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Ministry of Economy, Environment and Agriculture

**BASIC DATA COLLECTION SURVEY ON
STRENGTHENING THE AGRICULTURAL
PRODUCE VALUE CHAIN
IN UKRAINE**

FINAL REPORT

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Basic Data Collection Survey on Strengthening the Agricultural Produce Value Chain

Final Report

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List of Abbreviation

Abbreviation	Proper Name
AAP	Accountability to Affected People
ABM	Association of Milk Producers of Ukraine
BRC	British Retail Consortium
BRCGS	Brand Reputation through Compliance Global Standard
CPI	Consumer Price Index
DAAS	Dnipropetrovsk Agricultural Advisory Services
DCK	Dairy Center Kischenzi
DECIDE	Decentralization for Improved Democratic Education
DMS	Dairy Management Service
DSTU	Derzhavni Standarty Ukrainy
EBRD	European Bank for Reconstruction and Development
EPR	Extended Producer Responsibility
ERA	Extraordinary Revenue Acceleration
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDF	Family Dairy Farms
FiBL	Research Institute of Organic Agriculture
FOB	Free on Board
FSSC 22000	Food Safety System Certification 22000
FVC	Food Value Chain
G7	Group of Seven
GAC	Global Affairs Canada
GAP	Good Agricultural Practices
GI	Geographical Indications
Global G.A.P	Global Good Agricultural Practice
HACCP	Hazard Analysis and Critical Control Point
HoReCa	Hotel, Restaurant, Cafe
HS	Harmonized System
IBO	International Blueberry Organization
IFS	International Food Standard
IOM	International Organization for Migration
IoT	Internet of Things
IT	Information Technology
ITC	International Trade Centre
JICA	Japan International Cooperation Agency

KSE	Kyiv School of Economics
LADS	L'viv Agricultural Extension Services
LLC	Limited Liability Company
MAP	Modified Atmosphere Packaging
NAAS	National Academy of Agrarian Sciences of Ukraine
NGO	Non-Governmental Organization
NPO	Non-Profit Organization
NUBiP	Natural University of Life and Environmental Sciences of Ukraine
NUFT	National University of Food Technologies
ONAFI	Odessa National Academy of Food Technologies
PERAL Sumska	Promoting community-based recovery of agricultural livelihoods and strengthening of agri-food value chains in war-affected areas of Sumska Oblast
PPWR	Packaging and Packaging Waste Regulation
QFTP	Quality Food Trade Program
QMS	Quality Management System
R/D	Record of Discussions
RVO	Netherlands Enterprise Agency
SAR	State Agrarian Register
SDGs	Sustainable Development Goals
SECO	State Secretariat for Economic Affairs
SNS	Social Networking Service
SOCODEVI	Société de coopération pour le développement international
SSUFSCP	State Service of Ukraine on Food Safety and Consumer Protection
UBA	Ukrainian Berries Association
UBGA	Ukrainian Blueberry Growers Association
UCRF	Ukraine Community Recovery Fund
UDBDP	Ukraine Dairy Business Development Project
UHA	Ukrainian Horticultural Association
UN/ECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UPF	Ukraine Partnership Facility
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WFP	World Food Programme
WHO	World Health Organization

WITS	World Integrated Trade Solution
WTO	World Trade Organization

Measurement Units

Length

mm = Milimetre(s)
cm = Centimetre(s)
m = Meter(s)
km = Kilometer (s)

Extent

cm² = Square centimeter(s)
m² = Square meter(s)
km² = Square-kilometer(s)
ha = Hectare(s) (10,000 m²)

Volume

cm³ = Cubic centimeter(s)
m³ = Cubic meter(s)
L = Liter (1,000 cm³)

Weight

g = Gram (s)
kg = Kilogram(s)
ton = Metric ton(s)

Time

sec = Second(s)
min = Minute(s)
hr = Hour(s)

Others

°C = Degrees Celsius
% = Percent
MM= Man Month

Currency

JPY = Japanese Yen
UAH = Ukrainian Hryvnia
EUR = Euro
USD = US Dollar
UAH 1.0 = 0.02 EUR
(As of September 2024)

Executive Summary

The Survey aims to clarify the current situation of the food value chains for vegetables (potatoes, tomatoes, cabbage), berries (strawberries, blueberries), and milk in Ukraine, and to identify key challenges to value addition. It will collect and analyze basic information at each stage from production through processing, distribution, and marketing, and will specify issues affecting value addition, including improvements in yield and quality, promotion of processing, and expansion of market access. Building on these analyses, the Survey will propose concrete support measures, considering the applicability of Japan's technologies and know-how and potential synergies with existing JICA projects.

Summary for Vegetables (Potatoes, Tomatoes, Cabbage)

Since Russia's invasion in 2022, emigration and conscription have reduced the population, farmland and infrastructure have suffered direct damage, and ongoing disruptions have affected the entire vegetable production and distribution system. Ukraine's vegetable production is largely driven by family-run farms that prioritize self-consumption and sell surplus output (hereinafter "Households"). On the consumption side, overall vegetable intake has been trending downward due to population decline and shifts in dietary patterns. Common challenges across the value chain include lagging adoption of machinery and inputs, labor shortages, and vulnerability to climate change.

By crop, potatoes and cabbage continue to be produced in the western and central regions, where the invasion's impact has been relatively limited. Households remain the main producers and account for over 90% of total output. Key issues include delays in adopting technologies related to soil management and productivity improvement, as well as a lack of processing infrastructure among small and medium-sized agricultural business enterprises with legal status and commercial purpose (hereinafter "Enterprises")—primarily those with 250 or fewer employees and annual revenue of EUR 4,000 or less—which undermines opportunities to generate value-added at the national level. Moreover, insufficient storage and processing infrastructure leads to quality deterioration, post-harvest losses, and sharp price volatility (declines during the harvest season and spikes in the off-season), resulting in increased imports and greater instability for farm operations. On the consumption side, although overall vegetable consumption is declining, per capita consumption of potatoes is rising.

Tomatoes exhibit divergent trends between open-field and greenhouse cultivation. Open-field tomatoes have traditionally been concentrated in the south, where large Enterprises developed processing and export capacity; however, because the supply chain was concentrated in the south, it suffered severe impacts from the invasion, and efforts to establish production systems in other regions are now progressing. In contrast, greenhouse tomatoes continue to be grown in the less affected western and central regions, but high capital and operating costs make it difficult for small and medium-sized Enterprises to finance self-generation of energy and invest in cold storage and processing equipment. As a result, domestically produced tomatoes are priced at a premium, and the influx of lower-cost imports from Turkey is causing stagnation in the distribution of domestic products. In terms of

production structure, Households account for approximately 70% of total tomato output.

As forward-looking measures, achieving sustainable growth and enhancing competitiveness in Ukraine's vegetable sector will require a comprehensive push across productivity improvement, human capital development, and market expansion. To raise productivity, effective levers include support for the adoption of agricultural machinery and inputs; deployment of ICT and smart-farming technologies; dissemination of climate-resilient varieties and irrigation systems; and the development of processing and storage facilities, including cold chains. For human capital, it is important to position youth and women as core talent for business continuity and productivity, and to promote employment through technical training and management skills development. To expand sales channels, priorities include origin branding and marketing support, joint sales and price-stabilization schemes, development of new channels, and export promotion.

Policy design must be grounded in Ukraine's on-the-ground realities. In the southern regions, rehabilitating irrigation infrastructure is a critical agenda item for rebuilding the production base; however, given fiscal constraints and the risk of destruction amid ongoing conflict, large-scale infrastructure development is not feasible at this time.

Small and medium-sized Enterprises incur substantial losses at the production and storage stages. Moreover, they often struggle to meet retailers' trading requirements—such as quality specifications, lot sizes, and delivery schedules—limiting access to higher-margin channels and resulting in a predominance of direct sales at open-air markets. In principle, organizing these businesses into cooperatives to manage the value chain end-to-end, while investing in and sharing common facilities, would be expected to improve trading terms and broaden market access. In practice, however, due to historical, cultural, and institutional factors in Ukraine—including low trust in cooperatives and weak incentives to participate—this model has not functioned effectively.

Accordingly, promoting contract farming is vital as a new mechanism to strengthen the value chain. Under contract farming, producers and buyers (such as processors and retailers) agree on transaction terms in advance, enabling stable trading relationships. In addition, to secure consistent quality, buyers can help raise baseline standards by providing cultivation guidance and production-management know-how, and by supplying or facilitating shared use of inputs and equipment. This approach mitigates price-volatility and market-access risks and contributes to income stabilization. Given the difficulty of operationalizing the cooperative model in Ukraine, leveraging existing contract-farming arrangements and retail channels to integrate Small and medium-sized Enterprises into the value chain is an effective course of action.

Considering the background and the criteria of relevance, effectiveness, and sustainability, the following three support measures are proposed for JICA implementation.

1. Additional Financial Support for the Government of Ukraine's Storage Facility Grant Program (Japanese ODA Loan)

A shortage of modern storage facilities is a bottleneck in the potato and cabbage value chains, and small and medium Enterprises face challenges in self-financing due to high upfront costs, tight financing conditions, and fiscal constraints. It is proposed that eligible companies under the Government's grant program, planned from April 2026 onward, receive support conditional upon establishing contract-farming linkages with Enterprises operating on at least 1 ha of land. Expected outcomes include accelerated development of modern storage and processing facilities, reduced post-harvest losses, stabilization of market prices, and a more predictable market environment for producers and consumers. In addition, dissemination of contract farming as described in the second and third measures would promote inclusion of small and medium Enterprises in value chains and stabilize quality and market channels.

2. Support for Establishing a Fresh Produce Contract Farming Model (Grant Aid, Private Sector Investment Finance [PSIF] or Technical Cooperation Project)

In Ukraine's agricultural value chains, the requirements of major retailers (quality, lot size, delivery) and gaps in washing, sorting, and packing facilities, as well as insufficient human resource development and quality assurance systems, pose entry barriers for farmers and small and medium Enterprises. Many producers consequently rely on informal markets, making stable transactions and income difficult to secure. To address this, the model would focus on leader farmers (medium-sized Enterprises) seeking direct sales to large retailers, introducing washing, sorting, and packing equipment through Grant Aid or PSIF, and aggregating and standardizing fresh produce from small Enterprises to expand stable and favorable retail channels via contract farming. Complementary Technical Cooperation would provide vocational training on contract farming for small Enterprises and support matching with leader farmers, thereby improving quality and stabilizing incomes.

3. Support for the Expansion of Processed Product Contract Farming Models (PSIF)

Ukraine's potato processing rate is approximately 3-5%, markedly lower than the EU's rate of over 93%, indicating substantial potential for value addition. Small Enterprises have struggled to introduce modern agricultural machinery, irrigation equipment, and storage facilities due to funding constraints, slowing improvements in productivity and quality and leaving them reliant on direct sales of fresh produce. By deploying PSIF to growth-oriented processors to introduce new processing lines and expand networks of contract farmers, the initiative aims to stabilize incomes for small Enterprises, raise the processing rate and generate value addition, and strengthen the export competitiveness of processed products.

Summary for Berries (Strawberries, Blueberries)

Berry production has traditionally been strong in Ukraine, with the western and west-central regions serving as the primary production areas. The Ukrainian government promotes berry cultivation as part of its agricultural diversification policy, and the main crops are strawberries, raspberries, and—more recently—blueberries, whose production has expanded rapidly. Clear differences are evident in the

production structures and challenges for each crop.

Strawberries are produced mainly by Households, but both production volume and planted area are on a declining trend, and consumption is largely domestic. Key value-chain issues hindering productivity and profitability include short-term, profit-focused production management practices, vulnerability to climate change risks, and underdeveloped quality management systems.

Priority measures for strawberries include technical guidance on protected cultivation and crop planning, dissemination of climate risk mitigation technologies, technical training and support for the adoption of small-scale machinery for new entrants including women, dissemination of quality management techniques, support for obtaining international certifications, and development of export channels.

Blueberries are predominantly produced by medium- and large-scale, export-oriented Enterprises, and both planted area and output increased substantially between 2018 and 2023. However, because it takes three to four years from planting to achieve stable yields, current yield per unit area remains low. Yields are below the international average not only for this reason but also due to underdeveloped cultivation techniques, a shortage of agronomists overseeing production management, and the need to address climate risks such as frost damage. In addition, gaps in post-harvest quality management infrastructure—such as grading, packing, and pre-cooling—and in the cold chain, as well as insufficient market access to absorb rising volumes, constrain export growth. The costs of obtaining and maintaining international certifications (e.g., GLOBALG.A.P.) and labor shortages also pose significant management challenges.

Recommended measures for blueberries include on-site technical guidance on cultivation, support for introducing frost-protection equipment and irrigation systems, training and development of agronomists, wider deployment of cooling equipment and sorting lines, promotion of group certification schemes, support for expanding sales channels, and brand building and differentiation strategies.

1. Project for Strengthening Production Technology and Promoting Exports of Berry (Technical Cooperation Project)

This measure targets blueberry producers and related enterprises in Ukraine and aims to strengthen production technologies and support export promotion to enhance competitiveness in international markets. As noted above, blueberry production faces immature production techniques and shortages of agronomists responsible for production management, and certification compliance and market development are central challenges for export promotion. Productivity and quality will be improved by strengthening agronomist training and technical extension through academic institutions and vocational schools. In collaboration with the Ukrainian Berry Association (UBA) and the Ukrainian Blueberry Growers Association (UBGA), support will be provided for obtaining GLOBALG.A.P. and organic certifications, expanding market access primarily to the EU and to non-EU markets, and facilitating export promotion. The intended outcomes are improved yield and quality, strengthened competitiveness

through international certification, and increased export volumes.

2. Two-Step Loan Project for Strengthening Climate Risk Countermeasures (Japanese ODA Loan)

This measure targets the agricultural sector, with a focus on blueberry and strawberry producers, and supports capital investment to mitigate frost damage and expand cultivation of higher-value crops, thereby establishing a more sustainable production system. Addressing climate risks including frost is an urgent priority, and financing needs for equipment investment are significant. Through the Government of Ukraine, JICA would extend an ODA loan in a two-step loan modality. Designated financial institutions would on-lend to producers for the introduction of frost-protection equipment, greenhouse facilities, processing equipment, and related investments. Complementary activities, including technical guidance and capacity development, assistance to obtain international certifications, and support for market development, will be implemented in tandem to strengthen resilience to climate risks and expand production and exports of high-value crops.

In addition to commodity-specific measures, sustainable development and stronger inclusion in Ukrainian agriculture require cross-cutting interventions across vegetables and berries. Common challenges include shortages of inputs and equipment and gaps in technical knowledge that hinder improvements in cultivation practices. The following measures are proposed.

1. Project on Promotion of Small-Scale Horticultural Agriculture: Enhancing Inclusiveness of Women Farmers (Phase 2) (Technical Cooperation Project and Grant Aid)

Building on the results of JICA's previous support to women farmers, this phase will systematize manuals, expand target institutions and regions, and upgrade trainer development programs. In the vegetable subsector, key gaps include access to inputs and equipment, soil and irrigation management, pest and disease control, and insufficient storage facilities. In the berry subsector, priority needs include climate adaptation, protected cultivation techniques, and stronger marketing capabilities.

Phase 2 will combine Grant Aid and Technical Cooperation. First, Grant Aid will provide equipment and materials to vocational schools and government training institutions and promote their use by farmers through trial applications. As a pilot, the project conducted technical training for women farmers and small-scale farmers at five vocational schools in Ukraine. Subsequent activities under Technical Cooperation will support self-reliant operations at those institutions and horizontal scaling to additional institutions. These efforts are expected to strengthen technical, managerial, and market development capacities among small-scale and women farmers and enhance inclusion and sustainability in the agricultural sector.

2. Technology Demonstration and Dissemination Project through Governmental Research Institutions (Technical Cooperation Project)

This measure will assess the local applicability of advanced Japanese agricultural technologies, inputs, and equipment and develop practical models for introducing technologies that address production constraints in vegetables and berries, including yield and quality improvement, climate change

adaptation, and stabilization of farm management.

Through on-farm demonstrations and performance testing, validation of climate-resilient technologies, and local evaluation of new seeds and inputs, the measure will promote evidence-based dissemination. The knowledge generated will be shared widely through vocational schools and producer networks to accelerate adoption and institutionalization in the field. Expected outcomes include the establishment of sustainable production systems resilient to climate risks, stabilization of farm incomes, and revitalization of local economies.

Summary for Milk

Ukraine's dairy industry is currently undergoing a major transition in its production structure. Household farmers, which used to play a central role in the production of raw milk for dairy processing, have been experiencing a decline in raw milk production due to worsening profitability caused by soaring fuel and feed prices. As a result, in recent years, the production volume of Enterprise farms has exceeded that of Household farms, and it is expected that the system in which Enterprise farms become the mainstay of production will be established in the future.

Constraints affecting profitability and raw milk quality differ by the destination of supply among enterprise farms. For enterprise farms supplying large dairy processors that operate nationwide, mid-sized farms with herds of fewer than 400 head tend to have low profitability because economies of scale are not fully realized. Many such farms do not reach break-even. This reflects the strong economies of scale in dairy production and the recent increases in energy and feed costs that have compressed margins.

For small and medium enterprise farms supplying regionally focused mid-sized processors, challenges include the continued use of aging facilities and equipment dating from the Soviet era, inadequate cooling and sanitary management equipment, limited know-how for storage and quality control, and lower raw milk quality linked to deteriorated feed balance due to logistics constraints. Low profitability driven by higher fuel and feed prices is also a serious concern.

In the value chain for distribution and processing, processors procure raw milk mainly from enterprise farms. Milk produced by household farms often does not meet quality standards and is used for on-farm consumption or sold in limited quantities in local retail.

Moreover, the worsening labor shortage—driven by youth disengagement from agriculture, military mobilization, and overseas migration—has become a cross-cutting, industry-wide challenge for both farmers and dairy processors. Dairy farming is labor-intensive across many processes, including milking and herd management, and many small and medium-scale farms in Ukraine remain insufficiently mechanized. Combined with the previously noted constraints on equipment investment, technical know-how, and feed availability, chronic labor shortages are contributing to stagnant raw milk production and declining quality.

To achieve sustainable growth and strengthen competitiveness, it is necessary to promote productivity

improvement, quality enhancement, operational efficiency, and human resource development in an integrated manner. Strengthening the management base of mid-sized and small and medium enterprise farms, replacing aging equipment, introducing energy-saving technologies, and establishing quality management systems are urgent. Given the worsening labor shortage, it is important to raise productivity and efficiency with limited staff by disseminating practical expertise and strengthening on-site human resources. Addressing these challenges requires the introduction of advanced knowledge and technologies from inside and outside the country, measures to reduce initial investment burdens, and support that is tailored to local conditions.

Based on the above background, the following measures are proposed as support measures by JICA.

1. Support for Medium-Scale Enterprise Farms with Fewer Than 400 Cows (Technical Cooperation Project and Grant Aid)

This measure targets mid-sized enterprise farms that supply large dairy processors and aims to transfer know-how from high-productivity, high-profit large farms in Japan through Technical Cooperation, while promoting the introduction of energy-saving and efficiency-enhancing technologies through Grant Aid. As noted above, profitability at these farms is low due to strong economies of scale in dairy production and recent increases in energy and feed costs. Under Technical Cooperation, local trainers and specialists will receive training and guidance on production management efficiency, measures to improve profitability, and energy and environmental management, so that farms can autonomously improve productivity. Under Grant Aid, energy-saving equipment, automation devices, barn environment control technologies, and by-product treatment technologies will be leased or lent via associations to reduce initial investment burdens and support sustained management improvement. The expected result is simultaneous efficiency gains and energy savings, leading to higher productivity and profitability at mid-sized enterprise farms with fewer than 400 head.

2. Support for Small and Medium-Scale Enterprise Farms (Technical Cooperation Project and Grant Aid)

This measure targets small and medium enterprise farms that supply regionally focused processors and aims to transfer Japanese know-how on feed and ration design, quality and hygiene management, and husbandry and health management through Technical Cooperation, while promoting the introduction of technologies that improve raw milk quality and productivity through Grant Aid. As noted above, low raw milk quality stems from obsolete facilities, insufficient management systems and know-how, and deteriorated feed balance. Under Technical Cooperation, local trainers and experts will be trained to disseminate knowledge on feed and ration design, quality and hygiene management, and husbandry and health management to farmers. Under Grant Aid, balanced feed, milk testing and analysis equipment, energy-saving equipment, and water treatment facilities will be leased or lent through clusters that bring together associations, academic institutions, and veterinarians, thereby reducing farmers' upfront costs. The expected result is improved raw milk quality and productivity at small and medium enterprise farms, contributing to higher quality and competitiveness across the value chain.

3. Support for Human Resource Development in the Dairy Industry (Technical Cooperation Project)

This measure will use national academic institutions, including agricultural universities, and vocational schools as anchor institutions to develop human resources for both dairy farms and processors and to facilitate appropriate deployment to the field. As noted above, labor shortages driven by youth exit, mobilization, and out-migration are a sector-wide challenge. Through local trainers, the measure will develop farm and processor personnel and promote the placement and retention of specialists. For processors, knowledge will be shared on milk quality control and food safety and on the operation of energy-saving equipment to strengthen on-site capacity and quality assurance systems. These efforts aim to strengthen human resources and competitiveness across the value chain and to build a foundation for the sustainable development of Ukraine's dairy sector.

Summary for Milk Pilot Project

In 2025, in response to a support request from dairy farmers in Boryspil, Kyiv Oblast, the Union of Dairy Enterprises of Ukraine, the National University of Life and Environmental Sciences of Ukraine (NUBiP), Swisscontact, and the Veterinary Alliance of Ukraine established the Agro-Food Consulting Agency. This "Milk Pilot Project" seeks to partner with the Agency to support small and medium-scale Enterprise dairy farms through Japanese technology and human resource development. Boryspil is one of the oblast's major livestock production centers. In the district, 23 enterprise dairy farms keep approximately 15,000 dairy cows, of which about 1,600 are kept by small- and medium-scale dairy farms with fewer than 400 head, the target beneficiaries of this project. While milk supply for school meal programs has been realized, local production for local consumption has not yet been achieved; to make this a reality, small and medium-scale farms that supply raw milk to regional small and mid-sized dairy processors will play a critical role. Among small Enterprise farms with fewer than 100 head, key challenges include poor feed balance, inadequate hygiene management, and underinvestment in core facilities such as barns and milking equipment. As a result, raw milk grades remain at "First," which falls short of EU standards. Consequently, farms struggle to meet the price and quality requirements for supplying processors serving school meal programs, making market entry difficult. By contrast, many medium-scale Enterprise farms with 100 to fewer than 400 head have achieved "Extra" grade and have made progress in hygiene, feeding, and data management, but still face challenges in alleviating labor shortages and further improving production efficiency.

The objective of this project is to improve raw milk quality at small and medium-scale farms and address the shortage of skilled personnel by identifying technologies conducive to clustering and raising the overall level of knowledge. Here, "cluster" refers to a system in which dairy farmers and related organizations collaborate to achieve high-profit, high-quality dairy production at the regional level. Because small and medium-scale dairy farms find it difficult to resolve issues on their own, the aim is to address them through clustering. Specifically: (1) through technology validation for clustering, match Japanese technologies to the challenges of small and medium-scale farms, verify applicability, and identify effective solutions; and (2) through workshops for skills development, conducted with

educational institutions, experts, and partner farms in both Japan and Ukraine, assess supportable training domains centered on Japanese expertise. The implementation process and outcomes of (1) and (2) are organized below, with implications for future scale-up.

1. Technical Validation toward Cluster Formation

The results of the technology validation and proposed implementation approaches are as follows. Five technologies were evaluated for alignment with local needs: (i) Kohshin Engineering's composting systems to address soaring chemical fertilizer prices and declining farm profitability; (ii) Desamis's monitoring sensors to overcome the growing difficulty of precise, cow-by-cow management under severe labor shortages; (iii) Panasonic Environmental Systems & Engineering's next-generation closed-barn system to reduce stress from winter cold and summer heat and to improve in-barn hygiene; (iv) Enzyme's humic amendments to improve water quality issues associated with groundwater use; and (v) Ajinomoto's amino acid-balanced feed to counter rising costs of feed additives and overall feed. The highest priorities are (i) composting systems and (iii) the closed-barn system. Composting can reduce costs amid high fertilizer prices and increase yields of feed and crops, with strong economics at scales of roughly 1,000 head and above. A viable introduction model is a regional circular scheme that aggregates manure from multiple farms, composts it, and redistributes it, enabling broad spillover benefits to small farms and contributing to a cluster focused on high-profit, high-quality dairy production. In addition, the potential to monetize GHG reductions through international certification can support investment recovery. At the same time, success requires clarifying prerequisites, including selection of host sites, engagement of small and medium-scale farms, and permitting.

The closed-barn system aligns with animal welfare standards coming into force in 2026, manages heat and cold stress and air quality year-round to reduce transition-period diseases, and stabilizes milk quality. It allows phased introduction from small scale and fits local free-stall housing practices. Coupled with Japanese manufacturers' quality and maintenance frameworks, incremental expansion from partial deployment offers attractive cost-effectiveness. Desamis's U-motion can enhance reproduction and disease management under labor constraints; however, Western competitors are ahead, so differentiation and a compelling pricing strategy will be critical for broader adoption. The effects of Enzyme's humic amendments on drinking water quality are unstable in cold seasons, making entry via odor-control applications in composting the more realistic starting point. Ajinomoto's amino acid-balanced feed can reduce costs and environmental load where crude-protein (CP) formulation can be optimized, but farm-specific formulation validation is a prerequisite.

