruction of food stocks, destruction of the material and technical base of agricultural production, loss of foreign exchange earnings, etc. highlighted one of the key shortcomings of the national agri-food system – the imbalance of the organisational and, accordingly, socio-economic structure of agriculture, which weakens the sustainability of its functioning. It was caused, on the one hand, by the excessive raw material export orientation of the corporate sector tolerated by the state and its focus on large-scale production of a limited set of high-margin agricultural products, and, on the other hand, by insufficient attention to ensuring the progressive development of the family farming system, which has been given the role of food self-sufficiency and filling internal food markets with all other products in emergency situations.

Strengthening the resilience of the agri-food system in general and at the local level specifically is one of the aspects of ensuring food security in extreme conditions. Prior to Russia's full-scale invasion of Ukraine, this aspect was covered in the academic literature mainly in connection with the COVID-19 pandemic. Ya. Gadzalo *et al.* (2020), assessing the formation of demand for food in unforeseen situations, determined that the most vulnerable segments of the population will not be able to provide themselves with even cheap food in such conditions and will need state support. Z. Gerasymchuk & L. Gasukha (2021) substantiated the need to ensure all components of food security at the regional level and strengthen the responsibility of local authorities for this task. As noted by V. Zhuk (2023), in the context of military operations, the focus of scientific research has shifted towards assessing losses and damage from them. N. Klymenko (2022) investigated changes in food security, while A. Zemko (2022) identified the elements of the food system that were most negatively affected. S. Kvasha (2022) covered the main areas of adjusting the state regulation of the food segment of the agricultural market during the war, D. Krylov (2023) explored the general steps to overcome the threats to food security caused by it. They contain, albeit indirectly, the motive of using food as a weapon of Russian military aggression against Ukraine. T. Kharytonova & K. Hryhorieva (2023) consider food as a weapon alongside other forms of destabilisation of food security in war, while M.M. Krawczyk (2021) and C. Dowd *et al.* (2023) – as a special means of achieving military and political goals. Analysing the negative effects of Russia's military aggression on Ukraine's agricultural sector and the need to restore both agricultural infrastructure and export opportunities, O. Skydan *et al.* (2023) outlined the potential of farming and identified areas of support that will further strengthen food security at the national and global levels. At the same time, these studies do not highlight the role of local agri-food systems in meeting the population's

food needs in extreme conditions, the capabilities of small-scale agricultural producers and the mechanisms for their involvement in ensuring the sustainable functioning of these systems.

This suggests that, both under martial law and during the post-war reconstruction of the national economy, measures should be taken to strengthen the sustainability of the agri-food system at the grassroots (local) level and to form its internal roots. This, along with maintaining Ukraine's position on global food markets, will strengthen the social and socio-political framework for sustainable agricultural and rural development, facilitate access to quality food produced by the general population, and help overcome the food shortages and hunger caused by the war. The purpose of this study was to substantiate the mechanisms for strengthening local agri-food systems in overcoming the consequences of the use of food as a weapon in Russia's war against Ukraine.

► Materials and Methods

The methodological framework of the study included theoretical generalisations and substantiation of the role of agri-food systems in providing food to the population in the context of a large-scale war. The findings were obtained through the following methods: system analysis – in formulating the problem and defining the purpose of the study; grouping and classification – in identifying groups of producers, types of products, beneficiaries of food support programmes; statistical analysis – in determining the farming potential and the needs of certain categories of consumers for the relevant agricultural products; formalisation – in modelling scenarios and determining the need for financial resources; abstract and logical – for summarising the findings and formulating proposals.

The study was based on legal regulations, namely the Laws of Ukraine, Resolutions and Orders of the Cabinet of Ministers of Ukraine and relevant Ministries governing social standards, provision of certain categories of the population with food, determination of physiological needs and rational consumption norms, etc. Specifically, the Law of Ukraine “On the State Budget” defines the subsistence minimum and minimum wage as basic social standards (Law of Ukraine No. 2710-IX..., 2022). The Law of Ukraine “On State Social Assistance to Low-income Families” (Law of Ukraine No. 1768-III..., 2000), which regulates the support of vulnerable groups of the population, Order of the Ministry of Health of Ukraine No. 1073 “On Approval of Norms of Physiological Needs of the Population of Ukraine in Basic Food Substances and Energy” (2017), and the MOH recommendations on the “Plate of healthy food” (Plate of healthy food, 2021) define rational food consumption norms.