Based on these findings, two composting-centered cluster implementation models were designed for Boryspil. First, a city-run manure treatment facility-centric model (with equipment leased using grant aid), under which the municipal facility centralizes collection, composting, and redistribution, with priority benefits returned to small and medium-scale farms. Second, a large-dairy-centric model within the city (introduced through overseas investment and financing), under which a large farm serves as the hub for collection, composting, and redistribution, allocating compost to small and medium-scale farms.

In both models, success will hinge on governance design for participation requirements, cost sharing, benefit allocation, and quality standards; integration of collection radius, frequency, and logistics; optimization of composting processes; and establishment of a measurement, reporting, and verification (MRV) system for cash flows and credit revenues. From a market perspective, expanded EU tariff-rate quotas and rising dairy exports are increasing demand for high-quality raw milk, while national strategies to promote sustainability in anticipation of EU integration provide tailwinds that support adoption.

2. Workshops for Developing Skilled Personnel

For human resource development—given gaps between educational supply and on-the-ground skills and personnel shortages stemming from conscription and regional infrastructure constraints—workshops were held linking universities, associations, and farms. Specifically, to address the fact that small and medium-scale dairy farms fail to meet national hygiene management standards due to shortages of labor, funding, and equipment, Professor Makita of Rakuno Gakuen University delivered a lecture on hygiene management and presented a comprehensive support case for Ugandan smallholder dairy farmers focused on productivity and milk quality improvement, hygiene and animal health management, and human resource development. To counter the prevalence of peripartum diseases at Ukrainian small and medium-scale farms, Professor Noguchi of Tokyo University of Agriculture proposed feed formulations to prevent and reduce such diseases. Furthermore, to address stagnant milk yields and high morbidity due to poor nutritional balance, Professor Hanada of Obihiro University of Agriculture and Veterinary Medicine presented methods to improve nutritional balance under constrained feed conditions and outlined an approach to optimizing rations using locally available inputs. In addition, in view of the difficulty of securing veterinarians amid labor shortages and the widespread reliance on visual observation for health management, Professor Otsuka of Obihiro University lectured on dairy cow health and productivity enhancement, covering the standardization of observation indicators and practical methods for daily implementation. These efforts shared implementable, field-appropriate knowledge and helped narrow skills gaps, and the content is expected to be disseminated to farmers through the Agro-Food Consulting Agency.

At present, Ukraine has no public human resource development programs tailored to small and medium-scale dairy farms. To fill this gap, organizations such as Swisscontact and the German government are providing training, and the workshops confirmed strong demand for a comparable, comprehensive program from Japan. Furthermore, due to regulatory amendments, training conducted by the Union of Dairy Enterprises of Ukraine can now be recognized as formal vocational development. Accordingly, an approach that combines Japanese expertise through a collaborative framework with the Agro-Food Consulting Agency is considered feasible and promising.

In summary, this pilot project (1) identified priority technologies for clustering (composting systems and closed barns), specified introduction models and implementation requirements, and (2) validated areas where Japan can support the Agro-Food Consulting Agency through skills-development

workshops, providing missing know-how to strengthen capabilities and thereby advancing support for a regional dairy cluster. As a result, the foundations have been laid to improve milk quality and productivity, reduce costs for small and medium-scale farms, and enable stable supply to the EU market and to school meal programs, charting a clear path toward a sustainable dairy cluster in Boryspil. Moreover, by going beyond simple knowledge transfer and examining combinations with Japan's priority technologies, the project has enhanced prospects for scaling into a systematic support program that integrates technology deployment with human capital development.

CHAPTER1 OUTLINE OF THE SURVEY

1.1 Background

Agriculture in Ukraine is centered on grain production such as wheat and maize and is a core sector that accounts for around 17.6 % of gross domestic product, about 20 % of the labor force, and approximately 40 % of exports. Accordingly, the recovery and development of the agricultural sector is positioned as a central pillar and indispensable element in the country's economic recovery plans. The importance of horticulture and dairy is increasing within the sector. Compared with grains, these subsectors are more labor intensive and can generate higher value added through processing and distribution, thereby contributing to local employment and income, strengthening food security, and promoting the participation of small and medium enterprises. For these reasons, this survey focuses on horticulture and dairy, where export expansion and upgrading of the domestic market are expected.

In horticulture, households produce about 94 % of vegetables and 82 % of fruits, primarily for self-consumption, while enterprises are responsible for production destined for domestic and international distribution. The roles of households and enterprises are clearly delineated. Ukraine's agricultural value chains are also polarized by scale. Large enterprises use modern equipment and distribution networks to establish efficient supply systems for formal markets and exports. In contrast, traditional structures led by small enterprises and households rely on manual production and harvesting, and marketing outlets are mainly local markets and open-air markets. Access to processing and formal markets is limited. Low productivity and restricted market channels inherent in traditional structures, combined with extreme weather, surging input prices, infrastructure damage, and labor shortages, make it difficult to raise value across the food value chain.

Similarly, the dairy sector, which produces approximately 7.3 million tons of raw milk annually and is indispensable to domestic food supply, faces challenges such as declining dairy cattle numbers due to higher feed and energy prices and difficulties in maintaining the cold chain. Considering these conditions, strengthening resilience across the agricultural sector with a focus on horticulture and dairy and supporting its sustainable development are critical to achieving Ukraine's economic recovery.

1.2 Objectives

This survey targets the food value chains of major horticultural crops and raw milk in Ukraine and aims to analyze their current situation and challenges. Specifically, for vegetables (potatoes, tomatoes, cabbage), berries (blueberries, strawberries), and raw milk, the survey will collect and analyze basic information at each stage from production through processing to distribution. This will clarify the roles and the constraints faced by producers by scale, including large enterprises, small and medium enterprises, and households. Based on these analyses, the survey will propose concrete support measures that indicate the direction of future cooperation, considering the applicability of Japanese technologies and know-how and potential synergies with existing JICA projects.

1.3 Survey Implementation Structure

This survey is implemented by Deloitte Tohmatsu LLC. Considering travel restrictions arising from the current situation in Ukraine, the survey team has established a framework for close collaboration with Deloitte Ukraine, the Deloitte Group's local affiliate, for effective execution.

1.4 Survey Itinerary and Key Informants

The work process for this survey consists of domestic preparatory work and on-site missions. The survey comprised desk work and two field missions. Initial information was collected by Deloitte Ukraine through proxy interviews and online tools in view of travel restrictions.

Field missions were conducted in mid-September and mid-October 2025. The first mission briefed the Government of Ukraine and the Embassy of Japan and examined issues in the raw milk value chain through visits and interviews with industry associations and large and medium producers and processors. The second mission focused on vegetables and berries and included visits to large enterprises and small and medium enterprises, cooperative founders, and local governments; the team also reviewed the handling of Ukrainian products in Polish retail outlets and markets.

An online seminar for Ukrainian stakeholders was held in late January 2026 with simultaneous interpretation, bringing together relevant ministries, producers and processors, industry associations, donors, education and training institutions, and the Embassy of Japan, with about 80 participants, to align understanding of key challenges and discuss a coordination framework and next steps. In February 2026, an online seminar for Japanese companies summarized value chain conditions and shared entry-relevant information, including trends, bottlenecks to value addition, and functional requirements for Japanese technologies and services.

Based on the research conducted to date, it has become clear that improving productivity and strengthening competitiveness in Ukraine's dairy sector will hinge particularly on enhancing product quality among small and medium-scale farms and on human capital development. In response, the Milk Pilot Project launched in December 2025 conducted two rounds each of technology validation for clustering and workshops for skills development, with the aim of strengthening the capabilities of the cluster provider, the Agro-Food Consulting Agency. In the technology validation, following technical briefings by five Japanese companies offering solutions to challenges faced by Ukraine's small and medium-scale dairy farms, members of the Agro-Food Consulting Agency—the Union of Dairy Enterprises of Ukraine, the National University of Life and Environmental Sciences of Ukraine (NUBiP), Swisscontact, and the Veterinary Alliance of Ukraine—together with Ukrainian small and medium-scale dairy farmers, discussed needs and applicability of the proposed technologies. In the skills-development workshops, to address knowledge gaps on the cluster provider's side, four Japanese university professors delivered lectures and, together with the Agency's members and Ukrainian small and medium-scale dairy farmers, assessed training domains in which Japan can provide support.

Within the Government of Ukraine, the main liaison and coordination points for vegetables, berries, and dairy are the Department of Rural Development and the Department of Agrarian Development. For initial coordination on JICA cooperation, the first point of contact is the Unit for Attracting Support to the Agrarian Sector under the Department of Rural Development. Where detailed technical discussions are required, it is effective to proceed in coordination with the relevant divisions of the Department of Agrarian Development.

Table 1.4.1 Work Schedule of the Survey

Activities		Period																
		FY2025																
		4	5	6	7	8	9	10	11	12	1	2	3	4	5			
Report Preparation	1) Inception Report	■	△Within 10 business days of contract signing															
	2) Interim Report					■	■	■	△September 12th									
	3) Draft Final Report									■	■	△January 9th						
	4) Seminars										■	■						
	5) Final Report											■	■	△February 13th				
Market analysis	1) Survey of other donors' support		■															
	2) Survey of the Ukrainian government strategy		■							■								
	3) Survey of agriculture and livestock in Ukraine		■	■						■								
	4) Polish market research									■								
	5) Ukraine market forecast							■	■									
Survey of targeted vegetables	1) Stakeholder analysis			■	■													
	2) FVC analysis			■	■	■	■			■								
	3) Interview (by Deloitte Ukraine)					■	■	■	■	■	■	■						
	4) Summary of interviews									■	■							
	5) Examination of supporting measures									■	■	■						
Survey of targeted berries	1) Stakeholder analysis			■	■													
	2) FVC analysis			■	■	■	■			■								
	3) Interview (by Deloitte Ukraine)					■	■	■	■	■	■	■						
	4) Summary of interviews									■	■							
	5) Examination of supporting measures									■	■	■						
Survey of milk	1) Stakeholder analysis			■	■													
	2) FVC analysis			■	■	■	■			■								
	3) Interview (by Deloitte Ukraine)					■	■	■	■	■	■	■						
	4) Summary of interviews									■	■							
	5) Examination of supporting measures									■	■	■						
	6) Milk Pilot Project										■	■	■	■	■	■	■	△April 30th

Legend: ■ Working Period (Domestic) ■ Working Period (Local) (△ Submission of Reports, etc.)

Source: JICA survey team. *Note: Following the recent amendments to the contract, the scope of work has been revised to include the preparation of Draft Final Report (2nd), the extension of the deadline for the Final Report, and the addition of the Pilot Project, with these changes to be reflected in the Final Report.*

1.5 Scope of the Survey

This survey will collect and analyze baseline information and challenges at each stage of the food value chain for six target commodities: potatoes, tomatoes, cabbage, blueberries, strawberries, and milk. This will be accomplished through a literature review and interviews with local stakeholders. With the cooperation of industry bodies and associations, the overall structure of agricultural producers was identified, and conditions were examined by producer scale. For milk, the survey also analyzed the status and challenges of the supply system for school meals. Milk supply to school meals is one indicator of a stable domestic system for high quality raw milk and is directly linked to the development of the regional dairy industry and improvements in children's nutrition. Based on these findings, the team examined how Japanese technologies and know-how could be applied and provided concrete recommendations on the direction of future cooperation by JICA.

Furthermore, in the dairy sector, as the challenges faced by small and medium-scale farms and the shortage of skilled personnel emerged as critical issues, the Milk Pilot Project was implemented to

strengthen the capabilities of the cluster provider, the Agro-Food Consulting Agency. As part of this project, the technology identification for clustering matched Japanese technologies to the challenges of small and medium-scale dairy farms, verified their applicability, and identified promising options. In addition, skills-development workshops assessed training domains in which Japan can provide support.

CHAPTER2 VEGETABLE VALUE CHAIN

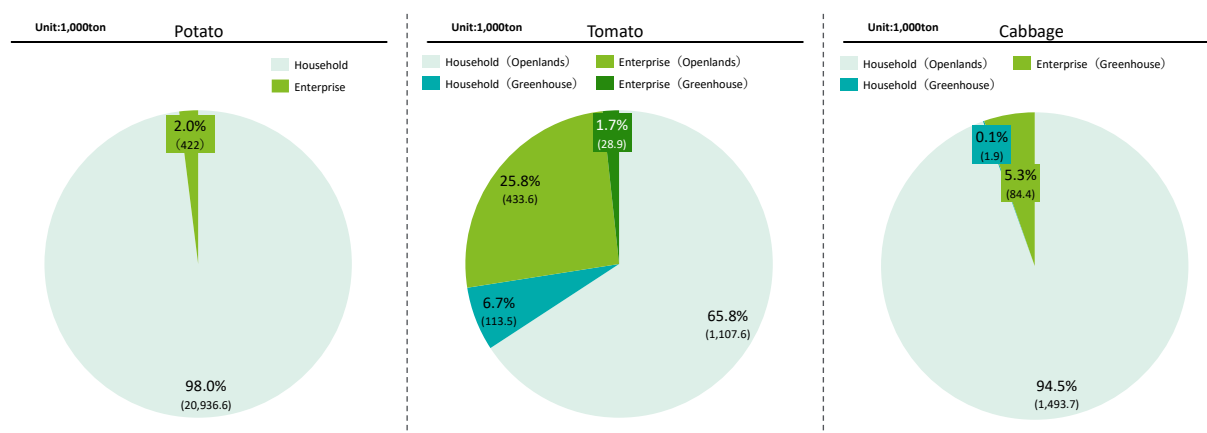
2.1 Overview

2.1.1 Production

(1) Breakdown of Production by Producer Type for Potatoes, Tomatoes, and Cabbage

According to the State Statistics Service of Ukraine, the production structure for the country's major vegetables—potatoes, tomatoes, and cabbage—varies significantly depending on the type of producer. The 2023 data indicates that potatoes (with a total production of approximately 21.36 million tons) and cabbage (approximately 1.58 million tons) are predominantly produced by households, which account for 98% and 95% of the total share, respectively. In contrast, enterprises contribute approximately 27% to the total production of tomatoes (approximately 1.68 million tons), suggesting that commercial production is carried out on a more significant scale for this crop compared to the other major vegetables.

Furthermore, greenhouse cultivation is a notable feature in tomato production. Based on the 2023 data, 8.4% of the total production volume, equivalent to approximately 142,000 tons, comes from greenhouse cultivation. In the case of cabbage, this cultivation method is primarily conducted by households, but its proportion is minimal, representing only about 0.1% (approximately 1,900 tons) of the total output. No data on the greenhouse cultivation of cabbage by enterprises was available from the State Statistics Service.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

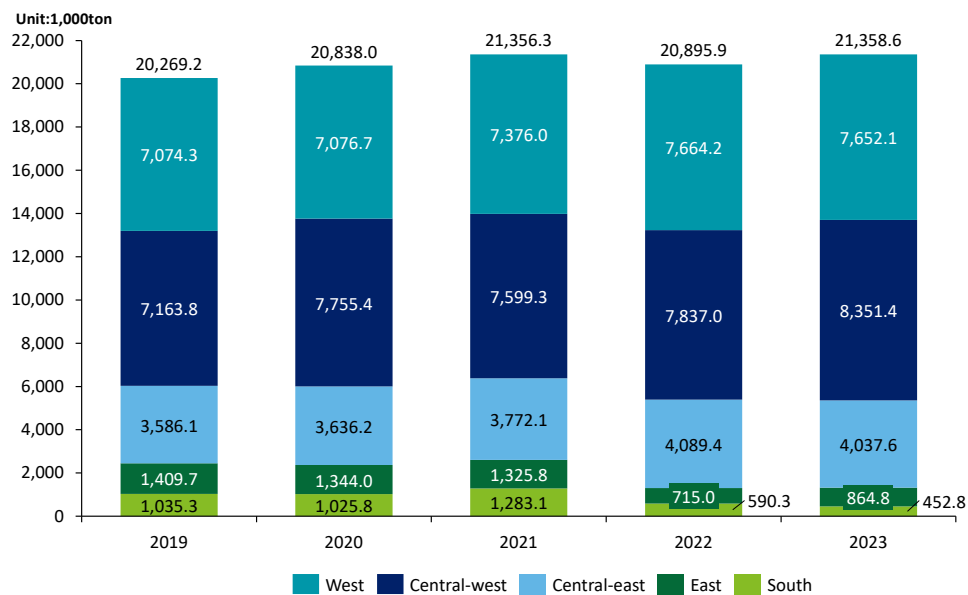
Figure 2.1.1 Production Profile by Producer Type (2023)

(2) Potatoes

1) Trends in Potato Production in Ukraine

The production trend for potatoes in Ukraine shows that the total output reached approximately 21.36 million tons in 2023, maintaining a stable level compared to 2021 for the country as a whole. However, a regional analysis of this figure reveals a notable shift in production bases. Specifically, while production in the southern regions has decreased, it has increased in the main production areas of the western and west-central regions. This suggests that the country's production geography has been altered

by the Russian invasion.

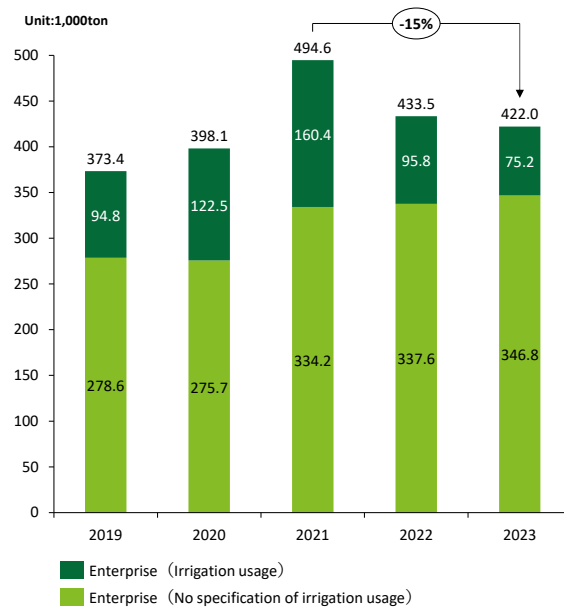


Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 2.1.2 Trends in Potato Production Volume

2) Trends for Enterprises

Potato production by enterprises has been on a downward trend in recent years. The output, which was approximately 495,000 tons in 2021, decreased to approximately 422,000 tons by 2023. This decline is attributed to several factors, including changes in yield due to climate change, labor shortages resulting from the invasion, and damage to production infrastructure, particularly the destruction of irrigation systems in the southern regions. Production volume from irrigated land was halved, falling from approximately 160,000 tons in 2021 to around 75,000 tons in 2023, posing a significant challenge to the stable supply of potatoes from enterprises.

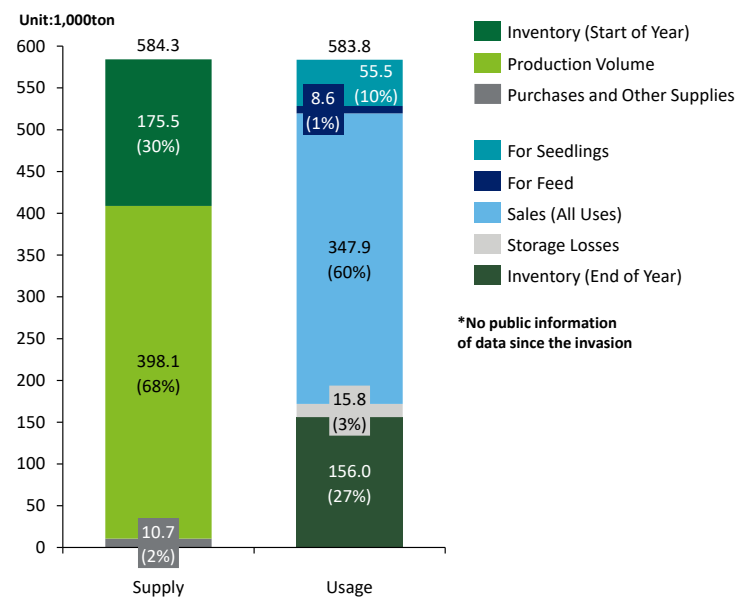


Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 2.1.3 Trends in Potato Production Volume by Enterprises

Furthermore, an examination of the supply and demand structure for domestically distributed potatoes in 2021 (which is assumed to be dominated by enterprises) shows that of the total supply of approximately 584,000 tons, about 70% was from the current year's production, while around 30% consisted of carry-over stock from the previous year. On the demand side, sales accounted for approximately 60% (348,000 tons), while seed potatoes for the next planting season made up about 10%, and year-end inventory constituted roughly 30%. Additionally, post-harvest losses during storage amounted to approximately 3% (16,000 tons), suggesting a need for improvement in post-harvest handling and storage technologies¹.

¹ Немець, Л., Кобилін, П., Телебенева, Є. “Територіальні особливості ринку картоплі в Україні”. Часопис соціально-економічної географії, 36, 26-35, 2024-05-30. <https://doi.org/10.26565/2076-1333-2024-36-02>, (Accessed 2025-05-23).



Source: JICA survey team based on Людмила Немець, Павло Кобилін, Євгенія Телебенєва “Територіальні особливості ринку картоплі в Україні” (<https://doi.org/10.26565/2076-1333-2024-36-02>)

Figure 2.1.4 Domestic Supply and Usage Balance of Potatoes (2021)

A regional review of potato production trends confirms significant shifts in the country's production bases. While production has notably increased in Lviv oblast in the west, it has sharply decreased in Mykolaiv oblast in the south as of 2023, indicating a westward shift of production centers. For Kherson, Zaporizhzhia, Luhansk, and Donetsk oblasts, which are severely affected by the invasion, production statistics themselves have not been available since 2022, underscoring the severe disruption to agricultural activities in these regions.

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Table 2.1.1 Trends in Regional Potato Production by Enterprises (Utilizing Irrigation Systems within Open Lands Cultivation)

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	4.50	4.95	7.59	7.00
	Rivne	2.06	1.94	4.23	3.30
	Lviv	50.01	49.14	78.92	115.90
	Ternopil	38.30	33.22	28.96	21.21
	Ivano-Frankivsk	1.93	2.08	2.18	2.69
	Zakarpattya	0.35	0.35	0.35	N/A
	Chernivtsi	0.60	0.85	1.34	1.45
Subtotal		97.75	92.53	123.57	151.55
Central-west	Zhytomyr	47.17	44.06	47.92	43.34
	Kyiv	37.79	30.87	48.02	31.27
	Khmelnyskyi	1.71	3.23	4.15	6.79
	Vinnitsa	1.12	2.25	2.96	3.47
	Cherkasy	35.90	26.72	24.08	25.28
	Kirovohard	0.19	0.14	0.19	0.18
Subtotal		123.88	107.27	127.32	110.33
Central-east	Chernihiv	84.69	109.72	129.96	100.30
	Sumy	5.12	5.73	6.22	10.45
	Poltava	5.02	9.53	9.91	9.09
	Dnipropetrovsk	N/A	N/A	N/A	N/A
Subtotal		94.83	124.98	146.09	119.84
East	Kharkiv	0.14	0.51	1.18	1.83
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	2.21	N/A	N/A	N/A
Subtotal		2.35	0.51	1.18	1.83
South	Odesa	0.33	1.89	2.99	3.11
	Mykolaiv	1.86	3.01	4.80	0.42
	Kherson	22.36	23.21	N/A	N/A
	Zaprizhia	0.12	0.15	N/A	N/A
Subtotal		24.67	28.26	7.79	3.53

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Trends in irrigated cultivation, which is essential for improving productivity, differ greatly by region. In Donetsk oblast in the east and Mykolaiv and Kherson oblasts in the south, which were traditionally centers of irrigated agriculture, production data has been unavailable since 2022. In contrast, irrigated production has increased in Kyiv oblast in the west-central region and in Odesa oblast in the south. This contrast is presumed to be influenced by efforts to intensify production near urban centers. The increase in Odesa, a southern region relatively less affected by the invasion, is inferred to be the result of prioritized restoration and improvement of irrigation infrastructure (as detailed in a later section). This is considered to reflect the ongoing efforts to restructure the nation's food security system.

Table 2.1.2 Trends in Regional Potato Production by Enterprises (Open-fields Cultivation)

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	N/A	N/A	N/A	N/A
	Rivne	N/A	N/A	N/A	N/A
	Lviv	N/A	N/A	N/A	N/A
	Ternopil	N/A	N/A	N/A	N/A
	Ivano-Frankivsk	N/A	N/A	N/A	N/A
	Zakarpattya	N/A	N/A	N/A	N/A
	Chernivtsi	N/A	N/A	N/A	N/A
Subtotal		N/A	N/A	N/A	N/A
Central-west	Zhytomyr	N/A	N/A	N/A	N/A
	Kyiv	13.79	10.16	28.66	14.85
	Khmelnyskyi	N/A	N/A	N/A	N/A
	Vinnitsa	N/A	N/A	N/A	N/A
	Cherkasy	N/A	N/A	N/A	N/A
	Kirovohard	N/A	N/A	N/A	N/A
Subtotal		13.79	10.16	28.66	14.85
Central-east	Chernihiv	N/A	N/A	N/A	N/A
	Sumy	N/A	N/A	N/A	N/A
	Poltava	N/A	N/A	N/A	N/A
	Dnipropetrovsk	N/A	N/A	N/A	N/A
Subtotal		N/A	N/A	N/A	N/A
East	Kharkiv	N/A	N/A	N/A	N/A
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	1.25	1.51	N/A	N/A
Subtotal		1.25	1.51	N/A	N/A
South	Odesa	0.26	1.83	2.73	2.48
	Mykolaiv	1.85	2.83	N/A	N/A
	Kherson	21.09	22.01	N/A	N/A
	Zaprizhia	N/A	N/A	N/A	N/A
Subtotal		23.20	26.67	2.73	2.48

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

3) Trends for Households

A regional analysis of potato production by households since 2021 shows that while production has significantly decreased in the heavily affected eastern and southern regions, it has generally trended upward in the relatively safer western and west-central regions. The increase is particularly notable in Lviv and Volyn oblasts in the west, and in Zhytomyr and Cherkasy oblasts in the west-central area. It is also presumed that support from the international community, such as the distribution of seed potatoes by the Food and Agriculture Organization (FAO)², may have contributed to the production recovery observed in various regions. As will be detailed in the section on donor assistance, it is hypothesized that a temporary increase in potato production was partly due to an FAO initiative in 2022, which distributed 60 kg of seed potatoes per family to a total of 17,740 households across 10 oblasts.

Table 2.1.3 Trends in Regional Potato Production by Households (Open Lands Cultivation)

Region/		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	1,169.67	1,196.57	1,201.27	1,359.02
	Rivne	1,282.64	1,284.07	1,293.43	1,311.71
	Lviv	1,522.83	1,551.99	1,602.44	1,715.05
	Ternopil	922.30	880.92	1,016.10	943.32
	Ivano-Frankivsk	1,005.89	997.16	1,021.90	1,043.54
	Zakarpattia	494.33	477.22	482.12	N/A
	Chernivtsi	578.90	596.19	635.18	624.78
Subtotal		6,976.56	6,984.12	7,252.44	6,997.42
Central-west	Zhytomyr	1,551.76	1,729.78	1,831.39	1,853.58
	Kyiv	1,468.60	1,518.46	1,470.84	1,527.16
	Khmelnytskyi	1,094.90	1,276.56	1,165.24	1,172.14
	Vinnitsa	1,825.56	1,905.51	1,592.31	1,743.76
	Cherkasy	596.16	702.46	880.44	925.81
	Kirovohrad	502.94	515.31	531.76	504.18
Subtotal		7,039.92	7,648.08	7,471.98	7,726.63
Central-east	Chernihiv	1,120.05	1,154.78	1,057.68	1,040.89
	Sumy	945.77	895.91	789.82	881.17
	Poltava	991.30	994.39	1,071.80	1,252.92
	Dnipropetrovsk	N/A	N/A	N/A	N/A
Subtotal		3,057.12	3,045.08	2,919.30	3,174.98
East	Kharkiv	842.90	712.27	661.90	336.31
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	355.82	N/A	N/A	N/A
Subtotal		1,198.72	712.27	661.90	336.31
South	Odesa	380.65	359.58	320.97	294.01
	Mykolaiv	174.92	203.95	306.48	175.76
	Kherson	236.44	256.44	N/A	N/A
	Zaporozhia	218.63	177.57	N/A	N/A
Subtotal		1,010.64	997.54	627.45	469.77

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

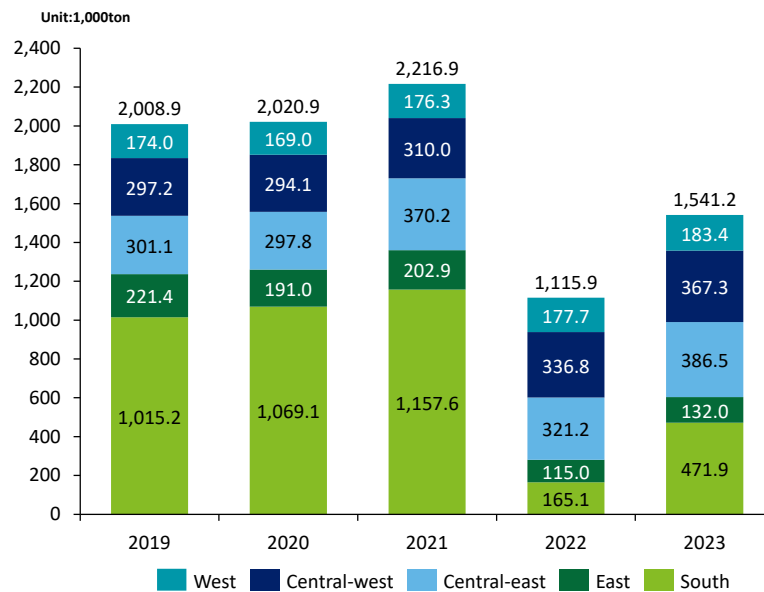
(3) Tomatoes

1) Trends in Tomato Production in Ukraine

Nationwide production of open-field tomatoes had been on an upward trend since 2019, reaching a peak of approximately 2.217 million tons in 2021. However, as a result of the invasion in 2022, production volume fell sharply to approximately 1.116 million tons (a 49.7% decrease from the previous year). By 2023, signs of recovery were observed, with production rising to approximately 1.541 million tons. In the southern regions in particular, the damage to irrigation systems caused by the collapse of the Kakhovka Dam was a primary factor in the decline of production capacity. Meanwhile, in 2023, some areas, including within these same southern regions, showed movements toward production recovery,

² Potato World Magazine. "Food security in Ukraine: FAO distributes seed potatoes to vulnerable rural families". 2022-05-27. <https://potatoworld.eu/news/fao-distributes-seed-potatoes-in-ukraine/>, (Accessed 2025-05-23).

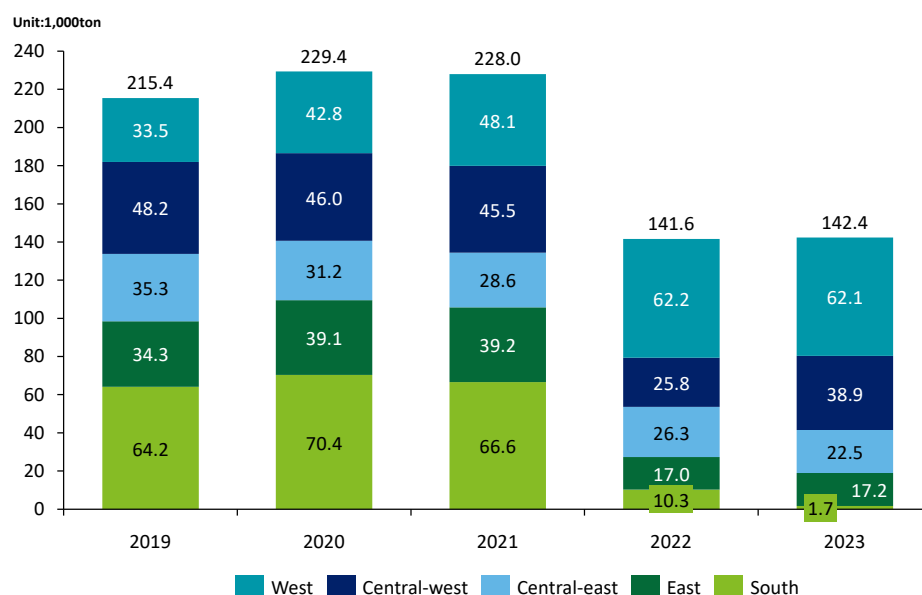
with output levels reaching approximately 40% of those seen before the invasion.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 2.1.5 Regional Trends in Production of Open-Field Tomatoes

Nationwide production of greenhouse cultivation tomatoes peaked at approximately 228,000 tons in 2020 and has since declined to approximately 142,000 tons by 2023. This trend stands in contrast to that of open-field cultivation, which is showing signs of recovery, suggesting that the greenhouse cultivation sector continues to face challenging conditions. The primary cause of this production decline is the stagnation of output in regions heavily affected by the invasion. Specifically, statistical data for the southern regions has been unavailable since 2022, while in the eastern regions, production volume has been halved, falling from approximately 39,000 tons in 2021 to approximately 17,000 tons since 2022.



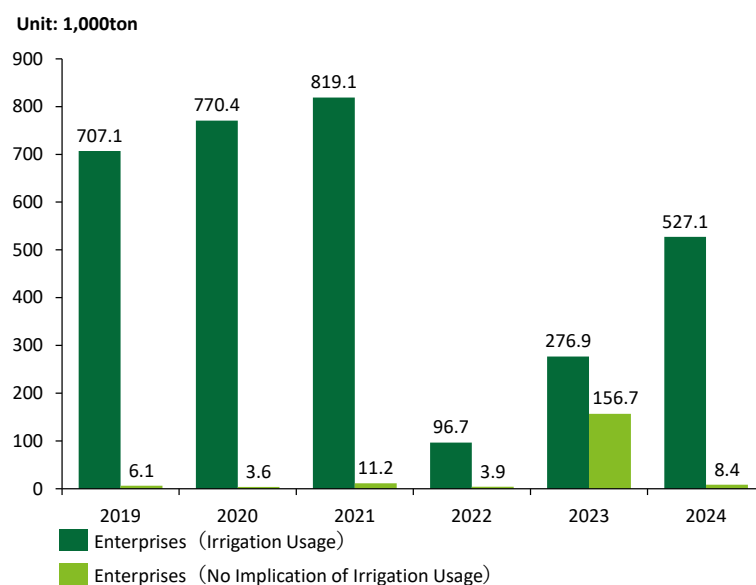
Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

[fisheries\)](#)

Figure 2.1.6 Regional Trends in Production of Greenhouse Cultivation Tomatoes

2) Production Trends in Open-Field Cultivation by Enterprises

When analyzed by producer type, open-field cultivation by enterprises, particularly in the south, had been heavily dependent on the large-scale irrigation systems sourced from the Kakhovka Dam. However, following the dam's collapse in June 2023, these irrigation facilities suffered severe damage, making irrigation impossible across extensive areas of farmland. As a result, the production volume of tomatoes using irrigation plummeted from approximately 819,000 tons in 2021 to about 96,000 tons in 2022. Although it recovered to approximately 527,000 tons in 2024, partly due to securing alternative water sources from the Danube River, the level remains below that of the pre-invasion period³.



Source: JICA survey team based on State Statistics Service of Ukraine. (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Note: The data for "Use of Irrigation Systems" was compiled from figures for Land Type: Irrigated Lands within open-field tomato production on the statistical website. The data for "No Use of Irrigation Systems" was calculated by subtracting the figure for Land Type: Irrigated Lands from that of Land Type: On All Lands.

Figure 2.1.7 Production Volume of Open-Field Tomatoes by Enterprises (Comparison with and without Irrigation Systems)

Observing the regional production structure, open-field cultivation by enterprises using irrigation was concentrated in the three southern oblasts: Kherson, Mykolaiv, and Odesa. However, since 2023, data for Kherson oblast has been missing, and a significant decrease has been observed in Mykolaiv oblast.

³ Water International. "Prospects for restoration of Ukraine's irrigation system". 2025-03-13. <https://www.tandfonline.com/doi/full/10.1080/02508060.2025.2472718#d1e752>, (Accessed 2025-07-01).

Table 2.1.4 Trends in Regional Tomato Production by Enterprises (Open-Field, Utilizing Irrigation Systems)

Region		Production Volume (1,000 tons)				
		2020	2021	2022	2023	2024
West	Volyn	N/A	N/A	N/A	N/A	N/A
	Rivne	N/A	N/A	N/A	N/A	N/A
	Lviv	N/A	N/A	N/A	N/A	N/A
	Ternopil	N/A	N/A	N/A	N/A	N/A
	Ivano-Frankivsk	N/A	N/A	N/A	N/A	N/A
	Zakarpattia	N/A	N/A	N/A	N/A	N/A
Central-west	Chernivtsi	N/A	N/A	N/A	N/A	N/A
	Subtotal	N/A	N/A	N/A	N/A	N/A
	Zhytomyr	N/A	N/A	N/A	N/A	N/A
	Kyiv	N/A	0.07	N/A	N/A	0.34
	Khmelnitskyi	N/A	N/A	N/A	N/A	N/A
	Vinnitsa	N/A	N/A	N/A	N/A	N/A
Central-east	Cherkasy	N/A	0.05	N/A	N/A	0.38
	Kirovohard	0.05	N/A	N/A	N/A	N/A
	Subtotal	0.05	0.12	N/A	N/A	0.72
	Chernihiv	N/A	N/A	N/A	N/A	N/A
	Sumy	N/A	N/A	N/A	N/A	N/A
	Poltava	N/A	N/A	N/A	N/A	N/A
East	Dnipropetrovsk	0.49	0.71	0.19	0.35	1.61
	Subtotal	0.49	0.71	0.19	0.35	1.61
	Kharkiv	0.11	0.14	0.13	N/A	N/A
	Luhansk	N/A	N/A	N/A	N/A	N/A
	Donetsk	N/A	N/A	N/A	N/A	N/A
	Subtotal	0.11	0.14	0.13	N/A	N/A
South	Odesa	16.96	15.85	18.58	83.60	64.81
	Mykolaiv	244.63	348.54	393.38	12.18	206.36
	Kherson	443.98	403.95	406.49	N/A	N/A
	Zaprizhia	0.04	0.40	0.13	N/A	N/A
	Subtotal	705.61	768.74	818.58	95.78	271.17

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

3) Production Trends in Greenhouse Cultivation by Enterprises

For greenhouse tomato cultivation by enterprises, the main production areas are Kharkiv oblast (East), Cherkasy oblast (West-Central), and Sumy and Dnipropetrovsk oblasts (East-Central), which serve as the hubs for this type of cultivation. Small-scale production continues in some other western and southern oblasts.

Table 2.1.5 Trends in Regional Tomato Production by Enterprises (Greenhouse Cultivation)

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	N/A	N/A	N/A	N/A
	Rivne	N/A	N/A	N/A	N/A
	Lviv	N/A	N/A	N/A	N/A
	Ternopil	N/A	N/A	N/A	N/A
	Ivano-Frankivsk	N/A	N/A	N/A	N/A
	Zakarpattia	15.55	19.87	N/A	21.82
Central-west	Chernivtsi	19.73	16.62	N/A	17.40
	Subtotal	35.28	36.49	N/A	39.22
	Zhytomyr	N/A	N/A	N/A	N/A
	Kyiv	N/A	N/A	N/A	N/A
	Khmelnitskyi	N/A	N/A	N/A	N/A
	Vinnitsa	N/A	N/A	N/A	N/A
Central-east	Cherkasy	66.58	72.89	81.80	79.97
	Kirovohard	19.76	N/A	N/A	18.89
	Subtotal	86.34	72.89	81.80	98.86
	Chernihiv	N/A	N/A	N/A	N/A
	Sumy	48.95	49.14	46.82	45.60
	Poltava	N/A	N/A	N/A	N/A
East	Dnipropetrovsk	39.05	40.48	37.25	35.86
	Subtotal	88.00	89.62	84.07	81.46
	Kharkiv	121.81	125.18	126.55	124.53
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	N/A	N/A	N/A	N/A
	Subtotal	121.81	125.18	126.55	124.53
South	Odesa	N/A	N/A	N/A	N/A
	Mykolaiv	47.77	N/A	N/A	20.87
	Kherson	N/A	N/A	N/A	N/A
	Zaprizhia	N/A	N/A	N/A	N/A
Subtotal	Subtotal	47.77	N/A	N/A	20.87

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

4) Production Trends in Open-Field Cultivation by Households

For production by households, both open-field and greenhouse cultivation were previously centered in Kherson oblast before the invasion. However, since 2022, it is confirmed that data for this oblast has been missing, and production has stagnated.

Table 2.1.6 Trends in Regional Tomato Production by Households (Open-field Cultivation)

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	N/A	N/A	N/A	N/A
	Rivne	N/A	N/A	N/A	N/A
	Lviv	15.55	19.87	N/A	21.82
	Ternopil	19.73	16.62	N/A	17.40
	Ivano-Frankivsk	N/A	N/A	N/A	N/A
	Zakarpattia	N/A	N/A	N/A	N/A
	Chernivtsi	N/A	N/A	N/A	N/A
Subtotal		35.28	36.49	N/A	39.22
Central-west	Zhytomyr	N/A	N/A	N/A	N/A
	Kyiv	66.58	72.89	81.80	79.97
	Khmelnytskyi	19.76	N/A	N/A	18.89
	Vinnitsa	N/A	N/A	N/A	N/A
	Cherkasy	N/A	N/A	N/A	N/A
	Kirovohrad	48.95	49.14	46.82	45.60
Subtotal		135.29	122.03	128.62	144.46
Central-east	Chernihiv	39.05	40.48	37.25	35.86
	Sumy	N/A	N/A	N/A	N/A
	Poltava	121.81	125.18	126.55	124.53
	Dnipropetrovsk	N/A	N/A	N/A	N/A
	Subtotal	160.86	165.66	163.80	160.39
East	Kharkiv	N/A	N/A	N/A	N/A
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	47.77	N/A	N/A	20.87
Subtotal		47.77	N/A	N/A	20.87
South	Odesa	N/A	N/A	N/A	N/A
	Mykolaiv	N/A	N/A	N/A	N/A
	Kherson	196.13	205.88	N/A	N/A
	Zaprizhia	N/A	N/A	N/A	N/A
Subtotal		196.13	205.88	N/A	N/A

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

5) Production Trends in Greenhouse Cultivation by Households

In the data for greenhouse cultivation by households, gaps and missing entries are frequently observed. Furthermore, for the regions where 2023 data was available (Chernivtsi oblast in the west; Chernihiv and Poltava oblasts in the east-central region; and Donetsk oblast in the east), a decrease in production volume was noted compared to 2021. Nevertheless, signs of new production activities are also emerging. For example, in Ternopil oblast in the west, the production volume from greenhouse cultivation by households increased to approximately 23,000 tons in 2023, up from about 12,000 tons in 2021.

Table 2.1.7 Trends in Regional Tomato Production by Households (Greenhouse Cultivation)

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	N/A	N/A	N/A	N/A
	Rivne	N/A	N/A	N/A	N/A
	Lviv	1.27	1.26	N/A	N/A
	Terнопil	12.91	12.19	N/A	22.73
	Ivano-Frankivsk	N/A	N/A	N/A	N/A
	Zakarpattya	N/A	N/A	N/A	N/A
	Chernivtsi	2.57	2.11	2.01	1.97
Subtotal		16.75	15.56	2.01	24.70
Central-west	Zhytomyr	N/A	N/A	N/A	N/A
	Kyiv	4.07	4.11	4.14	N/A
	Khmelnyskyi	1.85	N/A	N/A	N/A
	Vinnitsa	N/A	N/A	N/A	N/A
	Cherkasy	N/A	N/A	N/A	N/A
	Kirovohard	1.10	1.10	1.15	N/A
	Subtotal	7.02	5.21	5.29	N/A
Central-east	Chernihiv	0.60	0.60	0.56	0.55
	Sumy	N/A	N/A	N/A	N/A
	Poltava	2.49	2.55	2.52	2.52
	Dnipropetrovsk	N/A	N/A	N/A	N/A
Subtotal		3.09	3.15	3.08	3.07
East	Kharkiv	N/A	N/A	N/A	N/A
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	1.83	1.81	1.82	0.62
Subtotal		1.83	1.81	1.82	0.62
South	Odesa	N/A	N/A	N/A	N/A
	Mykolaiv	N/A	N/A	N/A	N/A
	Kherson	35.05	40.77	N/A	N/A
	Zapozhzhia	N/A	N/A	N/A	N/A
Subtotal		35.05	40.77	N/A	N/A

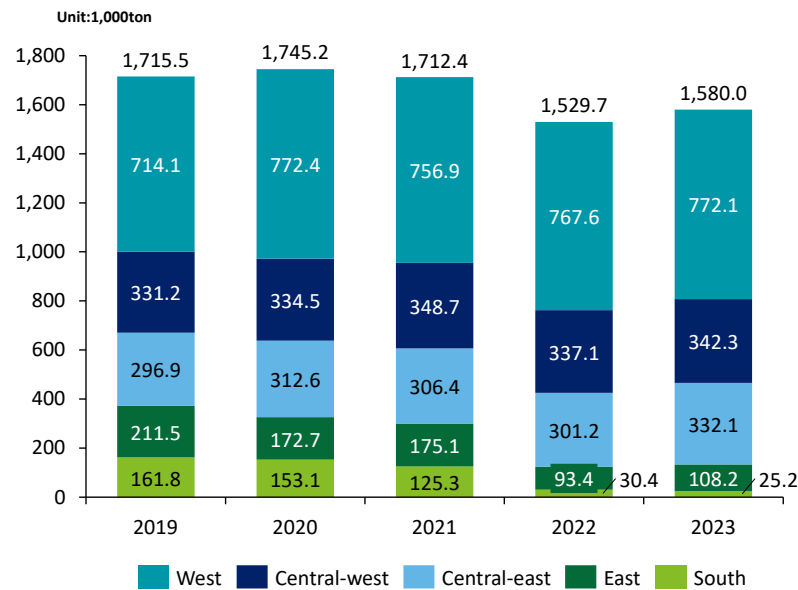
Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

(4) Cabbage

1) Trends in Cabbage Production in Ukraine

The total production volume of cabbage in Ukraine (including both open-field and greenhouse cultivation) remained within the range of 1.71 to 1.74 million tons from 2019 to 2021. However, it shows a downward trend thereafter, decreasing to approximately 1.53 million tons in 2022 and approximately 1.58 million tons in 2023. This decrease is primarily attributed to a slump in production, particularly in the southern regions.

An overview of the regional production structure reveals that the western region maintains its status as the country's largest production area, with its output in 2023 reaching approximately 770,000 tons, accounting for roughly half of the total national production. The west-central and east-central regions also possess relatively stable production bases, with outputs of approximately 340,000 tons and 330,000 tons, respectively. In contrast, the decline in production in recent years has been particularly pronounced in the eastern and southern regions. Notably, the production volume in the southern region for 2023 stood at approximately 20,000 tons, marking the lowest level in the country. Regarding production methods, greenhouse cultivation accounted for only about 0.1% (approximately 1,900 tons) of the total volume as of 2023, indicating that the country's cabbage production structure remains heavily dependent on open-field cultivation.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 2.1.8 Regional Trends in Production of Cabbage

2) Trends for Enterprises

A detailed examination of production trends by oblast reveals that Dnipropetrovsk oblast in the east-central region is the country's largest producer, with a production volume of approximately 41,000 tons, accounting for roughly 49% of the total national production by enterprises. This is followed by Kyiv oblast in the west-central region with approximately 8,000 tons (about 10%). The structure is such that these two oblasts together account for approximately 60% of the domestic production.

As a notable trend since 2022, production volume has sharply decreased in the southern and eastern regions. On the other hand, production levels in the west-central and western regions have remained stable or slightly increased, confirming that a significant shift in the country's production map has occurred.

Table 2.1.8 Trends in Regional Cabbage Production by Enterprises

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	1.11	0.93	1.22	0.91
	Rivne	2.43	1.70	2.69	1.02
	Lviv	3.76	3.76	6.19	5.91
	Terнопil	3.53	2.95	3.68	3.37
	Ivano-Frankivsk	1.21	0.69	1.08	1.32
	Zakarpattya	N/A	0.44	N/A	N/A
	Chernivtsi	0.57	0.43	0.43	0.99
Subtotal		12.61	10.90	15.29	13.52
Central-west	Zhytomyr	1.00	0.55	0.26	0.58
	Kyiv	10.10	10.33	8.36	8.42
	Khmelnyskyi	4.30	4.21	5.27	4.76
	Vinnysa	0.95	0.89	1.00	1.98
	Cherkasy	4.90	3.79	6.36	1.28
	Kirovohard	0.61	0.30	0.26	0.25
	Subtotal	21.86	20.07	21.51	17.27
Central-east	Chernihiv	1.19	0.72	1.40	1.16
	Sumy	0.18	0.09	0.82	1.77
	Poltava	0.60	0.46	0.56	0.64
	Dnipropetrovsk	41.65	42.98	25.71	40.83
	Subtotal	43.62	44.25	28.49	44.40
East	Kharkiv	8.63	6.14	0.70	1.63
	Luhansk	N/A	N/A	N/A	N/A
	Donetsk	2.61	2.50	N/A	N/A
Subtotal		11.24	8.64	0.70	1.63
South	Odesa	4.17	1.67	2.97	5.14
	Mykolaiv	5.14	3.28	0.77	1.04
	Kherson	12.78	7.87	N/A	N/A
	Zaproyzhia	7.71	7.36	N/A	N/A
Subtotal		29.80	20.18	3.74	6.18

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

3) Trends for Households

In an analysis of production trends by producer type, the western region plays a central role in cabbage production by households. Lviv oblast (West), in particular, is the largest production area in the country, accounting for approximately 370,000 tons in 2023, which represents about 27% of the total national production by households. A key characteristic is that high production levels are maintained throughout the entire western region, including this oblast.