Data from the State Statistics Service of Ukraine (Agriculture of Ukraine for 2022..., 2023) were used to determine the potential of small producers of vegetable, fruit and berry, and dairy products (farm enterprises and household farms) in the context of their participation in the implementation of food subsidy programmes and school meals for children. The information based on the results of state statistical observations (absolute and relative indicators) is provided without considering the

temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, and part of the temporarily occupied territories. Statistical data reflect the volume of production of the relevant products and their structure by category of farms, as well as the volume of consumption of these products in households.

The calculation of the need for funds to implement the School Milk programme was based on the rational norms for the consumption of dairy products by children in educational institutions approved by the Cabinet of Ministers of Ukraine (Resolution of the Cabinet of Ministers of Ukraine No. 305..., 2021), current information on the purchase price of milk in November 2023 (The price of extra-grade raw..., 2023), and information on the number of children enrolled in educational institutions at the end of 2022 (Preschool education..., n.d.). The national monetary poverty criteria (Law of Ukraine No. 2710-IX..., 2022) and expertly modelled data on the number of poor people in Ukraine in 2023 (Two-thirds of Ukrainians live below..., 2023) were used to determine the number of poor people in Ukraine and assess the need for healthy food.

The proposed scenarios demonstrate the potential for variation in decision-making on food support for vulnerable populations depending on changes in the parameters and financial capabilities of the state and allow assessing the synergistic effect of introducing this type of support.

► Results and Discussion

The use of criminal methods of warfare using food has been condemned by the international community. In 2018, the UN Security Council adopted a resolution (Adopting resolution..., 2018) that condemned the use of hunger as a means of warfare, recognising it as a war crime, and identified three areas of action that indicate the use of food as a weapon. Russia has used them against Ukraine in full, as documented by international and Ukrainian experts: the impossibility of food supplies due to the blockade of Ukrainian cities and villages from the first days of the war, blocking the supply routes of international humanitarian food and drinking water, etc.; deliberate destruction of food warehouses and production facilities of agricultural businesses, farm enterprises and rural estates that provided livelihoods for millions of rural residents; impeding the export of Ukrainian grain to many countries of the world, on which Ukraine's economic security depends, since the main foreign exchange earnings in the country's economy came from agricultural exports (Vasylchenko, 2023). A group of international human rights lawyers, together with the Ukrainian prosecutor's office, are collecting evidence of these war crimes to file a lawsuit with the International Criminal Court (ICC) for Russia's systematic creation of the preconditions for famine in Ukraine (Nosalska, 2023).

According to the Kyiv School of Economics, the availability of food in Ukraine has decreased by 15-43% in the six months since the start of Russia's full-scale aggression (Stolnikovykh *et al.*, 2022). Under martial law, small-scale agricultural producers – primarily farm enterprises and household farms, joined by other citizens and temporarily displaced persons through participation in Victory

Gardens, communal agricultural enterprises, cooperatives, and other community projects – have met the most urgent needs of society for a variety of agricultural products and food (News. Initiatives, n.d.). These experiences and aspirations need to be sustained, developed, and consolidated to overcome war-related damage to the agri-food system and to strengthen its resilience at both local and national levels.

Based on the results of research into active international practices, the key to achieving this objective in Ukraine is to provide small farm enterprises and household farms with diversified access to internal markets by stimulating demand for their agricultural products and food through the introduction of programmes of: (i) linked food subsidies to promote healthy eating among vulnerable populations, (ii) organising public procurement from small producers for special school meals, and (iii) promoting solidarity in food security at the community level. This is essential for strengthening local agri-food systems, as the food in question will be produced, processed, sold (distributed), and consumed in a particular area.

This approach to providing small farm enterprises and household farms with diversified access to markets by stimulating demand for their agricultural products creates an informal space where buyers and sellers meet; a place where political, social, and cultural relationships are formed, and where all participants interact with each other with varying degrees of interdependence and solidarity. Interaction between producers, processors, sellers, and consumers is predominantly horizontal and is based largely on trust.

At the same time, favourable conditions are being created for a fuller transition of agriculture to agroecology, which is especially important given Ukraine's aspirations for membership in the European Union. Global experience shows that the principles and functions of agroecology are most fully implemented at the local level, where the relevant approaches are used by as many small producers as possible, strong links are established between producers and between them and consumers of safe products, and local agri-food markets are formed. This increases the production of healthy food and its consumption by different segments of the population, expands the area of environmentally friendly use of natural resources in agriculture, conserves biodiversity, and strengthens the social and inclusive nature of the agri-food system.

The mobilisation of financial resources for the implementation of the above measures can be carried out based on strategic planning and the use of targeted issuance by the National Bank with partial involvement of budgetary funds: this is how mechanisms are built for simultaneous and interconnected monetisation of needs and investment in the production of goods to meet these needs and connect supply and demand (Grytsenko, 2023). The mechanisms of food supply are not inflationary, as supply and demand are linked and balanced by state indirect financing of the basic human right to national food and the promotion of solidarity for its production and consumption. Such relationships in the food system operate according to a set of rules that are agreed upon between producers, consumers, and various authorities in the respective territory. The gap

between producers and end users is narrowing, distribution chains are becoming much shorter, and financially backed demand is driving supply.

Linking food subsidies to promote healthy diets provided by smallholder/household farms. The adaptive capacity and resilience of household farming is embedded in both the biophysical aspects of the agri-food system (through biodiversity conservation, maintaining healthy soil systems, supporting the self-purification of natural water bodies, etc.) and its socio-economic aspects (knowledge transfer, development or organisational capacity, breaking cycles of poverty, etc.). At the first stage of introducing food subsidies in Ukraine, it is advisable to provide payments for the consumption of vegetables, melons and fruits to restore the immunity of Ukrainians, which has been considerably impaired by the stressful environment exacerbated by direct hostilities. Over time, the list of subsidised foods can be expanded to include other foods that are essential for healthy eating. People who are unable to provide themselves with a sufficient level of nutrition – the poor – need support.

During the war, the number of poor people increased significantly, and by the end of 2022, the poverty rate in Ukraine was 24%. According to the World Bank, in 2023, the poverty rate will reach 55%, meaning that about 18 million people in Ukraine will survive on less than \$5.50 a day (How the poverty level..., 2023). Ukrainian researchers calculate poverty by the subsistence level in factual market prices. Due to the restrictions of martial law and the impossibility of conducting certain studies, “all the data of 2022-2023 are modelled data, according to which poverty was 60% in 2022 and 67% in 2023” (Two-thirds of Ukrainians live below..., 2023). Such is the number of people that will not be able to meet their basic needs and will need state assistance, including food. The poor are more vulnerable (compared to the average Ukrainian) in terms of the level and quality of food consumption. Notably, on average, Ukrainians already consume insufficient amounts of fruit (64% of the norm), milk (52%), fish (59%), and meat (66%) (Halytskyi & Michkovska, 2023). And the poor population falls far short of the average consumption of these food groups (only 50-60%). There-with, the poor are also vulnerable in terms of vegetable consumption (70% of the average), compensating for their lack of vegetables with potatoes. The most vulnerable segments of the population and those who need support the most are households with children, especially those under 3 years of age, as well as families with students and non-working pensioners (Expenditure and resources..., 2022). Making them priority beneficiaries of certain types of assistance should be a pilot project to test the food support programme. In today's unstable environment, the need for food subsidies, including the purchase of fruit and vegetable products, can be calculated in different ways, depending on the priorities for maintaining the lives and health of its citizens.

Variant I. In Ukraine, the subsistence minimum is the basic state social standard based on which state social guarantees, social benefits, and social payments are determined. In 2023, the subsistence minimum was approved in the amount of UAH 2,589.0 per month per person. Given that the recommended ceiling for food

expenditures is 60%, i.e., UAH 1,553.4 per month, and the share of expenditures on fruit and vegetable products is about 18% of the total cost of the consumer basket (Ukrainian consumer basket..., 2019), it is estimated that the population will spend UAH 279.6 per month on these products. Based on projected estimates of the number of poor people in Ukraine (18 million) and the estimated need for the purchase of vegetables and fruits at UAH 279.6 per month, the food subsidy will amount to UAH 5.03 billion per month.