In contrast, in the eastern and southern regions, the number of oblasts for which statistical data has become unavailable has increased since 2022. This strongly suggests that production activities in these regions have significantly stagnated, and it is considered that production volume has also decreased substantially. Meanwhile, production by households in the west-central and east-central regions has remained relatively stable.

Table 2.1.9 Trends in Regional Cabbage Production by Households

Region		Production Volume (1,000 tons)			
		2020	2021	2022	2023
West	Volyn	54.72	51.41	52.51	52.11
	Rivne	80.65	76.12	77.37	84.15
	Lviv	368.68	375.44	375.79	372.94
	Terнопil	58.28	60.31	60.83	63.02
	Ivano-Frankivsk	58.30	59.39	61.20	62.90
	Zakarpattia	N/A	89.57	N/A	N/A
	Chernivtsi	34.46	33.78	32.41	33.92
Subtotal		655.09	746.02	660.11	669.04
Central-west	Zhytomyr	91.30	81.00	71.63	78.60
	Kyiv	67.31	86.79	80.27	91.28
	Khmelnitskyi	33.95	34.35	34.39	34.60
	Vinnitsa	57.11	63.64	64.98	64.90
	Cherkasy	45.64	45.37	47.90	38.65
	Kirovohrad	17.29	17.49	16.46	17.00
	Subtotal	312.60	328.64	315.63	325.03
Central-east	Chernihiv	45.79	34.25	36.74	36.09
	Sumy	31.39	26.82	36.31	33.07
	Poltava	75.41	71.39	75.26	73.99
	Dnipropetrovsk	116.36	129.73	124.37	144.59
	Subtotal	268.95	262.19	272.68	287.74
East	Kharkiv	97.23	96.67	49.33	69.90
	Luhansk	N/A	23.52	23.40	N/A
	Donetsk	39.50	46.22	N/A	N/A
	Subtotal	136.73	166.41	72.73	69.90
South	Odesa	17.68	12.53	14.90	13.87
	Mykolaiv	10.15	11.45	6.95	4.40
	Kherson	83.04	70.78	N/A	N/A
	Zapozhzhia	12.42	10.36	N/A	0.71
	Subtotal	123.29	105.12	21.85	18.98

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

2.1.2 Considerations Regarding Production Volume (Based on Insights from an Interview with a Potato Production Expert)

(1) Background and Process of the Decline in Household Production

The analysis in this section is based on the interview with a local expert specializing in potato production, who also serves as a consultant for the World Bank. According to the expert, the structure of household production for major vegetables in Ukraine, including potatoes, cabbage, and tomatoes, has undergone two significant turning points in recent years.

The first turning point was triggered by the spread of the COVID-19 pandemic from 2019. During this period, production by households started to decline. A shift toward berry cultivation and a general reduction in agricultural output began to take place, particularly in suburban areas.

The second turning point stemmed from the impact of the full-scale Russian invasion beginning in 2022. Since that year, potato production by households has plummeted. According to the expert, there was a substantial decrease of approximately 60% year-on-year. This decline in production has been especially pronounced in the southern regions, such as Kherson and Mykolaiv Oblasts, with similar trends observed for other vegetables like cabbage and tomatoes.

These changes in the production structure are attributed to a complex interplay of numerous factors. In addition to the socio-economic impacts of the COVID-19 pandemic, these factors include population outflow and the military mobilization of men caused by the invasion; a shift to berry cultivation driven by its higher profitability, earlier market entry, and reduced labor burden; infrastructure damage; shortages of agricultural inputs; the aging of rural populations; and shifts in production areas due to climate change.

The data collection methods employed by the State Statistics Service of Ukraine differ for the enterprise and household sectors. For the enterprise sector, agricultural corporations and individual entrepreneurs are legally required to submit annual reports, which consist of various statistical forms, via online systems. The State Statistics Service of Ukraine then aggregates this data, covering aspects such as cultivation area, harvest volume, and sales, based on official accounting records.

In contrast, for the household sector, production data is mainly gathered indirectly from sources such as residential surveys by local authorities, sample surveys, and subsidy application records. However, a large share of household produce is for self-consumption or sold through informal channels like local bazaars, which makes the collection of precise data challenging. Consequently, the actual scale of production activities is often not fully captured in official statistics. This means that production and distribution volumes attributed to the household sector tend to be estimates, which are susceptible to data gaps and underreporting in certain regions or years⁴. As a result, it should be noted that the household production figures compiled by the State Statistics Service of Ukraine do not necessarily provide an accurate reflection of the current situation.

2.1.3 Storage

(1) Overview of Domestic Vegetable Storage Facilities

Ukraine's agricultural sector faces a chronic shortage of vegetable storage facilities, which is a contributing factor to serious post-harvest losses. Approximately 35% of harvested vegetables, equivalent to over 1.0 million tons annually, are discarded before reaching consumers. This situation has been further exacerbated by the impact of the Russian invasion. Currently, the shortage of storage facilities exceeds 1.1 million tons, while the total domestic storage capacity is only about 300,000 tons⁵.

By item, this facility shortage is estimated to be approximately 110,000 tons⁶ for potatoes and about 60,000 tons for cabbage. In the cabbage market in particular, the lack of storage capacity leads to quality degradation, which in turn has become a factor squeezing producer profits, as evidenced by an 18% year-on-year drop in market prices⁷.

To address these challenges, the Government of Ukraine has formulated a storage infrastructure development plan for 2026–2028. The plan targets enterprises and promotes the construction of new

⁴ KSE. “Agricultural statistics in Ukraine: current state and proposal for improvement” . 2024-02. https://kse.ua/wp-content/uploads/2024/03/Report_Statistics.pdf, (Accessed 2025-12-10).

⁵ LIGA.net. “Ukraine loses more than a third of its harvest due to lack of vegetable storage facilities – Koval”. 2024-07-14. <https://biz.liga.net/en/all/prodovolstvie/novosti/ukraine-loses-more-than-a-third-of-its-harvest-due-to-lack-of-vegetable-storage-facilities-koval>, (Accessed 2025-07-01).

⁶ Ukrinform. “Україна потребує додаткових овочесховищ на 340 тисяч тонн - Мінагрополітики”. 2025-03-12. <https://www.ukrinform.ua/rubric-economy/3969886-ukraina-potrebuie-dodatkovih-ovoceshovis-na-340-tisac-tonn-minagropolitiki.html>, (Accessed 2025-07-01).

⁷ Fresh Plaza. “Storage shortage and rising costs: Ukrainian vegetable prices under pressure”. 2025-03-10. <https://www.freshplaza.com/europe/article/9712300/storage-shortage-and-rising-costs-ukrainian-vegetable-prices-under-pressure/>, (Accessed 2025-07-01).

vegetable and fruit storage facilities with capacities of 3,000 tons or more⁸.

2.1.4 Processing

In Ukraine, the processing of major vegetables such as potatoes, tomatoes, and cabbage is primarily handled by large-scale Enterprises, with limited instances of smaller-scale farmers, including small Enterprises and Households, entering the processing sector. As a result, the dominant practice for small-scale farmers is to sell their harvest as fresh produce with low added value, and collaboration with the processing industry has not progressed.

1) Potatoes

Potatoes, which have the highest production volume in the country, are primarily consumed fresh or refrigerated. Processed products include frozen potatoes, canned goods, potato flakes, and starch. These products, which have a long shelf life, are shipped not only to the domestic market but also for export. In particular, processing into products with long-term storage potential, such as potato flakes and starch, contributes to reducing post-harvest losses and increasing the added value of agricultural products.

2) Tomatoes

Compared to other items, the processing industry for tomatoes is more developed. Products are manufactured to meet diverse market demands and consumer convenience, such as canned goods, purées, ketchup, and juices. This processing reduces post-harvest losses for tomatoes, which have a short shelf life, and simultaneously plays a significant role in both domestic and international markets.

3) Cabbage

On the other hand, the processing of cabbage is limited, with consumption as a fresh product being central. A representative processed product is sauerkraut, a traditional fermented food. However, its production is mainly based on traditional household methods, and commercial production and sales are limited to certain segments of the urban market. The underlying factors for this are thought to include the fact that cabbage itself can be stored for a relatively long period, is easy to cook, and is deeply rooted in traditional food culture.

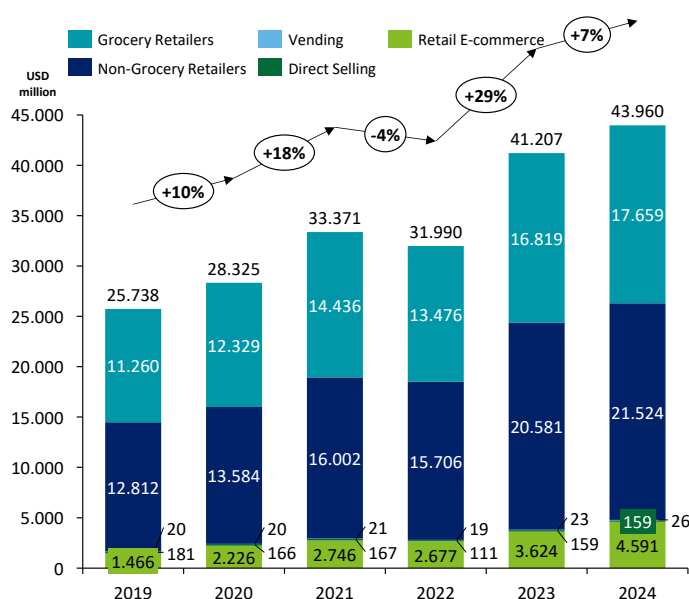
⁸ РАДА Верховна Рада України. “П р о внесення змін до постанов Кабінету Міністрів України від 21 червня 2022 р. № 738 і від 4 лютого 2023 р. № 98”. 2026-01-21. <https://zakon.rada.gov.ua/laws/show/62-2026-%D0%BF#Text>, (Accessed 2026-02-05).

2.2 Consumption: Domestic and International Trends and Future Projections

2.2.1 Domestic Distribution and Sales

Distribution and sales channels for goods in Ukraine are diversified, consisting of various coexisting forms including Grocery Retailers, Non-Grocery Retailers, Vending, Direct Selling, and Retail E-commerce⁹.

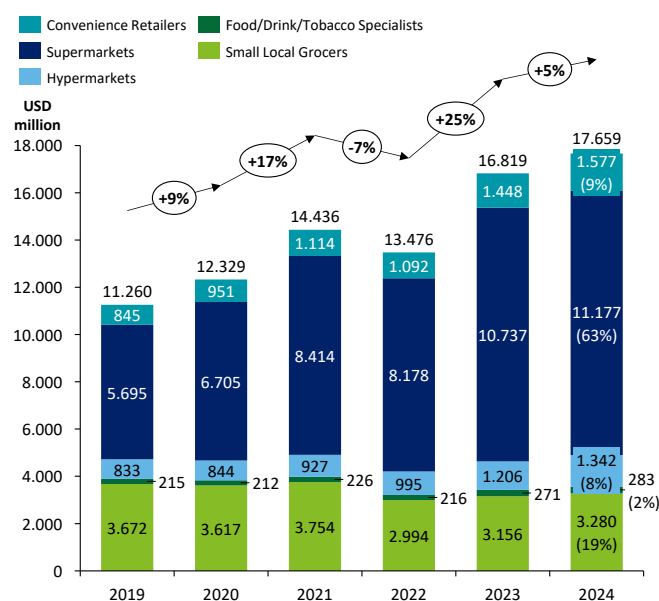
Focusing on food sales, the primary channels are diverse, ranging from modern retail formats like convenience stores, supermarkets, and hypermarkets to local small-scale grocery stores and Retail E-commerce. Among these varied channels, supermarkets currently hold the most dominant position in food sales.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine." (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.2.1 Trends in Sales Channels in Ukraine (All Goods)

⁹ Euromonitor. "Retail in Ukraine April 2025". 2025-04. <https://www.euromonitor.com/retail-in-ukraine/report>, (Accessed 2025-07-25).

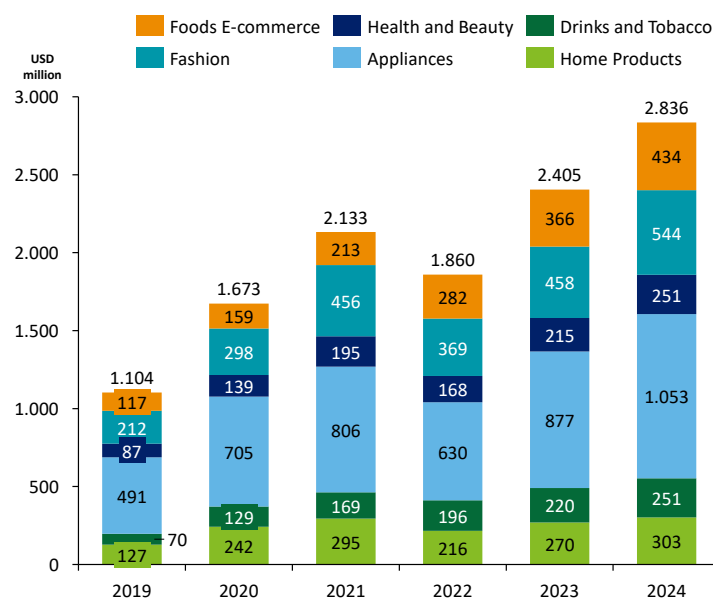


Source: JICA survey team based on Euromonitor International, "Retail in Ukraine." (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.2.2 Trends in Sales Channels in Ukraine (Food)

Furthermore, a notable recent trend is the expansion of Retail E-commerce usage. In the food sector, in particular, sales volume has increased by approximately 2.7 times over the last five years, showing remarkable growth.

These trends suggest that the main axis of consumer purchasing behavior is shifting from traditional, community-based small grocery stores to modern sales channels such as supermarkets and Retail E-commerce, which offer superior product selection and convenience.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine." (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.2.3 Trends in Sales Channels in Ukraine (by Retail E-commerce Category)

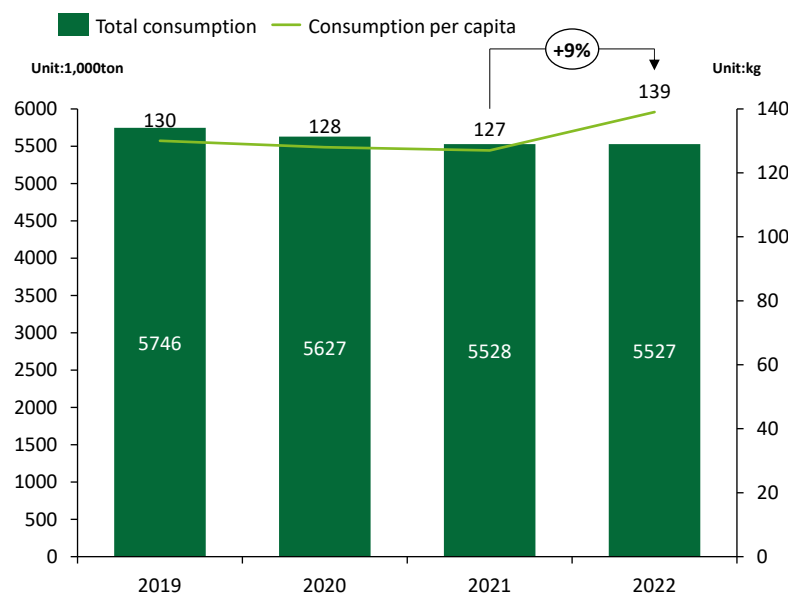
2.2.2 Domestic Consumption

This chapter organizes the results obtained from the study on the consumption trends of potatoes, tomatoes, and cabbage—major vegetable items in Ukraine—and analyzes their characteristics.

(1) Potatoes

The total domestic consumption of potatoes is on a downward trend, decreasing by approximately 220,000 tons over four years, from about 5.75 million tons in 2019 to about 5.53 million tons in 2022. On the other hand, the annual per capita consumption during the same period increased from 130 kg to 139 kg, recording a particularly remarkable increase of about 9% between 2021 and 2022¹⁰.

This contradictory trend, where total consumption is decreasing while per capita consumption is increasing, first strongly suggests that the decrease in the total population due to displacement abroad and internal migration caused by the Russian invasion is affecting the denominator in the statistics. Additionally, this increase in per capita consumption could also be attributed to a combination of factors, including changes in individual consumption behavior and dietary habits, such as a heightened demand for potatoes as a basic and relatively inexpensive food item amidst economic and social instability.



Source: JICA survey team based on World Population Review, "Potato Consumption by Country 2025". (<https://worldpopulationreview.com/country-rankings/potato-consumption-by-country>)

Figure 2.2.4 Trends in Potato Consumption

(2) Tomatoes and Cabbage

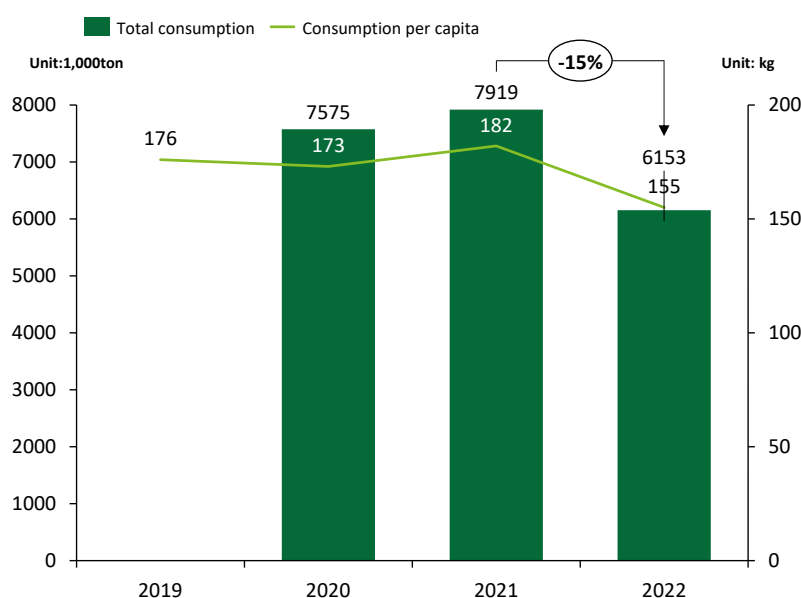
Next, looking at the overall consumption trends for vegetables, including tomatoes and cabbage, the total consumption volume was stable at approximately 7.575 million tons in 2020, before temporarily increasing to about 7.919 million tons in 2021 (no data for 2019). However, it fell sharply to about 6.153

¹⁰ World Population Review. "Potato Consumption by Country 2025". <https://worldpopulationreview.com/country-rankings/potato-consumption-by-country>, (Accessed 2025-07-28).

million tons in 2022, which is a significant decrease of approximately 23% from the previous year.

In line with this fluctuation in total consumption, the annual per capita vegetable consumption has also dropped significantly, from levels of 176 kg in 2019 and 182 kg in 2021 to 155 kg in 2022. This trend, where both total and per capita consumption are decreasing, shows a different pattern from that of potatoes, for which per capita consumption as a staple food increased¹¹.

The sharp decline in vegetable consumption in 2022 is a result of the impact of the Russian invasion. Specifically, this can be attributed to the fact that major production areas within the country were damaged by the invasion, leading to a substantial decrease in production volume, and that the disruption of logistics networks made it difficult to transport vegetables to various regions. As a consequence, the volume of vegetables supplied to markets and retail stores was significantly reduced, severely restricting the opportunities for individuals to obtain vegetables. This resulted in a substantial drop in both total and per capita consumption.



Source: JICA survey team based on World Population Review, "Vegetable Consumption by Country 2025." (<https://worldpopulationreview.com/country-rankings/vegetable-consumption-by-country>)

Figure 2.2.5 Trends in Vegetable Consumption

2.2.3 Overview of Exports and Imports

This section organizes and analyzes the export and import trends for potatoes, tomatoes, and cabbage in Ukraine, based on data from the World Integrated Trade Solution (WITS).

(1) Potatoes

Looking at the import trends for potatoes in 2024 by item, a wide variety of products are imported. The largest volume is accounted for by "Other potatoes, fresh or chilled," with an import volume of

¹¹ World Population Review. "Vegetable Consumption by Country 2025". <https://worldpopulationreview.com/country-rankings/vegetable-consumption-by-country>, (Accessed 2025-07-28).

75,622 tons and an import value of approximately 37 million USD. The main supplying countries are Poland and the Netherlands. Additionally, 1,956 tons of "Seed potatoes" were imported (approximately 2.08 million USD), with Germany, the Netherlands, and Poland being the primary sources.

The import of processed goods is also active. In particular, the scale of imports for "Potatoes, preserved other than by vinegar" is large. Their import volume reaches 36,251 tons, and the value amounts to approximately 52.02 million USD, a scale that exceeds the import value of fresh products. The main supplying countries are Poland, Belgium, and the Netherlands. Other processed goods include 408 tons of "Potato flakes, granules and pellets" (approximately 754,000 USD) and 663 tons of "Potato starch" (approximately 910,000 USD), with EU countries, primarily Poland, holding the position of major suppliers for these items as well.

Overall, Ukraine's potato imports show a structure that is heavily dependent on EU countries, including neighboring Poland. Furthermore, an analysis of the import composition reveals that while fresh products are central in terms of volume, high-value-added processed goods, such as "Potatoes, preserved other than by vinegar," (referred as canned products) are the largest in terms of value, indicating diverse demands in the domestic market. In addition, due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. This has cut off the supply of fresh/refrigerated potatoes and starch that were traditionally imported from Belarus, resulting in Ukraine's further increased dependence on imports from EU countries.

Table 2.2.1 Import Volume, Value, and Key Supplying Countries for Potatoes by Item (2024)

Item	Import Volume	Import Amount	Major Import countries (Share)
Seed potatoes	1,956ton	\$2,076,000	- Germany(53%) - Netherlands (32%) - Poland (10%)
Other potatoes, fresh or chilled	75,622ton	\$36,950,000	- Poland (44%) - Netherlands (4%) *Belarus (2020: 172,194 tons, 58%, 2021: 20,379 tons, 11%)
Potatoes, frozen	N/A	N/A	N/A
Potato flakes, granules and pellets	408ton	\$754,000	- Poland(87%) - France(8%) - Belgium(5%)
Potato starch	663ton	\$914,000	- Austria (51%) - Denmark(23%) - Poland(8%) *Belarus (2020: 1,188 tons, 53%, 2021: 225 tons, 7%)
Preserved potatoes other than by vinegar	36,251ton	\$52,017,000	- Poland (57%) - Belgium (20%) - Netherlands(13%)

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>). Note: Due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. However, as it was a major trading partner before the invasion, it is listed for reference to past trends.

On the other hand, the potato export trend shows a contrasting structure to imports. The most notable export is "Potato starch," with an export volume of 6,094 tons and an export value reaching approximately 5.89 million USD. This accounts for most of the total export value, indicating that processed goods made from potatoes, especially starch, are major export products for Ukraine. The main export destinations are diverse, centering on EU countries such as Bulgaria, Romania, and Poland.

In contrast, the export of "Other potatoes, fresh or chilled" is extremely limited compared to the import

volume, at 2,022 tons (approximately 446,000 USD). The main export destination is Moldova, but until 2022, Belarus was also a major destination. Exports to Belarus fluctuated significantly from 2020 to 2022, accounting for about 60% of the total in 2020 and about 80% in 2021, but both the proportion and volume decreased sharply in 2022. Due to the suspension of trade with Belarus since 2022 following the Russian invasion, data has been unavailable since 2023. Therefore, the decrease in exports to Belarus has significantly affected the total export volume of fresh and refrigerated potatoes.

Table 2.2.2 Export Volume, Value, and Key Supplying Countries for Potatoes by Item (2024)

Item	Export Volume	Export amount	Major Export countries (Share)
Seed potatoes	665ton	\$114,000	• Azerbaijan (100%)
Other potatoes, fresh or chilled	2,022ton	\$446,000	• Moldova (98%) *Belarus (2020: 1,658 tons, 60%, 2021: 14,313 tons, 79%, 2022: 5,156 tons, 18%)
Potatoes, frozen	0.5ton	\$1,100	• Marshall Islands(80%) *Poland (20.4 tons, 96% in 2022) *Hungary (3.6 tons, 74% in 2023)
Potato flakes, granules and pellets	9.1ton	\$26,300	• France(100%) *Belgium (21.6 tons, 94% in 2019) *Belarus (2020: 0.1 ton, 100%, 2021: 0.7 tons, 100%)
Potato starch	6,094ton	\$5,892,000	• Bulgaria (32%) • Romania (11%) • Poland(11%) • Lithuania (11%) • Algeria(9%)
Preserved potatoes other than by vinegar	4.3ton	\$12,700	• Poland(12%) *Moldova (2021: 44.6 tons, 71%, 2022: 10.7 tons, 17%) *Senegal (2022: 32.4 tons, 51%)

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>). Note: Due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. However, as it was a major trading partner before the invasion, it is listed for reference to past trends.

(2) Tomatoes

In 2024, both fresh and processed tomatoes were imported on a large scale, highlighting the reality that diverse domestic market demands are met by foreign supply. The import is led by "Tomatoes, fresh or chilled," with an import value of approximately 130.55 million USD (import volume: approx. 102,000 tons), which is exceptionally large among all items. The main supplying countries are Turkey, a major tomato-producing nation, and the EU countries of the Netherlands and Poland. On the other hand, the item with the largest volume is "Tomatoes, preserved otherwise than by vinegar" (often as purée), used as a processing ingredient, with an import volume of about 120,000 tons (import value: approx. 21.44 million USD), sourced mainly from global supply hubs like China, Italy, and Spain.