Variant II. According to the World Food Programme, at the end of October 2023, there were 3.8 million undernourished people in Ukraine (HungerMap, n.d.). Due to their limited resources, almost half of them use survival strategies (reducing the number of meals, starving, begging, working for food, etc.) and primarily need financial support for food. According to the average rational consumption norms of the Ministry of Health, an adult should consume 161 kg of vegetable and melon products and 90 kg of fruit and berries during the year (Halytskyi & Michkovska, 2023). Based on the Ukrainian consumption standards, 611.8 thous. t of vegetables and 342.0 thous. t of fruit are needed to meet the needs of 3.8 million people for fruit and vegetables. According to the State Statistics Service, consumer prices increased by 32.1% between December 2021 and November 2023 (Consumer price indices..., n.d.), which led to an increase in the cost of all food products, and the average price of vegetables in November 2023 was 27.8 UAH/kg, and fruit – 46.2 UAH/kg (Product prices, n.d.). Thus, UAH 2.7 billion per month is needed to finance food subsidies for the purchase of fruit and vegetable products for the those in need.

The potential of small producers of vegetable and fruit and berry products in Ukraine is quite sufficient to meet the needs of potential recipients of food subsidies. In the pre-war period, household farms and farm enterprises played a decisive role in the production of these products, although agricultural enterprises, specifically those that used agroecological practices, were increasingly interested in growing the crops in question. Between 2010 and 2021, vegetable production increased by 22.5%, with household farms growing by more than 19%, farm enterprises by almost 15%, and agricultural enterprises by 54%. During this period, production of fruit and berry products increased by 28%: by 4.3 times in farm enterprises, and by 21.3-21.4% in household farms and agricultural enterprises. In 2021, household farms and farm enterprises (small producers) accounted for 88.3% of vegetable production and 86.4% of fruit and berry production (Agriculture of Ukraine for 2021, 2022).

Russia's full-scale military invasion of Ukraine has had a considerable impact on the volume and structure of vegetable production. According to the State Statistics Service, the gross harvest of vegetable crops in 2022 was 7,511.6 thous. t, which is almost a quarter less than in 2021 (Agriculture of Ukraine for 2022, 2023). Generally, the volume of vegetable production decreased by 3.4 times in agricultural enterprises, by 2.4 times in farm enterprises, and by 17% in household farms. As a result, the shares of different categories of farms in total production were as follows: agricultural enterprises – 4.6%, farm enterprises – 1.3%, and household farms – 94.1% (Fig. 1).

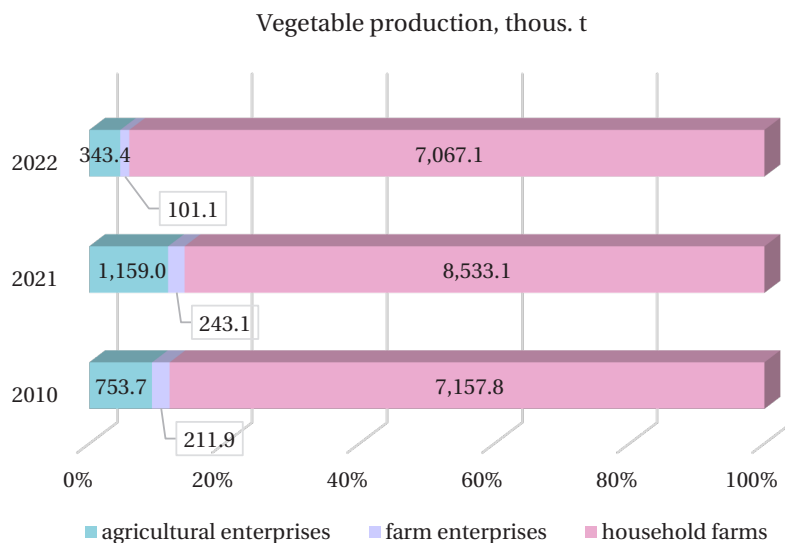


Figure 1. Production of vegetable crops in Ukraine by different categories of farms, 2010-2022

Source: built based on the data from Agriculture of Ukraine for 2022 (2023)

In the fruit and berry sector, the decline in production in 2022 was weaker than in vegetable production, as its main volumes were concentrated in areas outside the active hostilities. Gross harvest of fruits and berries totalled 1,994.8 thous. t, down 10.8% year-on-year. In

agricultural enterprises, production declined by more than 30%, and their share of the total decreased to 10.6%; in farm enterprises, the corresponding figures were 12.5% and 7.1%, while in household farms – 7.3% and 82.3% (Fig. 2).

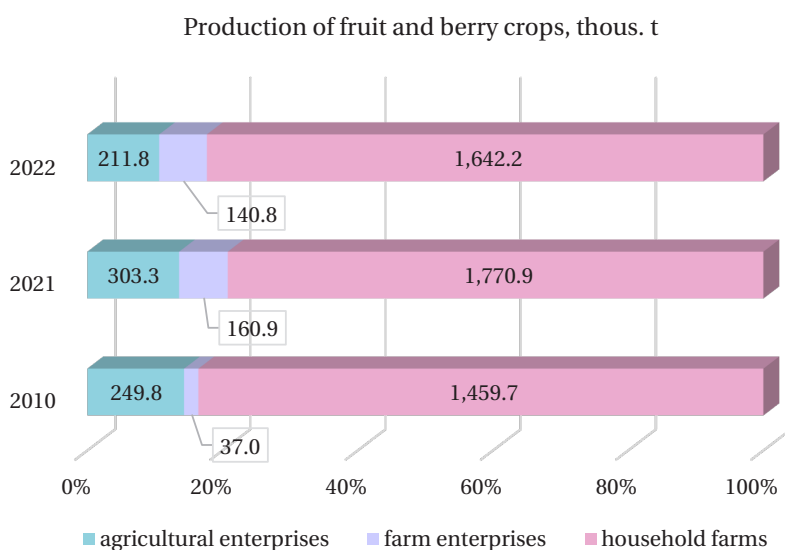


Figure 2. Production of fruit and berry crops in Ukraine by different categories of farms, 2010-2022

Source: built based on the data from Agriculture of Ukraine for 2022 (2023)

Thus, in a war situation, small producers of vegetable and fruit and berry products (farms and households) show higher resilience and, therefore, the ability to recover from damage. This strongly suggests that during the reconstruction of the national economy, pre-war production volumes in these sectors can be quickly restored and further increased thanks to the production of these products being stimulated in the household farming segment. There is a lot of evidence that farmers from the occupied territories are organising the cultivation of vegetable and fruit crops in new locations (Farmer from the Kharkiv region..., 2023; Growing watermelons in Rivne..., 2023).

Households are also increasing the area under these crops (Popp & Zavadiak, 2023; Konovalova & Melnyk, 2023), which is also facilitated by the support of international organisations (Over 40,000 households..., 2023). The Government of Ukraine provides grant support to small and medium-sized farms for the development of horticulture, berry growing, viticulture, and greenhouse farming (Grants for the development of horticulture..., 2023). According to preliminary data, as of the beginning of November 2023, the harvest of vegetable crops reached 7.1 million tonnes (This year, farmers harvested..., 2023), and therefore, the forecast of vegetable production, which is expected to

reach 99% of the previous year (Bublyk, 2023), can be considered realistic. As for fruits and berries, their supply (1.5-1.8 million tonnes) should be sufficient to meet the needs of the internal market (Ukrainian fruit continues..., 2023).

The predominance of small businesses in the production of vegetable and fruit and berry products is partly because rural and urban residents produce a certain amount of these products for their own consumption (food self-sufficiency). In 2021, the share of home-grown produce in the consumption of vegetables and gourds in rural households was almost 57% and 9% in urban households, and of fruits and berries was 32% and 4%, respectively. Under martial law, these shares have clearly increased. Therewith, calculations suggest that the difference between production and domestic consumption of vegetables and fruit and berry products in households and farms is sufficient to meet market demand for them. This demand is constrained by the low solvency of vulnerable groups. Food subsidies, combined with support for family farming, will unlock it and create reliable channels for selling farm products.

Public procurement from small producers for special needs school meals. All the world's largest school feeding programmes are based on the procurement of locally sourced food. This makes markets more predictable, helps create jobs and opportunities for children to develop lifelong preferences for fresh local produce. School meals are particularly important for children living in con-

flict zones, as they contribute to peace and social cohesion. In a country facing military action, school meals can be a major safety net, as they create a sense of normalcy and help keep children learning.