Other processed goods include "Tomatoes, whole or in pieces, preserved" (approx. 2,300 tons, 3.78 million USD) and "Tomato ketchup and other tomato sauces" (approx. 2,900 tons, 6.93 million USD), mainly from Italy and Poland, and "Tomato juice" (approx. 1,430 tons, 1.24 million USD), mainly from Poland and Moldova.

Table 2.2.3 Import Volume, Value, and Key Supplying Countries for Tomatoes by Item (2024)

Item	Import Volume	Import Amount	Major Import countries (Share)
Tomatoes, fresh or chilled	102,311ton	\$130,548,000	- Turkey(80%) - Poland(8%) - Netherlands (3%)
Tomatoes, whole or in pieces, preserved	2,250ton	\$3,778,000	- Italy(90%) - Poland (5%)
Tomatoes, preserved otherwise than by vinegar	11,993ton	\$21,437,000	- China (28%) - Spain(28%) - Italy (25%)
Tomato ketchup and other tomato sauce	2,923ton	\$6,930,000	- Poland (42%) - Italy(26%) - Netherlands (4%)
Tomato juice, unfermented, not containing added	1,427ton	\$1,240,000	- Poland (67%) - Moldova (16%) *Belarus (2020: 149 tons, 19%, 2021: 270 tons, 32%, 2022: 28 tons, 1%)

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>). Note: Due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. However, as it was a major trading partner before the invasion, it is listed for reference to past trends.

In contrast, tomato exports show a structure significantly different from imports, with processed goods at its center. The primary export item is "Tomatoes, preserved otherwise than by vinegar" (often as purée), with an export volume of 20,817 tons and an export value of approximately 35.09 million USD. This indicates the existence of a tomato processing industry in Ukraine large enough to supply products to foreign markets. The main export destinations are EU countries such as Poland, the Czech Republic, and Germany. In stark contrast, the export of "Tomatoes, fresh or chilled" is a mere 265 tons (approx. 310,000 USD), reinforcing the fact that the fresh market is heavily reliant on imports. The main export destinations are neighboring Poland and Moldova.

Other processed goods exported include "Tomato ketchup and other tomato sauces" at 6,860 tons (approx. 920,000 USD) and "Tomato juice" at 1,633 tons (approx. 1.04 million USD). Ketchup is supplied to neighboring countries like Moldova and Georgia, while juice is supplied to destinations such as Moldova, Israel, and the United States.

Table 2.2.4 Export Volume, Value, and Key Supplying Countries for Tomatoes by Item (2024)

Item	Export Volume	Export amount	Major Export countries (Share)
Tomatoes, fresh or chilled	265ton	\$306,000	Moldova(91%) *Belarus (2020: 1,479 tons, 14%, 2021: 2,262 tons, 34%)
Tomatoes, whole or in pieces, preserved	1,634ton	\$1,800,000	- Germany (61%) - United States(12%) - Lithuania (9%) - Canada (8%)
Tomatoes, preserved otherwise than by vinegar	20,817ton	\$35,089,000	- Poland (47%) - Germany (14%) - Czech Republic (5%)
Tomato ketchup and other tomato sauce	6,860ton	\$9,180,000	- Moldova (39%) - Georgia (24%) - Lithuania (4%) *Belarus (2020: 6,678 tons, 36%, 2021: 6,402 tons, 36%, 2022: 881 tons)
Tomato juice, unfermented, not containing added	1,633ton	\$1,039,500	- Moldova (24%) - Israel (18%) - United States (17%) - Germany(16%) - Lithuania(6%) *Belarus (2020: 1,304 tons, 32%, 2021: 983.9 tons, 27%, 2022: 45.1 tons, 5%)

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>). Note: Due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. However, as it was a major trading partner before the invasion, it is listed for reference to past trends.

(3) Cabbage

In 2024, cabbage imports amounted to approximately 26,000 tons (approx. 21.07 million USD), most of which were fresh products. The main supplying countries were North Macedonia and Poland. Although no separate category for processed products like sauerkraut is found in the WITS statistics, there are companies in Ukraine that manufacture and export these products.

Table 2.2.5 Import Volume, Value, and Key Supplying Countries for Cabbage (2024)

Item	Import Volume	Import Amount	Major Import countries (Share)
Cabbage, fresh or chilled	25,668ton	\$21,071,000	- North Macedonia (56%) - Poland (22%)

Source: JICA survey team based on WITS. (<https://wits.worldbank.org/CountryProfile/en/UKR>)

On the other hand, the export volume is extremely small compared to the import volume, and trade is limited to neighboring countries such as Romania and Moldova. Before the Russian invasion, Belarus was also a major trading partner, but trade has been suspended since 2022.

Table 2.2.6 Export Volume, Value, and Key Supplying Countries for Cabbage (2024)

Item	Export Volume	Export amount	Major Export countries (Share)
Cabbage, fresh or chilled	601ton	\$253,000	- Moldova(84%) - Romania (14%) *Belarus (2020: 3,751 tons, 80%, 2021: 4,395 tons, 56%, 2022: 1,001 tons, 98%)

Source: JICA survey team based on WITS. (<https://wits.worldbank.org/CountryProfile/en/UKR>). Note: Due to the impact of the Russian invasion, trade with Belarus has been suspended since 2022. However, as it was a major trading partner before the invasion, it is listed for reference to past trends.

The trade of the target items in 2024 is characterized by imports covering a wide range of products, while exports are limited to specific items. In particular, fresh products account for a large volume of imports and are central to the supply. Exports, on the other hand, are centered on specific processed goods, such as "Potato starch" and "Tomatoes, preserved otherwise than by vinegar," with main destinations being neighboring countries. As for cabbage, there is almost no trade in processed goods, and a stable import for the domestic market continues.

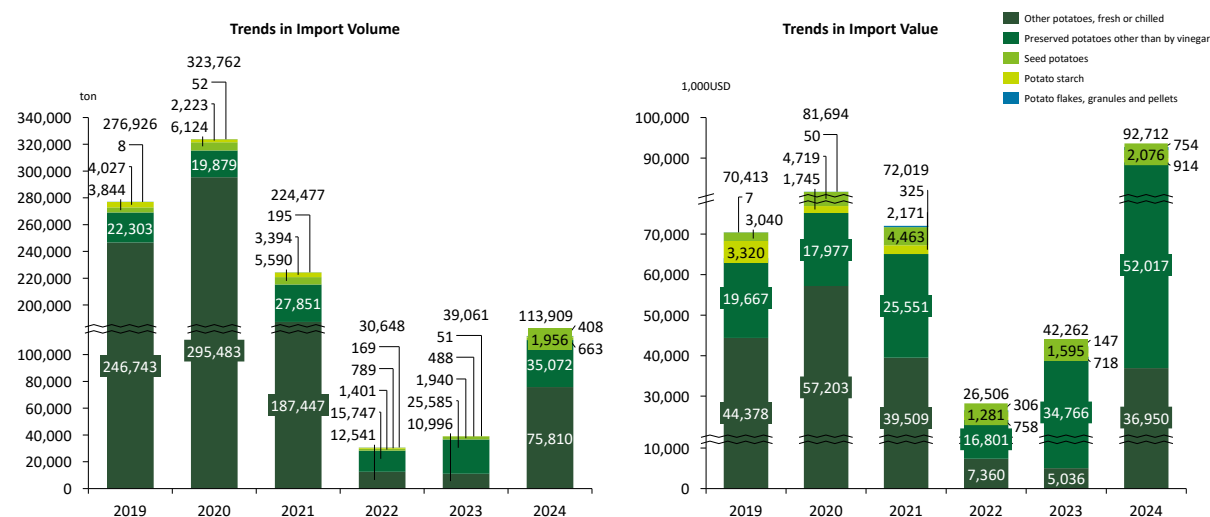
2.2.4 Import

(1) Potatoes

A chronological analysis of Ukraine's potato import trends reveals significant changes in both import volume and the composition of items following the Russian invasion in 2022. A notable shift in the composition of imported products has been observed. Prior to 2022, imports were predominantly comprised of low-priced fresh or chilled potatoes. Since 2023, however, the share of highly preservable processed products, such as canned goods, has increased.

This transformation is also reflected in the total import value. After declining from approximately 82 million USD in 2020 to 27 million USD in 2022, the value subsequently surged to a record high of approximately 93 million USD in 2024. This increase was recorded despite the import volume being

only about one-third of its peak level and is attributed to a sharp rise in the average unit price. Contributing factors to this price increase include the shift from inexpensive fresh products to higher-priced processed goods, as well as global food inflation and rising transportation costs. In summary, Ukraine's potato imports have undergone a substantial transformation in terms of volume, product composition, and total value in the period since the Russian invasion.



Source: JICA survey team based on WITS. (<https://wits.worldbank.org/CountryProfile/en/UKR>)

Figure 2.2.6 Trends in Import Volume and Value of Potatoes

(2) Tomatoes

Ukraine's tomato imports demonstrated a consistent upward trend between 2019 and 2024. During this period, the import volume increased by approximately 1.5 times, growing from around 78,000 tons in 2019 to 120,200 tons in 2024. Concurrently, the total import value surged by approximately 2.9 times, from roughly 56 million USD to 164 million USD. The growth in value significantly outpaced the growth in volume, indicating a substantial rise in the average unit price of imported tomatoes.

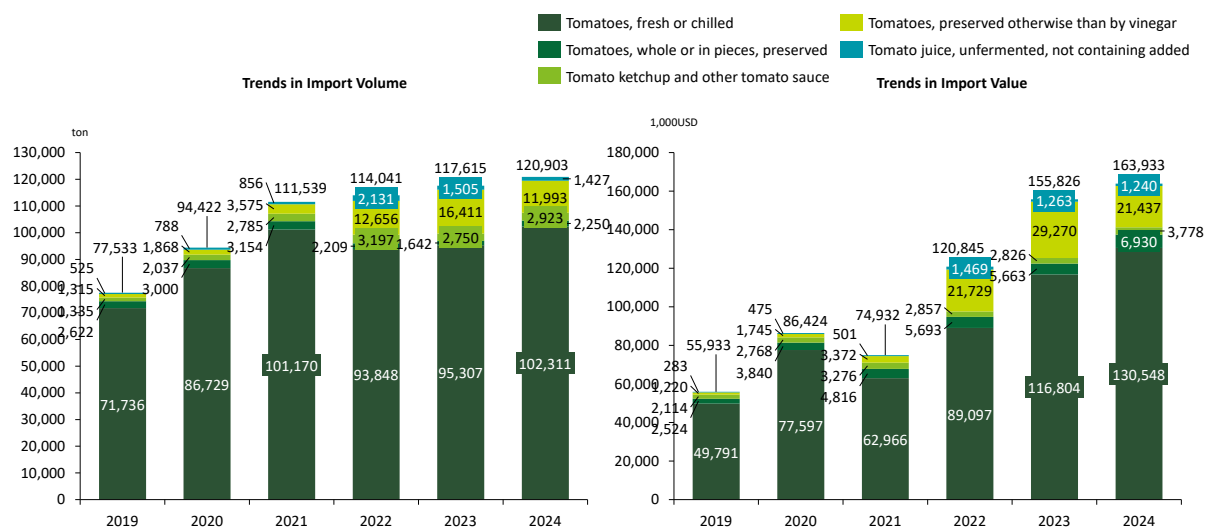
An examination of the product breakdown reveals that this price increase is partly driven by a shift in import composition. While fresh or frozen tomatoes remain the primary import category, imports of processed products such as puree, juice, and ketchup have also expanded in both volume and value. In 2024, for instance, Ukraine imported approximately 12,000 tons of tomato puree (valued at 21 million USD) and 3,000 tons of ketchup (valued at 3.8 million USD). The growing share of these higher-value processed goods has contributed to the overall increase in total import value.

In a separate development, in 2024¹², a Ukrainian domestic producers' association raised concerns that fresh tomatoes and cucumbers from Türkiye were being imported at unfairly low prices, adversely affecting the business of local farmers. In response to a petition from the association, the Government of Ukraine initiated an anti-dumping investigation to determine whether Turkish fresh tomatoes were

¹² Sayenko Kharenko. "Sayenko Kharenko successfully initiated anti-dumping investigation against imports into Ukraine of cucumbers and tomatoes with origin in Turkey." 2024-05-20. <https://sk.ua/sayenko-kharenko-successfully-initiated-anti-dumping-investigation-against-imports-into-ukraine-of-cucumbers-and-tomatoes-with-origin-in-turkey/>. (Accessed 2025-07-28).

being imported in large quantities at excessively low prices and causing injury to the domestic industry. This investigation culminated in the decision to impose a 26.9% anti-dumping duty on fresh tomatoes from Türkiye, effective from July 2025¹³. This measure is intended to protect domestic producers from the impact of low-priced imports.

These trends indicate that Ukraine relies on a diverse range of products from major supplying countries to meet its domestic market demand for both fresh and processed tomatoes. The imposition of the anti-dumping duty on Turkish fresh tomatoes is a significant development, and its future implications for the import structure and domestic production will be a key area to monitor.



Source: JICA survey team based on WITS. (<https://wits.worldbank.org/CountryProfile/en/UKR>)

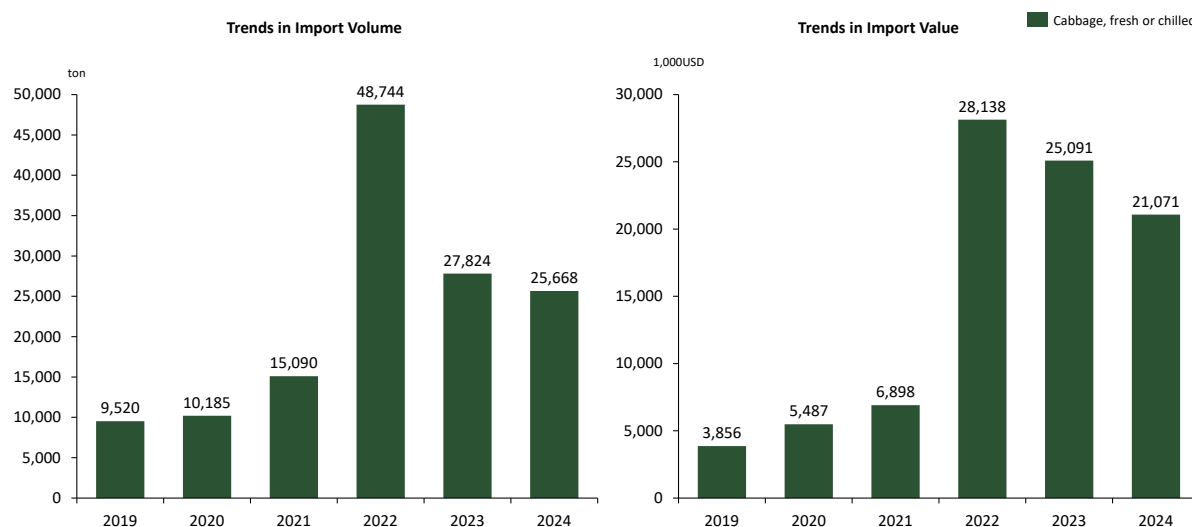
Figure 2.2.7 Trends in Import Volume and Value of Tomatoes

(3) Cabbage

Ukraine's cabbage imports surged to an exceptional level of approximately 49,000 tons in 2022, marking a significant peak compared to previous years. This sharp increase is analyzed as a crisis-response measure to compensate for the domestic supply shortage caused by the severe disruption of major production areas and logistics networks following the Russian invasion.

However, imports subsequently entered a downward trend, decreasing to approximately 26,000 tons by 2024. This decline suggests that the domestic production system is demonstrating a degree of resilience, and that the state of excessive import dependency observed in 2022 is gradually being corrected.

¹³ Sayenko Kharenko. "Sayenko Kharenko successfully represented the greenhouse industry in the anti-dumping investigation related to imports into Ukraine of fresh cucumbers and fresh tomatoes originating in the Republic of Turkey." 2025-07-15. <https://sk.ua/sayenko-kharenko-successfully-represented-the-greenhouse-industry-in-the-anti-dumping-investigation-related-to-imports-into-ukraine-of-fresh-cucumbers-and-fresh-tomatoes-originating-in-the-republic-of/>, (Accessed 2025-07-28).



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>).

Figure 2.2.8 Trends in Import Volume and Value of Cabbage

2.2.5 Export

(1) Potatoes

Ukraine's potato exports, after experiencing a temporary surge from 2021 to 2023, shifted to a severe decline in 2024, revealing significant challenges to their sustainability.

Export volume, which stood at a modest level of 4,300–6,000 tons between 2019 and 2020, increased dramatically to approximately 20,000 tons in 2021 and 46,000 tons in 2023. However, it then plummeted to around 8,800 tons in 2024, indicating that the recent growth was highly volatile. During this period, exports of starch also expanded alongside fresh potatoes.

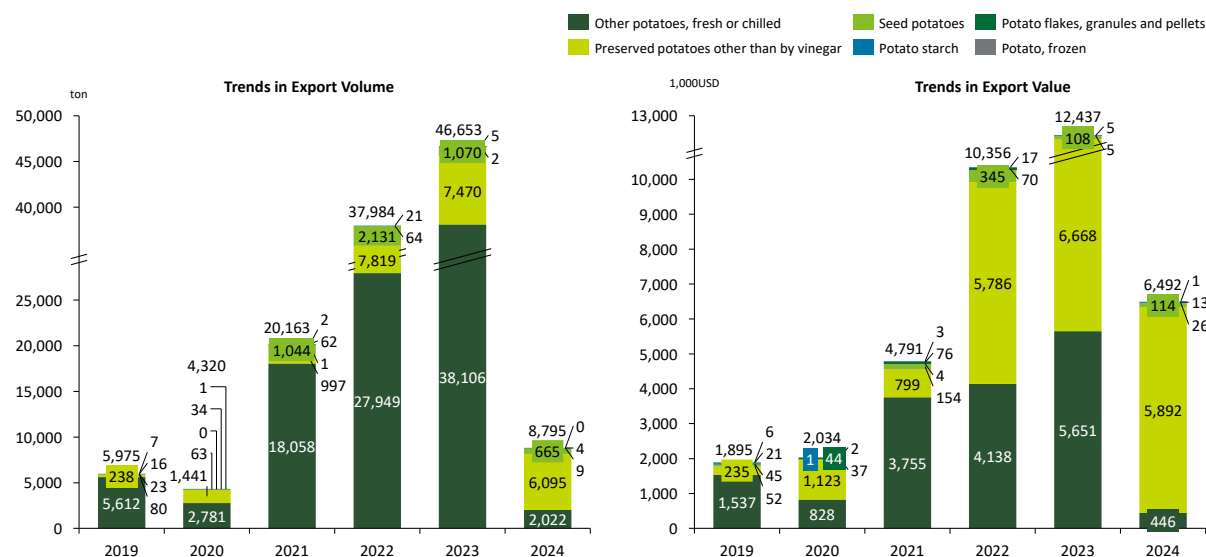
Given that domestic potato production has not seen major fluctuations, this sharp volatility in export volume is analyzed as being attributable primarily to external factors. The drastic decrease in 2024 was immediately triggered by a significant reduction in trade with Moldova, a key trading partner, and the complete suspension of trade with Belarus since 2023. This has exposed the vulnerability stemming from over-reliance on a few neighboring markets.

Furthermore, a more structural issue lies in the quality of Ukrainian potatoes. Several international agricultural expert organizations, including economists from the FAO, have pointed out that Ukrainian potatoes do not meet the quality standards required by the international market due to deficiencies in post-harvest handling, such as washing, sorting, and packaging. It is highly probable that this fundamental quality issue is the primary impediment to stabilizing trade and penetrating new markets¹⁴.

Based on this analysis, it is imperative for Ukraine to build a sustainable export foundation rather than depending on short-term transactions to establish potato exports as a stable source of revenue.

¹⁴ POTATO BUSINESS. "Record Potato Exports for the Ukrainian Farmers". 2023-09-19. <https://www.potatobusiness.com/market/record-potato-exports-for-the-ukrainian-farmers/>, (Accessed 2025-08-20).

Specifically, the diversification of export destinations and the strengthening of quality management systems to enhance international competitiveness are urgent priorities. In conclusion, modernizing post-harvest technology and promoting the development and production of high-value-added processed goods are identified as key strategic challenges for the future.



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>).

Figure 2.2.9 Trends in Export Volume and Value of Potatoes

(2) Tomatoes

Exports of Ukrainian tomatoes and related products have entered a clear downward trend since 2021, and have been experiencing severe stagnation, particularly after the Russian invasion in 2022. This trend highlights not only production-side issues but also structural vulnerabilities in the export market.

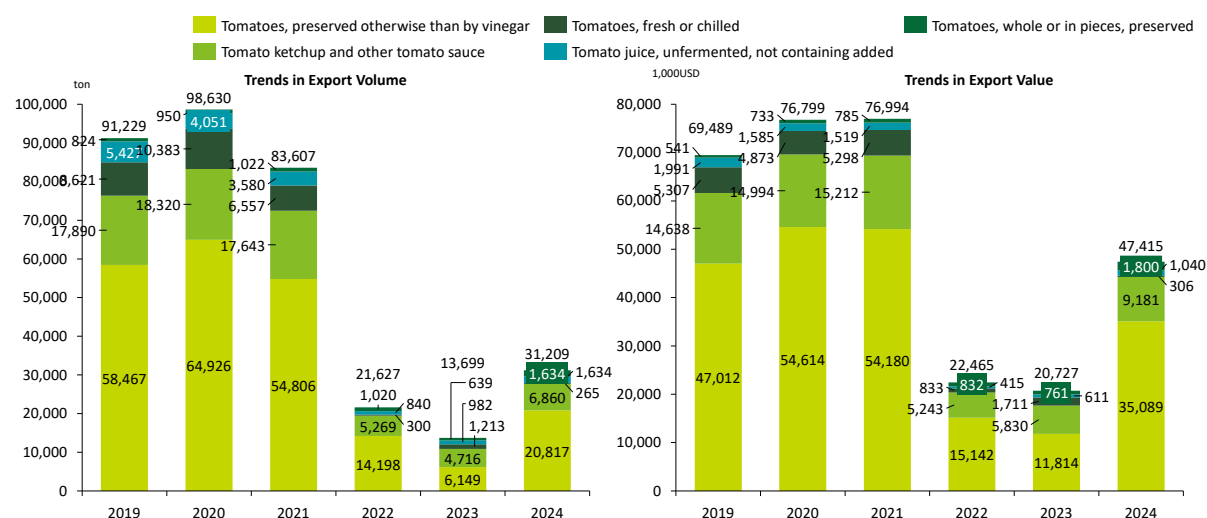
After increasing from 2019 to 2020, export volume began to decline from 2021 onward. Notably, in 2022, export volume plummeted to about one-quarter of the previous year's level, confirming that the sector suffered a devastating blow. Although slight signs of recovery were observed in 2024, the volume remains far below pre-invasion levels.

The direct cause of this export collapse lies in the changing relationships with key trading partners. The suspension of trade with Belarus, which had been a crucial market for fresh tomatoes, ketchup, and juice, and a significant decrease in exports to Poland, the main destination for tomato puree, were the decisive factors that drove down the overall figures. This clearly demonstrates that the export structure, which was overly dependent on a few neighboring markets, was rendered dysfunctional when geopolitical risks materialized.

This stagnation is severe across product categories as well. Tomato puree, which had been the backbone of exports, fell to approximately 6,100 tons in 2023. Although it recovered to around 21,000 tons in 2024, this volume is only about 65% of the peak level recorded in 2021.

In conclusion, for Ukraine's tomato exports to return to a recovery path, it is analyzed that prioritizing

the restoration of the production system and promoting the diversification of export markets are essential.



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>).

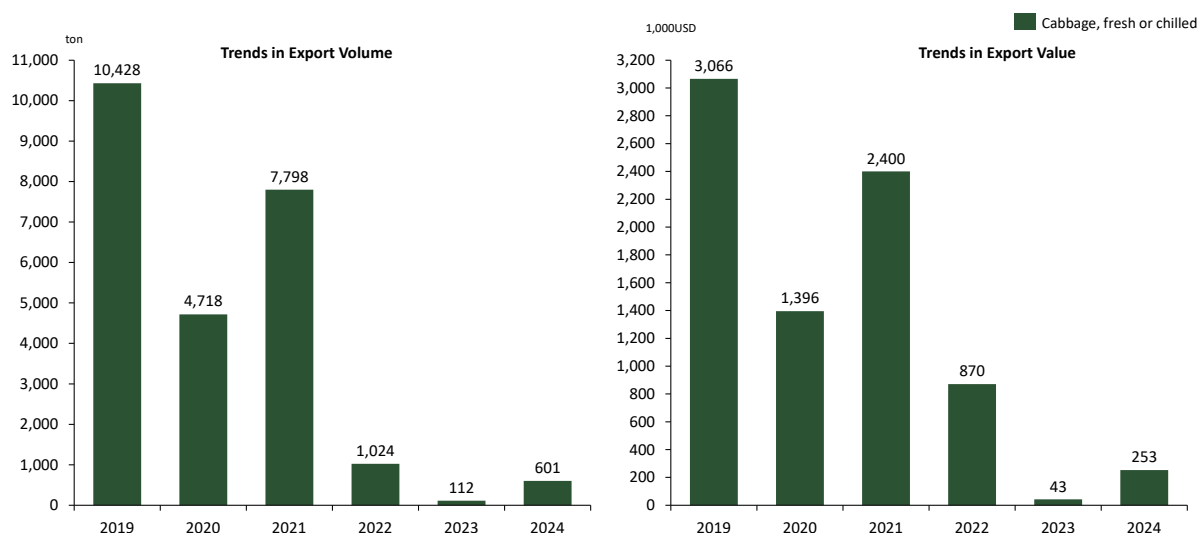
Figure 2.2.10 Trends in Export Volume and Value of Tomatoes

(3) Cabbage

Ukraine's fresh cabbage exports have been on a long-term downward trend since their peak in 2019, rooted in a structural vulnerability of extreme dependence on a single market.

Export volume has decreased annually, falling to approximately 601 tons by 2024, with export value recording a similarly sharp decline. An analysis of this export structure reveals a conspicuous and extraordinary dependence on the Belarusian market. From 2019 to 2022, Belarus consistently accounted for 30% to 55% of total export volume, making it the largest trading partner. This reliance intensified over the years, culminating in an extremely skewed structure in 2022, where 1,001 tons out of a total of 1,024 tons—over 97%—were concentrated in Belarus alone.

Consequently, the complete cessation of this trade with Belarus from 2023 onward was the direct factor that dealt a devastating blow to Ukraine's cabbage export market. This case clearly illustrates the classic risk of a market concentration strategy, where the loss of a single sales channel due to external factors, such as geopolitical risks, can cause the entire export function for that commodity to collapse.



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>).

Figure 2.2.11 Trends in Export Volume and Value of Cabbage

2.3 Detailed Analysis of Value Chains by scale of producers

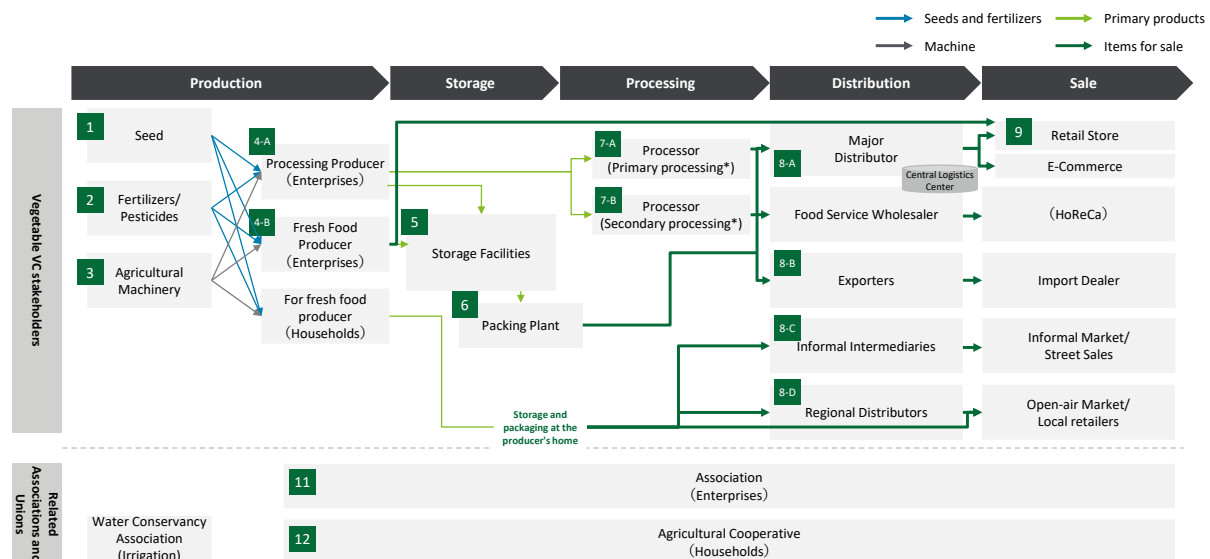
2.3.1 Value Chain Structure

The value chain for potatoes, tomatoes, and cabbage in Ukraine is comprised of six stages, from procurement to sales. Its actual structure differs markedly depending on the scale of operation, forming a dichotomy between a modern structure led by large-scale enterprises and a traditional structure primarily sustained by small-scale enterprises and households.

The modern structure represents an integrated value chain led by large-scale enterprises, oriented towards supplying the formal market. It enhances value-addition through planned, commercial-scale production, quality management in modern storage facilities, and processing conducted either by the producers themselves or by specialized firms. Products are then efficiently distributed to national supermarkets, the HoReCa sector (hotels, restaurants, and cafés), and export markets via formal channels such as wholesalers and exporters.

In contrast, the traditional structure is centered on small-scale farmers and households and is largely rooted in local markets. A key feature of this structure is the general absence of a commercial processing stage. Produce is either sold to local retail stores or washed and packed by the producers themselves for direct sale at open-air markets or through roadside stalls. Access to large-scale, formal commercial markets such as supermarkets is highly restricted, often due to barriers like business registration procedures, and the involvement of informal intermediaries is common.

In conclusion, the two value chains are defined by critical differences: the presence or absence of a processing stage, and the scale and formality of the commercial markets they access. A deep understanding of this dualistic structure is essential for devising tailored approaches that address the distinct characteristics of each.



Source: JICA survey team

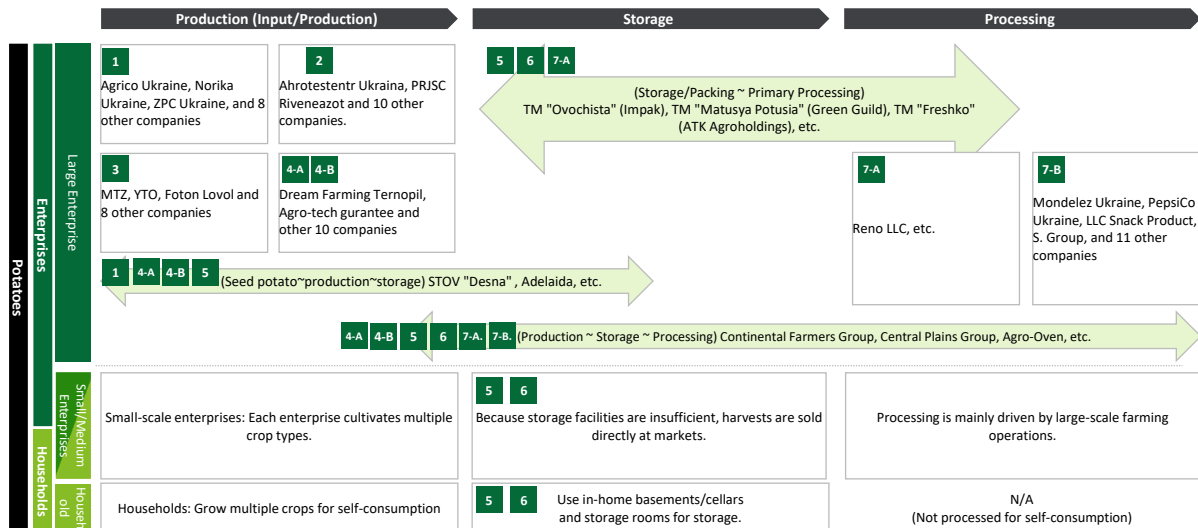
Figure 2.3.1 Value Chain Structure

Based on the study findings, a stakeholder map covering the stages from production to processing for potatoes, tomatoes, and cabbage is presented below.

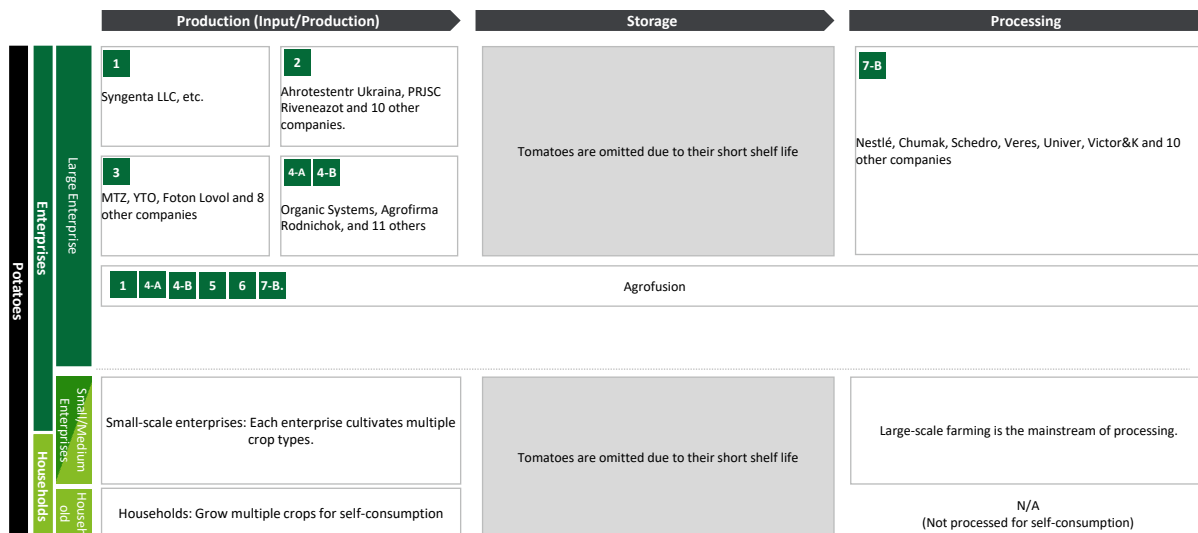
This duality of "modern" and "traditional" structures, observed in Ukraine's vegetable value chains, is also clearly evident in the availability of information regarding stakeholders.

The desktop survey, based on publicly available information, successfully identified major large-scale enterprises engaged in the stages of production, storage, and processing. Many of these companies were found to be involved in multiple stages of the value chain. For all three commodities—potatoes, tomatoes, and cabbage—enterprises that handle the entire process from production through storage to processing were confirmed. This fact indicates that large-scale operators are adopting a vertically integrated business model to enhance supply chain efficiency and control. This can be concluded to be the concrete business form of the aforementioned "modern structure."

On the other hand, publicly available information on small- and medium-scale enterprises (SMEs) and households is extremely limited, making it difficult to identify individual business entities or farmers by name. Therefore, the analysis of these stakeholders in the present study is confined to a macro-level assessment of general trends.

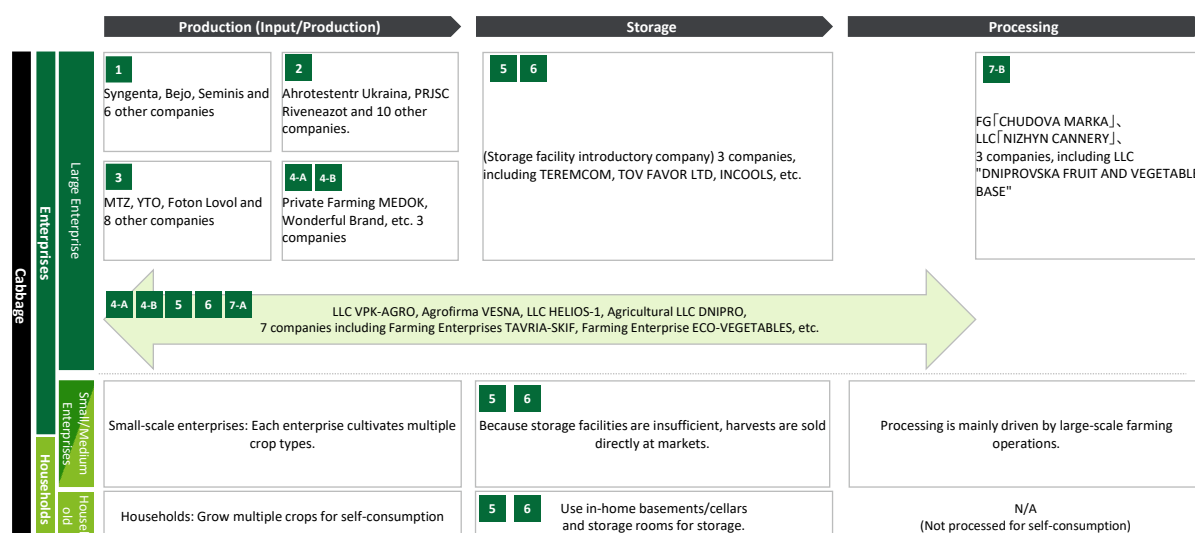


Source: JICA survey team

Figure 2.3.2 Potatoes Value Chain Structure

Source: JICA survey team

Figure 2.3.3 Tomatoes Value Chain Structure



Source: JICA survey team

Figure 2.3.4 Cabbage Value Chain Structure

2.3.2 Procurement

The major companies involved in the procurement of seeds and seed potatoes in Ukraine are shown below.

(1) Seed Production Companies (Potatoes, Tomatoes, Cabbage)

Seed suppliers in Ukraine procure seeds through imports from abroad and self-propagation and supply them to agricultural producers.

Table 2.3.1 Major Seed Production Companies (Potatoes, Tomatoes, Cabbage)

Company Name	Overview	Items handled			Head Office
		Potatoes	Tomatoes	Cabbage	
Syngenta LLC	• It has a Ukrainian branch in Kyiv and is engaged in a wide range of seed production.	○	○	○	Switzerland
Sakata Vegetables Europe SAS	• It is a subsidiary of Sakata Seed Co., Ltd., which breeds, produces, and sells high-quality vegetable seeds for Europe, the Middle East, and Africa.	○	○	-	France
LLC "Hazera Ukraine"	• Develop a wide range of seed varieties and provide comprehensive support every step of the way	○	○	-	Netherlands Israel
May Agro	• A leading Turkish company that researches, produces, and trades seeds for vegetable and feed crops, and also operates in Ukraine	-	○	-	Turkey
Enza Zaden	• Developing high-quality vegetable varieties	-	○	-	Netherlands
Advanta Seeds International	• The company produces and researches seeds such as sunflowers, wheat, and vegetables, and expands its business to the EU and Russia.	N/A	N/A	N/A	U.A.E
Rijk Zwaan	• Growing seedlings of new varieties of fruits and vegetables	○	○	-	Ukraine
VLADAM YUG	• Distributor of the French seed company HM.Clause, providing knowledge and tools to support cultivation	○	○	-	Ukraine
BASF	• Involved in seed production and research and development	-	○	-	Ukraine

Source: JICA survey team based on D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>) Note: For information on the supply of various seeds, refer to the respective company websites (Syngenta (<https://www.syngenta.ua/>), Sakata (<https://sakata-vegetables.eu/>), LLC Hazera Ukraine (<https://ua.hazera.com/>), May Agro (<https://ukrseeds.org.ua/en/may-agro>), Enza Zaden (<https://www.enzazaden.com/us>), Rijk Zwaan (<https://rijkszwaan.com/en/home>), Vladam Yug (<https://vladam-seeds.com.ua/>), BASF (<https://www.basf.com/ua/uk>)).

(2) Seed Potato Production Companies (Potatoes)

The business models of seed potato production companies in Ukraine vary depending on their capital structure. Foreign-affiliated companies with headquarters in the Netherlands or Germany import certified seed potatoes from abroad for multiplication and sale within the country. In contrast, Ukrainian-capitalized companies handle the entire process from breeding to production and sales domestically.

Table 2.3.2 Major Seed Potato Production Companies (Potatoes)

Company Name	Sales	Overview	Head Office
Agrico Ukraine	€34 million (seed potato)	• Import of certified seed potatoes from the Netherlands and propagation and sale of seed potatoes (for edible potatoes and processing)	Netherlands
Norika Ukraine	N/A	• Breeding of potato varieties and production of seed potatoes	Germany
HZPC Ukraine	N/A	• Supply of high-quality seed potatoes	Netherlands
Solana Ukraina/Logistica	N/A	• Supply of seed potatoes and operation of seed potato storage facilities (7,000 tons)	Germany
Continental Farmers Group	N/A	• Agro Holdings, based in western Ukraine. Produces seed potatoes and potatoes for large-scale management entities.	Ukraine
PJSC Chernihivlitkartoplya	N/A	• Seed potatoes are produced based in the Chernihiv region. For large business entities.	Ukraine
STOV "Desna"	N/A	• Based in the Chernihiv region, seed potatoes are produced. Small, medium, and large-scale management entities are also supported.	Ukraine
FG "Adelaida"	N/A	• A family-run farm based in the Kherson region. Producing high-quality seed potatoes for SMEs	Ukraine

Source: JICA survey team based on respective company websites (Agrico Ukraine (<https://www.agrico.com.ua/>), Norika Ukraine (<https://norika-ua.com/uk/pro-kompaniyu/>), HZPC Ukraine (<https://www.hzpc.com/our-locations/ukraine>), Solana Ukraina (<https://solana-group.com/en/>), Continental Farmers Group (<https://cfg.com.ua/en/>), PJSC Chernihivlitkartoplya (<https://www.elitkartofel.com/>), STOV Desna (<https://www.facebook.com/DesnaSTOV/>)).

(3) Seed Potato Distribution Companies (Potatoes)

Seed potato distribution companies play the role of procuring seed potatoes from production companies and selling them through a wide range of sales channels, from large-scale customers like agricultural corporations to individual consumers.

Table 2.3.3 Major Seed Potato Distribution Companies (Potatoes)

Company Name	Sales	Distributions	Head Office
Vesnodar	N/A	• Agrico Ukraine, Solana, Europlant, NAAS Seed Potato Retail	Ukraine
Dobri Skhody	N/A	• Seed potato retail in Agrico Ukraine, Solana, Europlant, NAAS, IPM Potato	Ukraine
Profesiynе Nasinnia	N/A	• Seed potato retail in Agrico Ukraine, HZPC Holland, NAAS, IPM Potato	Ukraine

Source: JICA survey team based on respective company websites (Vesnodar (<https://vesnodar.com.ua/ua>), Dobri Skhody (<https://dsh.com.ua/semena-ovoshchey/>), Profesiynе Nasinnia (<https://darnasinya.com.ua/profesiine-nasinnia/>)).

(4) Fertilizer and Agrochemical Companies (Potatoes, Tomatoes, Cabbage)

Fertilizer and agrochemical companies in Ukraine manufacture their products domestically and distribute them to agricultural producers. These companies strive to enhance product quality management and their supply systems to meet local agricultural demand. Furthermore, a stable supply of fertilizers and agrochemicals contributes to maintaining and improving agricultural production¹⁵.

¹⁵ UKRAINIAN NEWS. "Rivneazot Stops Fertilizers Production After Russian Attack On Energy Infrastructure Facilities In Rivne". 2022-10-23. <https://ukranews.com/en/news/889753-rivneazot-stops-fertilizers-production-after-russian-attack-on-energy-infrastructure-facilities-in>, (Accessed 2025-07-25).

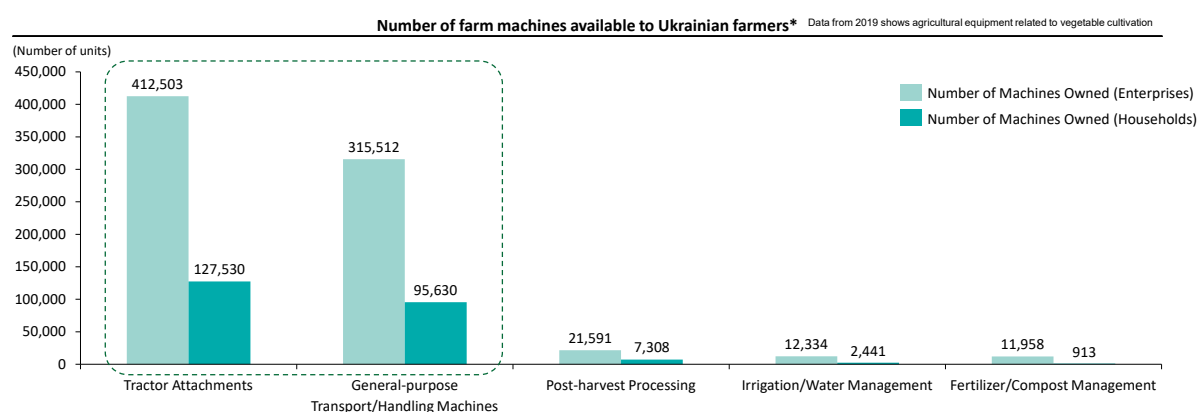
Table 2.3.4 Fertilizer and Agrochemical Companies (Potatoes, Tomatoes, Cabbage)

Company Name	Sales (USD)	Overview	Head Office
AHROTSENTR UKRAINA TOV	61.22M	• Manufacture and distribute a wide range of fertilizers and pesticides such as organic fertilizers, soil insecticides, and fungicides.	Ukraine
PRJSC "RIVNEAZOT" JSCo	48.99M	• Production of organic fertilizer (ammonium nitrate) in the Rivne region	Ukraine
BALANS AHRO TSENTR TOV	25.42M	• Organic fertilizer for seeds/production of animal feed	Ukraine
AHROKHIM TEKHNOLODZHI TOV	24M	• Production of pesticides and fertilizers	Ukraine
JSC "OPP" JSCo	21.14M	• Manufacture of nitrogen fertilizers and other plastic products	Ukraine
ALTEIA FARM INVEST TOV	19.68M	• Production of pesticides, fertilizers, and other basic chemicals	Ukraine
RESEARCH-AND-PRODUCTION COMPANY KVADRAT LLC	17.52M	• Manufacture and sales of special fertilizers and auxiliary agents	Ukraine
ZAVOD BIODOBRYV TRYVKO TOV	17.50M	• Production of pesticides and fertilizers	Ukraine
"UTK CHEMALLIANCE" LLC	12.35M	• Production of liquid and granular fertilizers	Ukraine

Source: JICA survey team based on defining the top 10 companies by sales in D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>) as major fertilizer and agrochemical companies. Note: For information regarding supply, refer to the official websites of the respective companies (AHROTSENTR UKRAINA TOV (<https://ahrotsentr.com.ua/ua/>), PRJSC RIVNEAZOT JSCo (<http://www.ostchem.com/en/o-kompanii/proizvodstvo/rovno>), BALANS AHRO TSENTR TOV (<https://www.balansagro.com/>), RESEARCH-AND-PRODUCTION COMPANY KVADRAT LLC (<https://quantum.ua/ua>), UTK CHEMALLIANCE LLC (<https://utk.in.ua/>)).

(5) Agricultural Machinery and Equipment

According to 2019 data from the State Statistics Service of Ukraine, approximately 95% of the registered agricultural machinery and equipment in the country consisted of tractor attachments and general-purpose transport equipment. This figure represents an overall agricultural trend and does not have a breakdown by crop.



Source: JICA survey team based on the State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 2.3.5 Number of Agricultural Machines Available to Ukrainian Farmers (2019)

The ownership status of major agricultural machinery in the country is as follows. Regarding tractor attachments, harrows, cultivators, and seeders are predominant. For general-purpose mobile and transport equipment, tractors and wheeled tractors are mainly utilized.

Table 2.3.5 Major Agricultural Machinery Categories and Ownership in Ukraine

:Top 5 in all agricultural machinery

Category name	Agricultural Machinery Names	Numbers Owned by Households	Numbers Owned by Enterprises
Irrigation and water management	Machines and equipment for irrigation	698	2,717
	Water pumps and water-pumping stations	906	5,010
	Water-sprinklers	837	4,607
Fertilizer and compost management	Manure conveyers	913	11,958
Post-harvest treatment	Post-harvest machinery and equipment	7,308	21,591
General purpose transport machine	Tractors	41,780	130,529
	Wheel tractors	38,479	119,178
	Two-wheel (walking) tractors	354	1,005
	Trailers, semitrailers	15,017	64,800
Tractor attachments	Disk harrows	13,862	34,780
	Harrows	35,660	160,004
	Ploughs	19,650	51,447
	Cultivators	25,308	71,633
	Seeders	24,319	66,511
	Combines beet (except beet tops cutting machines)	361	1,560
	Combines potato, including potato-diggers	393	949
	Machines harvesters for vegetables and melon grains	0	436
	Potato-planters	692	1,305
	Spreaders of manure and fertilizers	7,285	23,878

Source: JICA survey team based on the State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>).

The major companies and distributors of agricultural machinery (tractors) in Ukraine are organized below.