The methodological approaches to calculating the need for funds for the School Milk Programme are based on the rational norms of milk consumption in educational institutions approved by Resolution of the Cabinet of Ministers of Ukraine No. 305 (Resolution of the Cabinet of Ministers of Ukraine No. 305..., 2021), information on the number of children enrolled in educational institutions at the end of 2022 (Preschool education..., n.d.) and current information on the purchase price of milk in November 2023 (The price of extra-grade raw..., 2023). According to the norms of physiological needs, pupils of preschool educational institutions should consume 12 servings of milk per week, specifically, for children under 4 years old a portion is 150 ml, for children under 7 years old – 200 ml; students of secondary education institutions should consume 5 servings of 200 ml of milk per week. The duration of children's stay in institutions was also considered, namely, schoolchildren study 36 weeks a year, and children stay in preschool education institutions for up to 52 weeks a year. At the end of 2022, the total number of children enrolled in preschool and secondary education institutions and potentially benefiting from the programme was about 5 million people (Table 1).

Table 1. Demand for vegetables, fruits, and milk among preschool and secondary education students, 2022

Indicators	Students in preschool education institutions		Students in secondary education institutions		TOTAL
	from 1 to 4 years	4 to 6 (7) years	School age		
Number of children (persons)	247,169	687,186	4,041,976		
Portioning (units)	Number of servings per week	Weight of servings		Number of servings per week	Weight of servings
Varied, seasonal vegetables, except potatoes; fresh, frozen, or pickled	15 servings	60 g	80 g	15 servings	100 g
Annual demand (thous. t)		11.6	42.9		218.3
Varied fruit and berries, seasonal, fresh, or frozen	10 servings	60 g	80 g	10 servings	100 g
Annual demand (thous. t)		7.7	28.6		145.5
Milk and dairy products	12 servings	150 ml	200 ml	5 servings	200 ml
Demand per year (thous. t)*		23.8	88.3		149.9
					262.0

Note: *1 l of milk = 1.03 kg

Source: calculated by the authors of this study based on "The price of extra-grade raw milk has increased by 5.1%" (2023)

Thus, 262.0 thous. t of milk per year are needed to meet the physiological needs of children under 17. Based on the purchase price for milk in November 2023, which was UAH 13.92/kg, the total cost of the School Milk programme is UAH 3.7 billion per year. In the future, a healthy diet for schoolchildren may include locally grown vegetables and fruits, the consumption of which currently does not meet national recommendations for healthy nutrition. The estimated average cost of a fruit and vegetable set at current prices in November 2023 is 59.2 UAH/kg (Product prices, n.d.), which means that the amount of subsidy required is UAH 1.35 billion/month. To meet the

demand for fruit and berry consumption, UAH 0.8 billion/month is needed.

Milk production in Ukraine was constantly declining in the pre-war period, but the household sector held its leadership. In 2021, 8,713.9 thous. t of milk were produced, down 22.5% from the 2010 level (a decrease of approximately 2% per year). The share of agricultural enterprises in it was 29%, farm enterprises – 2.8%, and household farms – 68.2%. In 2022, gross production decreased to 7,767.7 thous. t, down 11% year-on-year. Therewith, agricultural enterprises produced 2,388.6 thous. t (-5.2%), farm enterprises – 255.6 thous. t (+4.8%), and household

farms – 5,123.5 thous. t (-13.8%). The ratio between these three groups of producers was 30.8%:3.3%:65.9% (Agriculture of Ukraine..., 2023). In January–November 2023, farms of all categories produced 4.6% less milk than in the corresponding period of the previous year, but the dynamics of production in business entities (agricultural and farm enterprises) was growing (+7%), and in household farms – declining (-12%). At the same time, household farms are still the main producers of milk, accounting for more than 62% of its total volume (Enterprises increased the production..., 2023). Analysts note that the decrease in milk production by agricultural enterprises and farms in the regions affected by the hostilities was partially offset by an increase in production by the same categories of farms in the central and western regions, including through the relocation of production. Milk-producing households suffered substantial losses from military aggression, as they were forced to sell or abandon their livestock when leaving their homes in the occupied territories and in the areas of active hostilities to save their lives and the lives of their children (Decline in production..., 2023).

Evaluating the above from the perspective of subsidising healthy school meals, it can be noted that despite the negative trend of declining production in the dairy industry, which has been substantially exacerbated by the war, farm enterprises and household farms are quite capable of providing the necessary amount of products. At the same time, the introduction of such a subsidy programme aimed at using the potential of small (local) producers can substantially support the establishment of an extensive network of family dairy farms in the post-war period, and participation in the programme will encourage them to apply agro-ecological practices, as the conditions of keeping and feeding cows and the quality characteristics of milk will be directly controlled by school and parental communities and local governments.

Promoting solidarity in food security at the community level. A valuable tool for improving local food security and establishing direct interaction between local producers and consumers of agri-food products in overcoming the consequences of the use of food as a weapon in Ukraine could be a model of crop sharing or agricultural production supported by consumer communities. In international practice, this model is called Community Supported Agriculture (CSA). CSA is a form of social interaction that directly connects producers and consumers in the food system, allowing consumers to subscribe to the harvest of a particular family farm or group of farms to build food security at the family and community level. It is a socio-economic model of agriculture and food distribution that allows the producer and consumer to share the risks of agricultural production for a more sustainable food supply through local markets.

Community-supported agriculture is a practice of socialisation, the management of the production and distribution of goods and services under the guidance of the community. The organisation of food supply through community complements the horizontal axis of market-mediated food production and consumption and the vertical axis of state distribution and regulation of food security. In this system, market actors interact not only and rather than as competitors, but as members of a

community who cooperate in taking collective action for the benefit of the commonwealth and each other's welfare. Examples of the use of the CSA model in the world and the prospects for its implementation in Ukraine are described in scientific publications (Overview of community..., 2016; Yarovyi & Fraier, 2019).

The provision of food subsidies to vulnerable groups can be used by recipients to support local small-scale producers and their families through CSAs. The introduction of a state programme to stimulate the creation of local CSA models as a means of multi-vector support for producers (farm enterprises and household farms), food consumers and rural communities will help to form new relationships and reliable communication between food producers and consumers based on the principles of partnership, solidarity, mutual responsibility in the production and consumption of safe and high-quality food, and the development of new behavioural strategies to achieve a new quality of life.

Notably, international studies of the cost-effectiveness of programmes such as the ones outlined above suggest that they have a multi-directional effect: they bring benefits not only to nutrition and health, but also to social protection, environmental safety, and local development. According to the UN World Food Programme (WFP), in 2023, the return on investment in school feeding programmes was USD 9 for every dollar invested in their implementation (WFP, 2023). Research by the Food and Agriculture Organization of the United Nations (FAO) confirms WFP's findings and shows that food support and school feeding programmes using local products, while requiring large public expenditures, have a multi-directional effect and considerable returns.

Programmes to support food security with a multidimensional effect are used in many countries, especially in low-income countries, and are actively supported by donor organisations, including the United States Agency for International Development, FAO, WFP, and the World Bank. The proposed approaches and estimates of the needs for funds to implement such programmes in Ukraine can serve as a basis for negotiations with these organisations to obtain additional donor funds for food aid to alleviate the suffering of the population from the aggression of the Russian Federation, which uses food as a weapon to destroy Ukrainians.

► Conclusions

The study outlined the consequences of Russia's use of food as a weapon in the war against Ukraine, covered the significance of local agri-food systems for overcoming them, and substantiates mechanisms for more comprehensive involvement of small agricultural producers in strengthening the resilience of these systems to meet the food needs of all, especially vulnerable, segments of the population.

The manifestations of Russia's use of food as a weapon in Ukraine include preventing the population's access to food and water by blocking settlements and transport infrastructure, destroying food stocks, the material base of agricultural and food producers, etc., as well as undermining the economic security of the state by preventing the export of its products. In overcoming these consequences

in the context of the war and post-war reconstruction of Ukraine, it will be essential to strengthen local agri-food systems, in which small producers – farm enterprises and household farms – should play a crucial role. This involves providing them with diversified access to internal markets by stimulating demand for their agricultural products and food.

The key ways to achieve this goal include the introduction of food subsidies for vulnerable groups of citizens to purchase the most necessary products produced by family-type farms; public procurement of products for school meals from small producers; and promotion of solidarity in food security at the community level. The calculations show that smallholder farms can produce the required products in the volumes determined for the specified needs. Strengthening local agri-food systems and supporting small-scale agricultural producers will also help to transition agriculture to an agroecological approach.