Table 2.3.6 Major Tractor Companies and Distributors (Potatoes, Tomatoes, Cabbage)

Company Name	Distributor	Head Office
MTZ	Техноторг(Technotorg), Автек(Avtek)	Belarus
UTO	ТРАНС АГРО МАРКЕТ(TRANSAGROMARKET), ЮТО Україна(UTO-UKRAINE LLC), Про компанію(K24), Білоцерківмаз(LLC SPE KHERSONSKIY MASHINOSTROITEL'NIY ZAVOD)	China
Foton Lovol	Техноторг(Technotorg), Агро-Союз-Київ(Agrosoyuz)	China
New Holland	Полетехніка (Poletechnika), Техноторг(Technotorg), Агропесури(Agroresurs), А-Терра(A-Terra)	Europe/US
CLAAS	Ерідон Тех(Eridon Tech), Компанія ЛАН(Company LAN), Агротехсоюз(Agrotechsoyuz), ТМІ(TMI)	Europe/US
John Deere	РДО Україна(RDO Ukraine), Агросолар(Agrosolar), Агрістар(Agristar), Агротек(Agrotec), Ландтех(Landtech)	Europe/US
Case IH	Titan Machinery(Titan Machinery), НФМ Агро(NFM Agro), Агроальянс(Agroalliance), АГСОЛКО (AGSOLCO)	Europe/US
Fendt	Агросструктура (Agrostructura), Ценеллін(Tsepellin), Астра(Astra), Агроспейс(Agrospase)	Europe/US

Source: JICA survey team based on MAFF's "FY2023 Commissioned Project for Supporting the Recovery of Agricultural Production Capacity in Ukraine (Basic Survey for the Recovery of Agricultural Production Capacity)" (https://www.maff.go.jp/j/pr/event/attach/pdf/kaigi_release_2501-16.pdf)

2.3.3 Production

The major producers of potatoes, tomatoes, and cabbage in Ukraine are listed below.

(1) Potatoes

The main producers of potatoes are in the central-eastern, western, and central-western regions of Ukraine.

Table 2.3.7 Major Potato Producers

Company Name	Area (ha)	Region	Oblast
Agro-Oven	664	Central-East	Dnipropetrovsk
DREAM FARMING TERNOPIL	603	West	Ternopil
Adelaida, SFG	486	Central-West	Zhytomyr
AGROTECH-GUARANTEE	411	Central-East	Poltava
Pluzhne Lyceum of the Khmelnytskyi Regional Council	317	Central-West	Khmelnytski
"AVANT-GARDE NAMED I.I.	317	Central-East	Chernihiv
FARM "ADELAIDA" SECLUDED ESTATE	307	South	Kherson
AGROFIRMA OST	300	Central-East	Chernihiv
SAUSAGE FARM OF VICTOR OLEGOVICH	300	Central-East	Chernihiv
AGROFIRMA "KYIVSKA	285	Central-West	Kyiv

Source: JICA survey team based on Tripoli (<https://tripoli.land/ua/farmers>). Note: The top 10 potato producers by area were selected.

A key characteristic of major seed potato production in Ukraine is the clear distinction between varieties used for fresh consumption and those for processing. For fresh potatoes, early-maturing varieties with a short growing period, such as Riviera, Arena, Rosara, Collette, and Alouette, are widely used. Production is centered around large-scale producers like Adelaida SFG, Continental Farmers Group, Agrofirma Kyivska, and Agro-Oven. These varieties are selected for their ease of freshness preservation and high market demand.

On the other hand, for processing potatoes, mid-season to late-maturing varieties such as Belmondo, Fontane, Spectra, and Arena are mainly used, with production concentrated among Continental Farmers Group, Adelaida SFG, Agrofirma OST, and contract farmers. These varieties are chosen for their high starch content and superior processing suitability, including shape and storability, for products like potato chips and french fries.

Table 2.3.8 Major Seed Potato/Potato Production Companies by Variety

Purpose	Popular varieties	Major seed Potato Production Companies	Major Potato Producing Companies
For fresh use	Riviera, Arena, Rosara, Colette, Arouette	Agrico, HZPC, Norika, Solana	Adelaida, Continental Farmers Group, Kyivska, Agro-Oven
For processing	Belmond, Fontane, Spectra and Arena (partial)	Agrico, HZPC, Norika, Solana	Continental Farmers Group, Adelaida, Agrofirma OST, Contract Farmers

Source: JICA survey team based on Potato Pro's "Database of All Potato Varieties" (<https://www.potatopro.com/about/database-all-potato-varieties>)

(2) Tomatoes

The main producers of tomatoes are in the southern part of Ukraine.

Table 2.3.9 Major Tomato Producers (Open-field Cultivation)

Company Name	Area (ha)	Region	Oblast
Private Enterprise "Organic Systems"	1,125	South	Kherson
Private Agricultural Enterprise "Agrofirma Rodnichok"	850	South	Mykolaiv
Farm South	220	South	Kherson
Limited Liability Company "Shevchenko Agrofirma"	205	South	Kherson
Limited Liability Company "Pivdenyagroperobobka"	175	South	Odesa
Agrofirma Evrika	150	South	Odesa
Private Enterprise "Aleksandr A Synenko"	141	South	Kherson
Private Agricultural Enterprise "Tavria-Agro"	130	South	Kherson
FARM "AGRICULTURAL PRODUCT"	130	South	Kherson
Farm Melnyk	113	South	Mykolaiv
Private Agricultural Enterprise "Diamant"	110	South	Odesa

Source: JICA survey team based on Tripoli (<https://tripoli.land/ua/farmers>). Note: The top 10 potato producers by area were selected.

Table 2.3.10 Major Tomato Producers (Greenhouse Cultivation)

Company Name	Area (ha)	Region	Oblast
Private Joint Stock Company "Greenhouse Combine"	35.3	Central-West	Kyiv
Limited Liability Company "Greenhouse Combine Dniprovskiy"	28.6	Central-East	Dnipropetrovsk
Limited Liability Company "Kherson Greenhouse Combine"	8.6	South	Kherson
Limited Liability Company "Agroconcern"	8.3	West	Rivne
Limited Liability Company "Soteko"	4.8	West	Lviv
Private Leased Agricultural Enterprise "Uman Greenhouse Combine"	4.5	Central-West	Cherkasy
Private Joint Stock Company "Greenhouse Combine"	3.2	Central-East	Sumy
Limited Liability Company "Skvyrsky Bread Products Combine"	3.0	Central-West	Kyiv
Limited Liability Company "Krasnodar Vegetable Factory"	3.0	East	Kharkiv
Limited Liability Company "Stryi Greenhouse"	3.0	West	Lviv

Source: JICA survey team based on Tripoli (<https://tripoli.land/ua/farmers>). Note: The top 10 potato producers by area were selected.

(3) Cabbage

The main producers of cabbage are in the central-eastern and central-western regions of Ukraine.

Table 2.3.11 Major Cabbage Producers

Company Name	Area (ha)	Region	Oblast
LLC "VPK-AGRO"	259.21	Central-East	Dnipropetrovsk
Farming Enterprise "TAVRIA-SKIF"	200	South	Zapozhzhia
LLC Agrofirma "VESNA"	126.07	Central-East	Dnipropetrovsk
Farming Enterprise "ECO-VEGETABLES"	58.5	Central-East	Dnipropetrovsk
Farming Enterprise "Selyanske (Private/Farming Enterprise) Druzhba"	50	East	Kharkiv
LLC "HELIOS - 1"	48.2	South	Kherson
Farming Enterprise "TRIUMPH"	47	Central-West	Khmelnitskyi
Private (Farming) Enterprise "MEDOK"	45	Central-East	Dnipropetrovsk
Farming Enterprise "WONDERFUL BRAND"	45	Central-West	Kyiv
Agricultural LLC "DNIPRO"	43.56	Central-West	Cherkasy

Source: JICA survey team based on Tripoli (<https://tripoli.land/ua/farmers>). Note: The top 10 potato producers by area were selected.

2.3.4 Storage

Regarding storage facilities, the situation for vegetables in general is presented first. The construction and operation of storage facilities involve construction companies handling the facility's structure, equipment manufacturers supplying various systems like refrigeration and air conditioning, and specialized companies providing items such as storage containers. The collaboration among these businesses in different fields aims to improve vegetable quality preservation and distribution efficiency.

Table 2.3.12 Vegetable Storage and Packing Facilities

Company Name	Corporate Structure	Main storage facilities	Storage Items	Storage Capacity (ton)	Head Office
Karkas Group LLC	Storage Facility Construction Company	• ZHYTOMYR BRANCH OF THE FARM "ADELAIDE" (Zhytomyr)	N/A	–	Zaporizhzhia
MAS Systems	Storage Equipment Manufacturers	• Shchedry Lan Farm (Lviv) • Agrofirma Dzvony (Lviv)	Potatoes Cabbage	1,000 3,000	Kyiv
Primeholod	Refrigeration Equipment Company for Facilities	N/A	N/A	–	Kyiv
Promstan Corporation	Storage Facility Construction Company	N/A	N/A	–	Mykolaiv
Planeta RS LLC	Storage Facility Construction Company	N/A	N/A	–	Kherson
Kholod Company LLC	Storage Facility Construction Company	N/A	N/A	–	Kharkiv
TERMOCOM	Storage Facility Construction Company	N/A	Potatoes Cabbage	Hundreds~ Thousands	Kyiv
INCOOLS	Storage Facility Construction Company	N/A	Potatoes Cabbage	Hundreds~ Thousands	Czech Republic
Isatex Invest Group	Construction Company	N/A	N/A	–	Zakarpacia
TOV FAVOR LTD	Storage Service Providers (Vegetable storage containers provided)	N/A	Cabbage	Hundreds~ Thousands	Kyiv

Source: JICA survey team based on respective company websites (Karkas Group LLC (<https://karkas24.com.ua/about-the-company/>), MAS Systems (<https://mas-ukraine.com.ua/obladnannya-ta-poslugi/sistemi-zber%dl%96gannya-fruktyv-ta-ovoch%dl%96v/sistemy-hranyeniya-ovoshhej/>), Primehold (<https://primeholod.com.ua/en/about-company/>), Promstan Corporation (<https://www.promstan.com.ua/en/istorija/>), Planeta RS LLC (<https://planetars.com.ua/en/our-objects/>), Kholod Company LLC (<https://holodprom.com.ua/>), TERMOCOM (<https://termocom.com.ua/ua/zberigannya-kapusti-v-ovocheshovishhi/>), INCOOLS (<https://east-fruit.com/en/news/a-rapid-reduction-in-the-supply-of-white-cabbage-provoked-a-price-rise-in-ukraine/>), <https://incools.com.ua/storage/cabbages/>), Isatex Invest Group (<https://isatex.ua/en/>)).

(1) Potatoes

1) Large-scale Enterprises

Large-scale enterprises tend to own and operate their own storage facilities and washing/packing lines.

Table 2.3.13 Large-scale Enterprise Potato Storage and Packing Facilities

Company Name	Storage capacity	Storage	Cleaning, sorting, packing	Oblast	Overview
Central Plains Group (CPG)	23,000ton	○	○	Lviv	• Establishment of a 23,000-ton potato storage facility and washing, sorting, packing, and processing lines in Lviv, which will be operational in 2021
STOV "Desna"	Existing 7,000 + new 8,000~10,000 ton	○	○	Chernihiv	• Large-scale in-house storage, doubling with new construction • (Existing 7,000 tons + new storage facility of 8,000~10,000 tons) (Washing, sorting, and packaging lines will also be introduced at the new facility)
Agro-Oven	N/A	○	○	Dnipropetrovsk	• Large-scale in-house storage, details not disclosed
Continental Farmers Group	N/A	○	○	Ternopil and others	• Large-scale in-house storage, details not disclosed
TM "Ovochista" (Impak)	N/A	○	○	Dnipropetrovsk	• Headquartered in Dnipro City and Main Plant Supplying Washed and Packaged Potatoes to Retail Chains Nationwide
TM "Matusya Potusia" (Green Guild)	N/A	○	○	Kyiv	• Large-scale washing and packaging plant in Brovary, Kyiv and nationwide expansion under the TM "Matusya Potusia" brand
TM "Freshko" (under ATK Agroholdings)	N/A	○	○	Kyiv	• Having washing and packing facilities in and around Kyiv City, the "Freshko" brand is shipped to supermarkets nationwide.

Source: JICA survey team based on respective company websites (Central Plains Group (<https://centralplains.co.uk/uk/about/>), STOV Desna (<https://www.facebook.com/DesnaSTOV/>), Agro-Oven (<https://www.agrooven.com.ua/en/home>), Continental Farmers Group (<https://cfg.com.ua/en/>), TM Ovochista (<http://www.impak.biz.ua/>) and Agroberichten Buitenland (<https://www.agroberichtenbuitenland.nl/actueel/nieuws/2022/12/12/potato-sector-of-ukraine>).

2) SMEs and Households

It is difficult for SMEs and households to own their own large-scale, dedicated vegetable storage facilities due to the high costs of construction and maintenance. Therefore, the development of communal storage facilities promoted by local governments and international organizations plays a crucial role. For households, since the primary purpose is home consumption, it is common to store vegetables in household pantries or cellars¹⁶.

Table 2.3.14 Small- and Medium-scale Enterprise and Household Potato Storage and Packing Facilities

Initiative name	Storage	Washing, Sorting, and Packing	Region/Oblast	Storage Capacity and Overview	Entity and Management form
FAO-supported Joint Storage	○	N/A	10 Ukrainian Oblasts (Eastern, Central, Southern, and Northern)	• Simple storage for SMEs (made of polyethylene), prefabricated storage for medium-sized cooperatives	FAO/Local Unions
Community Storage Facility	○	N/A	Chernihiv, etc.	• Built with the support of USAID, etc. Up to 10,000 tons (under construction and planning) with washing, sorting and packing lines	Municipal, Private (LNZ), USAID
SMEs and Household (in general)	○ (Stored in the basement of your home)	None/Limited	-	• Stored in household and small storage or basement • Shipping work is mainly manual or consignment	Household

Source: JICA survey team based on FAO (<https://www.fao.org/newsroom/detail/ukraine--rural-communities-need-immediate-support-to-plant-and-produce-food-amid-ongoing-war/en>), UBN (<https://ubn.news/a-modern-potato-storage-facility-with-a-capacity-of-up-to-10000-tons-will-be-built-in-the-chernihiv-region/>).

(2) Tomatoes

Compared to potatoes and cabbage, tomatoes have an extremely short shelf life. Furthermore, proper temperature and humidity management is difficult, and facility management costs are high. Consequently, there are very few instances of facilities owned for the purpose of long-term storage.

(3) Cabbage

Like potatoes, large-scale enterprises own their own storage facilities for cabbage. On the other hand, for SMEs and households, it is considered that the mainstream practice is to use local communal storage facilities or to store them in their home sellers¹⁷.

Table 2.3.15 Trends in Cabbage Storage and Primary Processing Facilities by Enterprise Type

¹⁶ FAO. "Ukraine: rural communities need immediate support to plant and produce food amid ongoing war". 2025-06-02. <https://www.fao.org/newsroom/detail/ukraine--rural-communities-need-immediate-support-to-plant-and-produce-food-amid-ongoing-war/en>, (Accessed 2025-07-01).

¹⁷ Fresh Plaza. "Ukrainian producers seek optimal solutions in vegetable storage to economise". 2024-04-19. <https://www.freshplaza.com/europe/article/9619206/ukrainian-producers-look-for-optimal-solutions-in-vegetable-storage-to-economise/>, (Accessed 2025-07-28).

Company Type	Examples of Companies (from the list of producers)	Overview
Large-scale Enterprises	LLC "VPK-AGRO" LLC Agrofirma "VESNA" LLC "HELIOS - 1" Agricultural LLC "DNIPRO" Farming Enterprise "TAVRIA-SKIF" Farming Enterprise "ECO-VEGETABLES" Farming Enterprise "TRIUMPH"	- Large-scale in-house storage facilities with cooling facilities tend to be available (refrigerators, multiple vegetable storage, pre-refrigeration) - A total of hundreds to thousands of tons? - We have facilities for cleaning and packaging in the company.
SMEs	Private (Farming) Enterprise "MEDOK", Farming Enterprise "WONDERFUL BRAND", Farming Enterprise "Selyanske Druzhba"	Depending on the scale, it is possible to own a storage facility through self-funded investment and use a regional joint storage.
Households	-	- Household, small storage, basement storage, and hand washing - Or sauerkraut and other traditional methods of fermentation and salting preservation

Source: JICA survey team on information from Fresh Plaza (<https://www.freshplaza.com/europe/article/9619206/ukrainian-producers-seek-optimal-solutions-in-vegetable-storage-to-economise/>). Note: Trends in storage and primary processing facilities were summarized for the top 10 cabbage producers by handling area.

2.3.5 Processing

(1) Potatoes

1) Primary Processing

Primary processing companies handle the conversion of fresh products into items such as washed/peeled potatoes and cut potatoes. Some large-scale producers, like Central Plains Group and Agro-Oven, conduct washing, sorting, packing, and primary processing in-house. Additionally, companies such as Reno LLC, which specialize solely in primary processing, have been identified.

Table 2.3.16 Major Potato Processing Companies (Primary Processing)

Company Name	Storage	Washing, sorting, and packing	Oblast	Processing volume	Overview
Central Plains Group (CPG)	○	○	Lviv	N/A	One of the largest storage ~ primary processing facilities in the west. Integrated operation of cleaning, sorting, packaging, and primary processing.
Agro-Oven	○	○	Dnipropetrovsk	N/A	Retail and commercial development of washed, peeled potatoes and cut potatoes
TM "Ovochista" (Impak)	○	○	Dnipropetrovsk	N/A	Retail and commercial development of washed, peeled potatoes and cut potatoes
TM "Matusya Potusia" (Green Guild)	○	○	Kyiv	N/A	Retail and commercial development of washed, peeled potatoes and cut potatoes
TM "Freshko" (under ATK Agrohholdings)	○	○	Kyiv	N/A	Retail and commercial development of washed, peeled potatoes and cut potatoes
Reno LLC	-	-	Kyiv	N/A	Supply of peeled and cut potatoes for commercial and retail use

Source: JICA survey team based on respective company websites (Central Plains Group (<https://centralplains.co.uk/uk/about/>), STOV Desna (<https://www.facebook.com/DesnaSTOV/>), Agro-Oven (<https://www.agrooven.com.ua/en/home>), Continental Farmers Group (<https://cfg.com.ua/en/>), TM Ovochista (<http://www.impak.biz.ua/>), Reno LLC (<https://www.potatopro.com/news/2025/ukraine-fresh-start-reno-llc-marcelissen-potato-processing-technology>) and Aggroberichten Buitenland (<https://www.aggroberichtenbuitenland.nl/actueel/nieuws/2022/12/12/potato-sector-of-ukraine>).

2) Secondary Processing

Secondary processing companies produce a diverse range of processed products, including potato chips, potato flakes, starch, puree, and french fries. In the potato chip sector, US-headquartered Mondelez Ukraine and PepsiCo Ukraine account for most of the domestic market share. For starch, the domestic company Vimal holds a domestic market share of 30–40%.

Table 2.3.17 Major Potato Processing Companies (Secondary Processing)

Company Name	Share	Type of Products					Region	Oblast	Head Office
		Potato Chips	Potato Flakes	Starch	Puree	French Fries			
Mondelez Ukraine (Chips Lux)	Ukrainian market share 20-30%	○					Central-East	Dnipropetrovsk	United States
PepsiCo Ukraine (Lay's)	24% share globally (30-40% in the Ukrainian market)	○					South	Mykolaiv	United States
LLC Snack Product (Club of Chips)	N/A	○					Central-West	Kyiv	Ukraine
S. Group	N/A	○					Central-West	Kyiv	Ukraine
Central Plains Group (CPG)	N/A	○	○	○	○		West	Lviv	Ukraine
Lutsk Foods (TM "San Sanych")	N/A	○					West	Volyn	Ukraine
Lutsk Potato Starch Plant	N/A			○			West	Volyn	Ukraine
Chernihiv Potato Starch Plant	N/A			○			Central-East	Chernihiv	Ukraine
Poltava Potato Starch Plant	N/A			○			Central-East	Poltava	Ukraine
Agro-Oven (АГРО-ОБЕН)	The largest potato puree (around 30%)		○	○	○	○	Central-East	Dnipropetrovsk	Ukraine
Strong Energy West	N/A			○			Central-East	Dnipropetrovsk	Ukraine
Levona	N/A		○	○			South	Kharkiv	Ukraine
Vimal	The largest scale in Japan (over 30-40%)			○			Central-East	Chernihiv	Ukraine

Source: JICA survey team based on D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>) and respective company websites (Mondelez Ukraine (<https://www.mondelezinternational.com/ukraine/>), PepsiCo Ukraine (<https://www.pepsico.ua/>), LLC Snack Product (<https://uifsa.ua/en/about-the-association/partner/lc-snack-production>), S. Group (<https://www.agrooven.com.ua/en/home>), Central Plains Group (<https://uifsa.ua/en/about-the-association/partner/lc-snack-production>), Lutsk Foods (<https://runa.ua/en/about-company/>), Agro-Oven (<https://www.agrooven.com.ua/en/home>), Lenova (<http://levona.com.ua/productEn.php>), Vimal (<https://vimal.ua/en/>)).

(2) Tomatoes

1) Secondary Processing

Secondary processing companies produce canned tomatoes, tomato puree, ketchup, and tomato juice.

Table 2.3.18 Major Tomato Processing Companies (Secondary Processing)

Company Name	Main brands	Overview	Types of Products			Head Office
			Canned	Puree/Ketchup	Tomato Juice	
Agrofusion	• Inagro	• It has factories in Mykolaiv and Kherson regions, and occupies one of the largest production scale shares in the country. Produces tomato paste and powder for commercial and industrial use.	–	○	–	Mykolaiv
Nestlé	• Torchyn	• It had a factory in Volyn and accounted for about 70% of the Ukrainian ketchup market (2016).	–	○	–	Switzerland
Chumak (Сушені)	• Darina	• It has a factory in Kyiv (Kherson before the invasion) and accounted for about 20% of the Ukrainian ketchup market (2021).	○	○	○	Kyiv
Schedro (ЩЕДРО)	• Schedro	• It has factories in Lviv and Zaporizhzhia regions, mainly producing sauces such as ketchup and mustard, and selling them to individuals/companies.	–	○	–	Dnipropetrovsk
Veres (Верес)	• Veres	• It mainly manufactures canned vegetables, pickles, and sauces.	○	○	–	Kyiv
Univer	• Univer	• Started with tomato production, mainly producing tomato products	○	○	○	Hungary
Victor & K (Віктор і К)	• CMAK	• It has a factory in Kirovograd and mainly produces sauces such as ketchup and mustard.	–	○	–	Kirovograd
Lutsk Food (Луцьк Фудс)	• Runa	• It mainly produces sauces such as ketchup and mustard.	–	○	–	Volyn
Pepsico	• Sandora • Sadochok	• It has a factory in Mykolaiv and has a share of about 43% in the natural juice market in Ukraine.	–	–	○	America
Vitmark-Ukraine	• Наш Сік (Nash Sik) • Jaffa	• It has a factory in Odessa and has a share of about 22% in the natural juice market in Ukraine.	–	–	○	Odessa
Biola	• Biola • Соки Ліро (Soki Rito)	• It has factories in Dnipro and Kyiv regions and accounts for about 8% of the Ukrainian natural juice market.	–	–	○	Dnipropetrovsk

Source: JICA survey team based on respective company websites (Agrofusion (<http://www.inagro.ua/>), Nestle (<https://www.nestle.ua/>), Chumak (<https://chumak.com/>), Schedro (<https://en.schedro.ua/>), Veres (<https://www.veresfood.com/en/o-kompanii>), Univer (<https://hungariantomato.com/>), Victor & K (<https://viktorandk.com/>), Lutsk Food (<https://runa.ua/en/about-company/>), PepsiCo (<https://www.pepsico.ua/>), Vitmark-Ukraine (<https://int.vitmark.com/>), Biola (<https://biola.ua/en/about/>)).

(3) Cabbage

1) Secondary Processing

Secondary processing companies for cabbage in Ukraine are primarily engaged in the production of sauerkraut. Large-scale enterprises manufacture sauerkraut for urban consumers and for export. The three companies listed below account for 99% of the pickled cabbage market in Ukraine.

Table 2.3.19 Major Cabbage Processing Companies (Secondary Processing)

Company Name	Processing volume	Type of Products		Overview	Region	Oblast
		Canning	Sauerkraut /Pickles			
FG「CHUDOVA MARKA」	N/A		○	- Produced more than 30 types of pickled kimchi in the Ukrainian market - We have a refrigeration line and freezer, and carry out in-house production ~ processing	Central-West	Kyiv
LLC「NIZHYN CANNERY」	12,000 tons per year (Total Vegetable Processing Volume)	○	○	- Produces more than 40 types of canned products (vegetable snacks, salads) and more than 55 vacuum-packed products (pickles, sauerkraut) - We have an in-house production area of more than 7,000 ha, and we carry out production and processing.	Central-East, South	Chernihiv , Kherson
LLC「DNIPROVSKA FRUIT AND VEGETABLE BASE」	N/A		○	One of the leading sauerkraut and pickle producers on the Ukrainian market. No detailed information	Central-West	Kyiv

Source: JICA survey team based on respective company websites (FG CHUDOVA MARKA (<https://www.chudovamarka.com.ua/>), LLC NIZHYN CANNERY (<https://nezhin.ua/>), LLC DNIPROVSKA FRUIT AND VEGETABLE BASE (<https://www.dneprovska.com.ua/en/about-us>).

2.3.6 Distribution

(1) Overview of Distribution and Sales Channels by Enterprise Type

The sales and distribution models for agricultural products can be classified into three categories: large-scale enterprises, small- and medium-scale enterprises (SMEs), and households, each exhibiting distinct sales routes and scales of distribution.