To finance programmes to overcome the consequences of the use of food as a weapon while supporting small agricultural producers, the National Bank's targeted issue with partial budgetary support can be used to strengthen the national rootedness of the agri-food

system, which involves the use of mechanisms for simultaneous and interrelated monetisation of needs and investment in the production of goods to meet these needs. Considering the multidirectional nature of the effects of such programmes and their humanitarian focus, one can also hope for donor support.

The practical significance of the findings presented in this study lies in the possibility of their use by the authorities and self-government bodies when implementing food support measures for vulnerable groups of the population and by human rights lawyers who, together with the Ukrainian prosecutor's office, are preparing documents for filing a lawsuit with the International Criminal Court regarding the use of food as a weapon by the Russian Federation. Further research could focus on improving the institutional framework for the functioning of local agri-food systems in the post-war development of Ukraine.

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► Conflict of Interest

The authors of this study declare no conflict of interest.

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Посилення ролі локальних агропродовольчих систем у подоланні наслідків використання продовольства як зброї в Україні

Олена Миколаївна Бородіна

Доктор економічних наук, професор
Інститут економіки та прогнозування Національної академії наук України
01011, вул. Панаса Мирного, 26, м. Київ, Україна
<http://orcid.org/0000-0002-9937-5907>

Ігор Васильович Прокопа

Доктор економічних наук, професор
Інститут економіки та прогнозування Національної академії наук України
01011, вул. Панаса Мирного, 26, м. Київ, Україна
<https://orcid.org/0000-0002-3681-2655>

Оксана Володимирівна Риковська

Кандидат економічних наук, старший науковий співробітник
Інститут економіки та прогнозування Національної академії наук України
01011, вул. Панаса Мирного, 26, м. Київ, Україна
<https://orcid.org/0000-0002-2723-8313>

► **Анотація.** Одним із вразливих місць України, яке висвітлює використання у російській війні проти неї продовольства як зброї, виявилась надмірна сировинно-експортна орієнтація і слабка внутрішня укоріненість агропродовольчої системи, недостатня стійкість її локальних ланок. Метою статті було обґрунтування потенціалу зміцнення локальних агропродовольчих систем через повніше залучення дрібних виробників сільськогосподарської продукції з орієнтацією на задоволення продовольчих потреб усіх верств населення. У дослідженні використані методи: системного аналізу, групування і класифікації, статистичного аналізу, формалізації, абстрактно-логічний. Розкрито прояви використання росією продовольства для досягнення політичних і воєнних цілей в Україні, роль дрібних виробників сільськогосподарської продукції в пом'якшенні їх негативних наслідків. Встановлено, що визначальним напрямом посилення стійкості агропродовольчої системи як на локальному, так і національному рівнях є надання фермерам і селянським господарствам диверсифікованого доступу на внутрішні ринки через стимулювання попиту на вироблену ними сільськогосподарську продукцію. Обґрунтовано форми реалізації цього завдання шляхом запровадження програм зв'язаних продовольчих субсидій для вразливих верств населення, державних закупівель від дрібних виробників для потреб шкільного харчування та заохочення солідарної продовольчої безпеки на рівні спільнот. Оцінено потребу в ресурсах для згаданих програм і потенціал малих господарств у виробництві необхідної продукції, показано, що запровадження програм сприятиме переходу сільського господарства до функціонування на засадах агроекології. Розкрито можливість фінансування заходів з подолання наслідків застосування продовольства як зброї з одночасною підтримкою дрібних виробників за рахунок використання цільової емісії Національного банку з частковим залученням бюджетних коштів у межах посилення національної укоріненості агропродовольчої системи, а також донорської підтримки. Практичною значимістю результатів дослідження є можливість їх використання при запровадженні заходів продовольчої підтримки вразливих груп населення та підготовці позову до Міжнародного кримінального суду щодо застосування російською федерацією продовольства як зброї у війні проти України

► **Ключові слова:** локальні агропродовольчі системи; дрібні виробники сільськогосподарської продукції; продовольчі субсидії; шкільне харчування; солідарне сільське господарство; агроекологія