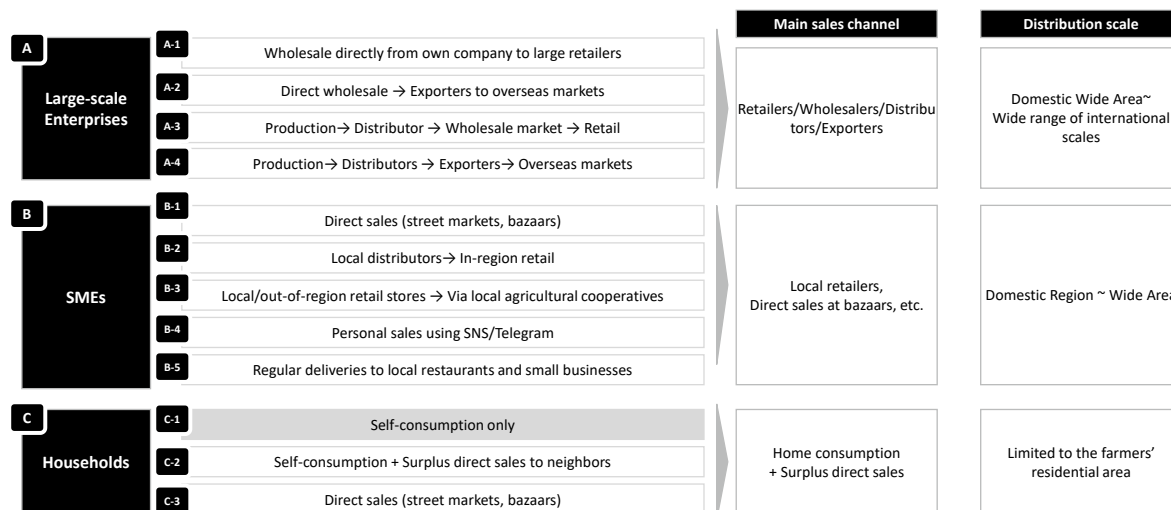
First, large-scale enterprises utilize a variety of sales channels, including (A-1) direct wholesale from the company to large retailers, (A-2) shipments to overseas markets through direct wholesale to exporters, (A-3) supply to wholesale markets via distributors (collectors), and (A-4) distribution to overseas markets through distributors and exporters. Their main customers are retailers, wholesalers, distributors, and exporters, and a key feature is that their distribution scale ranges from nationwide to international markets.

SMEs are observed to use sales models such as (B-1) direct sales at street markets and bazaars, (B-2) supply to local retail stores through local distributors, (B-3) shipments to retail stores via local agricultural cooperatives, (B-4) individual sales using social media platforms like Telegram, and (B-5) regular deliveries to local restaurants and small shops. Their main sales channels are centered on direct sales at local retail stores and bazaars, and their distribution scale tends to be strongly limited to the local and surrounding regions.

For households, (C-1) self-consumption is central, with (C-2) direct sales to neighbors and (C-3) sales at street markets and bazaars serving as the main distribution channels for any surplus. The scale of sales

remains small and is confined to their local area.

Thus, the sales and distribution models for agricultural products differ significantly according to the scale of management, with each playing a role corresponding to its characteristics within the market and local community. The main sales routes and distribution scales for each type are summarized in the figure below.



Source: JICA survey team based on the findings

Figure 2.3.6 Overview of Sales Channels by Enterprise Type in Ukraine

1) Distributors

Distributors involved in vegetable distribution in Ukraine collect products from producers and processors and wholesale them to domestic supermarkets and the HoReCa sector (hotels, restaurants, and cafés). Distributors play a crucial role in enhancing distribution efficiency and ensuring a stable supply, and are a central presence, especially in supplying urban areas and large retail chains.

Table 2.3.20 Major Distributors

Company Name	Domestic Sales (USD)	Items			Wholesale Destination		Head Office	Supply Area
		Potatoes	Tomatoes	Cabbage	Supermarkets, etc.	HoReCa		
Vladam	N/A	○	○	○	○	○	Ukraine	Domestic
Food Agro Com	N/A	○	○	○	○	-	Ukraine	Domestic
Baghel Agro	N/A	○	○	○	○	-	India	Domestic
JIT Trains	N/A	○	○		○	-	Ukraine	Domestic and EU
UVEDI	N/A	○	-	-	○	○	Ukraine	Domestic
LIKO	700K	-	○	-	○	-	Ukraine	Domestic
SMAKOVO UKRAINA	459K	○	○	○	-	○	Ukraine	Central-West
SOFIA TORG COMPANY	N/A	○	○	-	-	○	Ukraine	Domestic
ASCANIA FMCG	N/A	○	○	○	○	○	Ukraine	Domestic

Source: JICA survey team based on respective company websites (Vladam (<http://vladam.com.ua/?lang=en>), Food Agro Com (<https://foodagro.com.ua/index-en.html>), Baghel Agro (<https://www.agroexporters.net/ukraine/cabbage>), JIT Trains (<https://jittrains.org/en/>), UVEDI (<https://www.uvedi.org/products/potato.html>), SMAKOVO UKRAINA (<https://smakovo.com.ua/ovochi/>), SOFIA TORG COMPANY (<https://sofia-tc.com.ua/>), ASCANIA FMCG (<https://ascania-fmcg.com/en/>)).

2) Exporters

Exporters in Ukraine may either directly export products produced and processed by producers and processors themselves, or they may engage in export business by collecting products from producers. In either case, a key feature is that exporters are responsible for accessing international markets and handle a wide range of tasks, including product quality control, logistics, and export procedures.

Table 2.3.21 Major Exporters of Potatoes

Organization Name	Producer/ processor	Region	Oblast	Items					Item Count in Total
				Seed potato	Fresh	Frozen	Potato flakes	Starch	
ADELAIDA Private Farm	○	South	Kherson	○	○				18
Etalon, Trading House, LLC		Central-West	Kyiv		○				115
Agro Oven	○	Central-East	Dnipropetrovsk		○				53
TROPIK Ltd		West	Lviv		○				45
SVAROG WEST GROUP Corporation	○	Central-West	Khmelnyskyi		○				41
AIP AGROGROUP Ltd		Central-West	Kyiv		○				39
Zhytomyr Butter Making Plant, PubJSC	○	Central-West	Zhytomyr			○			24
Sim-Sim, Ternopil Factory of Quick- Frozen Products, LLC	○	West	Ternopil			○			25
NESTLE UKRAINE Ltd	○	Central-West	Kyiv				○		34
LEVONA Private Business	○	Central-East	Chernihiv				○	○	15
MAREVEN FOOD UKRAINE Ltd	○	Central-West	Kyiv				○		9
AGROSNAB Ltd		Central-West	Kyiv					○	41
CEREAL PLANET Business Group	○	East	Kharkiv					○	41
BVA TRADING Ltd		South	Odesa					○	33
VIMAL Private Business	○	Central-East	Chernihiv		○			○	31

Source: JICA survey team based on ITC (<https://www.trademap.org/Index.aspx>). Note: Selected the top five companies for each commodity based on ITC Data.

Table 2.3.22 Major Exporters of Tomatoes

Organization Name	Producer/ processor	Region	Oblast	Items handled					Item Count in Total
				Fresh	Ketchup	Puree	Canned	Juice	
GELIOS-1 Ltd	○	South	Kherson	○					61
Harvest Holding, LLC	○	East	Donetsk	○		○			56
OBIEDNANA SYSTEMA BIZNESIV Ltd	○	Central-East	Dnipropetrovsk	○					49
Pivdenagropromerobka, LLC	○	South	Odesa	○		○			49
KALYNIVKA-PREMIUM Treading House, Ltd		Central-West	Kyiv	○					46
NESTLE UKRAINE Ltd	○	Central-West	Kyiv		○				34
UNIVERSAL Trading Company, Ltd		Central-West	Khmelnitskyi		○				32
VERES Company Group	○	Central-West	Kyiv		○				26
sPANI KRYSTINA Production and Commercial Private Company	○	South	Kherson		○		○		20
CHUMAK PrivJSC	○	South	Kherson		○				16
VIKTOR I K Private Business	○	Central-West	Kirovovhrad			○			33
AF EVRIKA, LLC	○	South	Odesa			○		○	33
Bilhorod-Dnistrovskiy Foodstuff Collective Factory	○	South	Odesa			○		○	29
Bilotserkivskiy Canning Plant, PrJSC	○	Central-West	Kyiv				○		51
STODOLA, LLC	○	South	Mykolaiv				○	○	34
Nizhyn Cannery Plant Ltd	○	Central-East	Chernihiv				○		26
ASPER TRADE LINE Ltd		Central-East	Dnipropetrovsk				○		23
SANDORA Ltd (PepsiCo Group)	○	South	Mykolaiv					○	26
T.B.FRUIT Company Group	○	West	Lviv					○	24

Source: JICA survey team based on ITC (<https://www.trademap.org/Index.aspx>). Note: Selected the top five companies for each commodity based on ITC Data.

2.3.7 Sales

(1) Overview of Retails Stores

Retail stores in Ukraine sell agricultural products and processed goods procured from producers or wholesalers through various formats, including supermarkets, hypermarkets, convenience stores, and E-commerce platforms. The major domestic players are ATB and Fozzy Group¹⁸.

ATB is one of the largest retail companies in the country, operating approximately 1,200 stores, with a business focus on supermarkets and hypermarkets. Fozzy Group, on the other hand, operates about 710 stores and has diversified its business across a wide range of formats, including grocery stores, convenience stores, and premium supermarkets. In addition to their traditional brick-and-mortar businesses, many retailers, including these companies, are also engaging in online sales by expanding into E-commerce, thereby aiming to expand their market size while adapting to changes in customer purchasing behavior.

The following sections summarize the characteristics of each type of sales outlet in Ukraine.

¹⁸ Euromonitor. "Retail in Ukraine April 2025". 2025-04. <https://www.euromonitor.com/retail-in-ukraine/report>, (Accessed 2025-07-25).

Table 2.3.23 Major Retail Stores

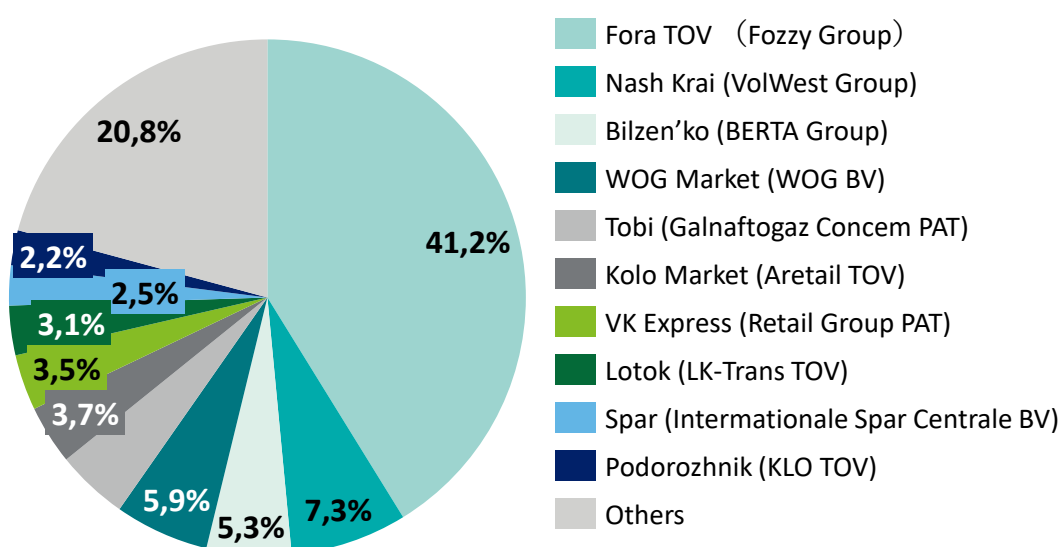
Company Name	Number of stores	Overview	Store Type			Head Office
			Supermarket/Hypermarket	Convenience Store	E-commerce	
АТБ (ATB)	1,187	• The largest retailer in the country, with approximately 1,200 stores.	○		○	Dnipropetrovsk
Fozzy Group	709	• It has about 710 stores in Japan and operates a wide range of businesses, including grocery stores, convenience stores, and high-end supermarkets.	○	○	○	Kyiv
Volwest Retail	252	• It will have about 250 stores in the country and supermarket chains such as SPAR and Nash Clay.	○	○	○	Volyn
МХП (MHP)	231	• The largest agricultural enterprise in Ukraine deploys the Myasomarket chain	○		○	Kyiv
АРИТЕЙЛ (Aritail)	229	• Developing convenience store chain Коло and others		○		Kyiv
Львівхолд (Lvivkholod)	200	• Deploy the Rukavychka supermarket chain	○			Volyn
Клевер Сторс (Klever Stores)	194	• Deploy the Cimi chain of supermarket chains	○			Volyn
ОПТОГР-15 (Optogr-15)	156	—(No information)	○			Kyiv
Вересень Плюс (Veresen Plus)	156	• Faino Market, a convenience store chain, will be deployed in seven regions (Odessa, Dnipropetrovsk, Vinnitsa, etc.)		○		Kirovo Flad
Мережа-Сервіс-Львів (Merezha-Servis-Lviv)	153	• 250 stores in five regions in western Ukraine	○		○	Lviv

Source: JICA survey team based on Euromonitor International "Retail in Ukraine April 2025" (<https://www.euromonitor.com/retail-in-ukraine/report>) and respective company websites (ATB (https://www.atb.ua/en_US/page/atb_market), Fozzy Group (<https://fozzy.ua/en/>), Volwest Retail (<https://volwestgroup.com/en/diyalnist/>), MHP (<https://mhp.com.ua/en/pro-kompaniu>), Lvivkholod (<https://lvivkholod.com/>), Klever Stores (<https://cleverstore.com.ua/ua/>), Merezha-Servis-Lviv (<https://blyzenko.ua/>)).

1) Convenience Stores

Major convenience store companies in Ukraine include Fora TOV (part of Fozzy Group) and Nash Krai (part of VolWest Group). These convenience stores enhance convenience by locating their stores in residential areas and high-traffic zones, leveraging their strength in accessibility for daily use by customers. They have also established systems to continue operations using generators during emergencies such as air raids or power outages.

Furthermore, they are focusing on diversifying their product lineup, offering a wide range of items such as private-label products, low-priced goods, and ready-to-eat meals to meet the diverse needs of consumers.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine April 2025" (<https://www.euromonitor.com/retail-in-ukraine/report>)

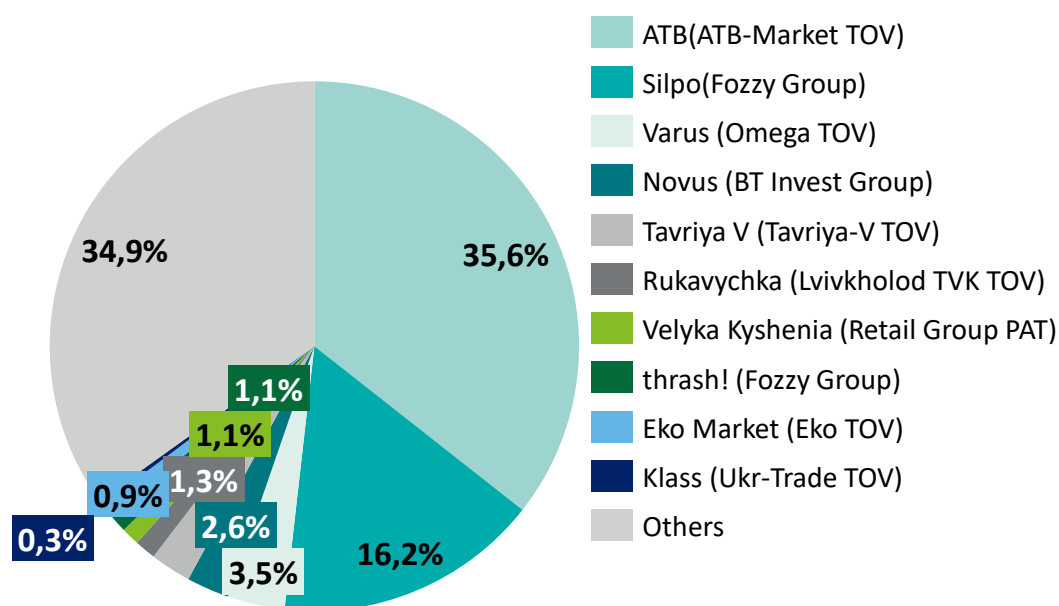
Figure 2.3.7 Convenience Store Major Brand (Company) Sales Volume Share (2024)

2) Supermarkets

Leading supermarket brands (companies) in Ukraine include ATB (ATB-Market TOV) and Silpo (Fozzy Group). These supermarkets offer a wide range of product categories, including groceries, processed foods, and household goods, providing the convenience for customers to purchase everything they need for daily life in a single visit. A key feature is their ability to meet the needs of various consumer segments by offering a balanced mix of both low-priced and value-added products.

Like convenience stores, these companies are also focusing on private-label strategies. By expanding their own brands, they provide high-quality yet low-priced products, succeeding in attracting price-sensitive consumers. This allows them to offer differentiated value and strengthen their competitiveness.

Moreover, the development of omnichannel strategies, offering a purchasing experience across various touchpoints such as online, physical stores, and apps, is also advancing. For example, Novus (BT Invest Group) has introduced an integrated order and pickup system for its stores and online platform, allowing customers to order products online and pick them up smoothly at the store. This provides further convenience to consumers and allows for flexible responses to changing needs.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine April 2025" (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.3.8 Supermarket Major Brand (Company) Sales Volume Share (2024)

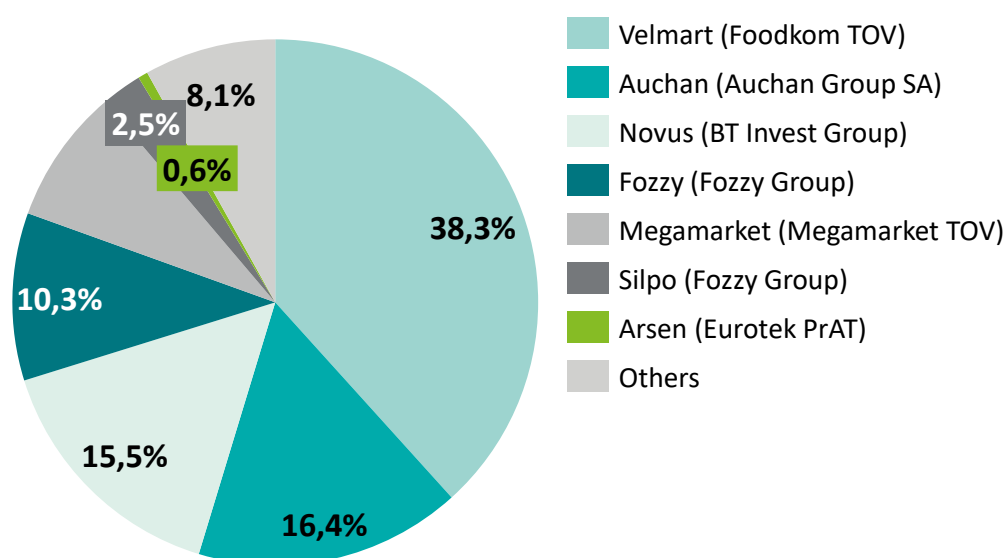
3) Hypermarkets

Leading hypermarket brands (companies) in Ukraine include Velmart (Foodkom TOV), Auchan (Auchan Group), and Novus (BT Invest Group). Hypermarkets offer a wide range of products, including food, non-food items, and daily necessities, as well as large household items rarely handled by

supermarkets. This extensive product offering allows them to cater to families and bulk-buying demand.

Companies like Velmart adopt a warehouse-style sales model to provide low-priced, competitive services. They reduce procurement costs through bulk purchasing and cut operational costs by minimizing store decorations and services. They also control logistics costs by simplifying the distribution process. Furthermore, by storing and displaying products in bulk, they improve inventory management efficiency, which helps to mitigate risks such as stockouts of popular items or excess inventory.

In addition, similar to supermarkets, hypermarkets are also advancing their omnichannel strategies, providing a purchasing experience that meets the diverse needs of consumers. Through these efforts, hypermarkets aim to enhance customer satisfaction while maintaining their competitiveness.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine April 2025" (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.3.9 Hypermarket Major Brand (Company) Sales Volume Share (2024)

4) Specialized Grocery Chains

Specialized grocery chains provide unique value to consumers through strategies centered on category specialization and differentiation. For instance, Myasomarket specializes in meat, Moloko Vid Fernera in dairy products, and Kramline in seafood. By pursuing quality and expertise in their respective fields, they target niche markets. This allows them to differentiate themselves from general supermarkets and appeal deeply to consumer segments with specific demands.

Furthermore, these chains emphasize a high-quality orientation and have strengthened their collaboration with local farmers and small-scale producers. This approach enables them to offer fresh, safe products, which has earned them strong support, particularly from health-conscious and sustainability-oriented consumers.

5) Local Grocery Stores

Small, local grocery stores play a crucial role in meeting the daily needs of nearby residents through community-based operations. These stores cater to households by allowing for frequent purchases of groceries and daily necessities in small quantities, providing services closely tied to daily life. Their accessible locations and convenience are also attractive to the elderly and residents with limited transportation options, making them an indispensable part of the local community.

The pursuit of locality is another major feature of these stores. By actively carrying local agricultural products, handmade foods, and simple daily goods, they have successfully differentiated themselves by leveraging regional characteristics. Through these efforts, small local grocery stores are achieving sustainable management while building relationships of trust with local residents.

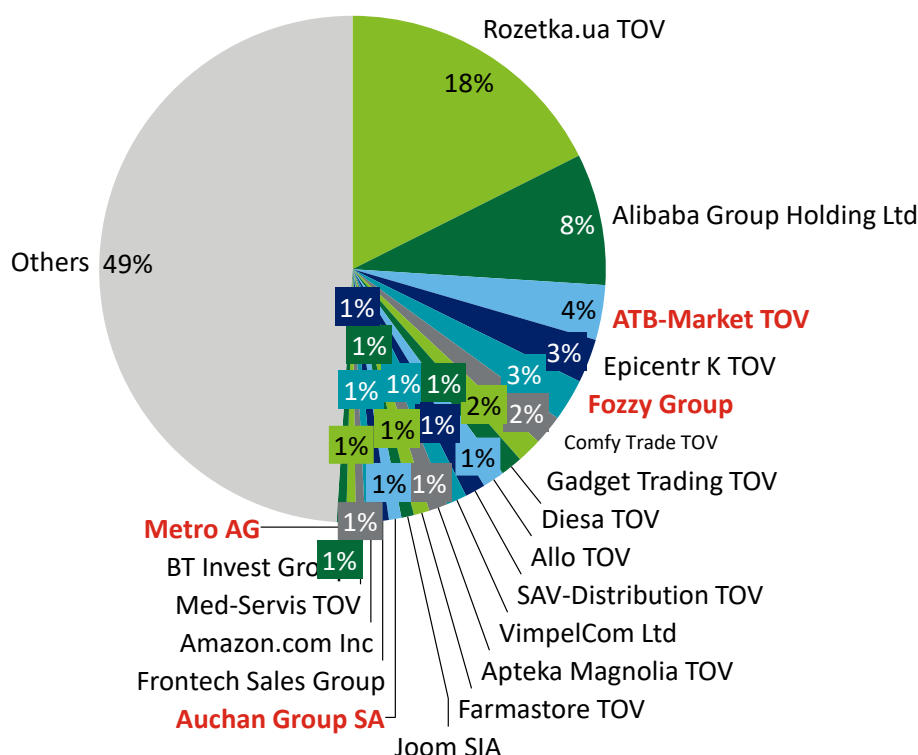
6) E-Commerce

Major E-commerce players in Ukraine include companies that operate domestic supermarket businesses as well as entries from global E-commerce corporations. In the grocery sector, ATB-Market TOV, Fozzy Group, Auchan Group, and Metro AG are notable key players. These companies leverage their existing physical store networks to enhance online ordering and delivery services, thereby improving consumer convenience.

Companies like Rozetka and Zakaz.ua are leading the growth of the E-commerce market by creating an environment where consumers can easily place orders anytime, anywhere, with a focus on food delivery services. Such services offer significant convenience to busy modern individuals and consumers with mobility restrictions.

Furthermore, attention is also being drawn to the expansion of cross-border trade. By promoting the export of local products, entry into international markets is being pursued, contributing to the enhanced competitiveness of local companies. For example, Nova Post is expanding its logistics network to build a system that delivers products quickly and efficiently worldwide, thereby supporting the global expansion of local brands.

In addition, the development of social commerce using social media represents a new growth opportunity for businesses. By connecting directly with consumers through platforms like Facebook and Instagram, companies are provided with a venue for product introductions and sales. The resulting improvement in customer engagement, brand awareness, and acquisition of new customers is another important trend in Ukraine's E-commerce market.



Source: JICA survey team based on Euromonitor International, "Retail in Ukraine April 2025" (<https://www.euromonitor.com/retail-in-ukraine/report>)

Figure 2.3.10 E-Commerce Major Brand (Company) Sales Volume Share (2024)

2.3.8 Associations and Cooperatives

(1) Associations

1) Seed Association of Ukraine (Potatoes, Tomatoes, Cabbage)

The Seed Association of Ukraine was established in 2011 and is based in the Kyiv region. The association is composed of seed-related companies with operations both within Ukraine and abroad, including in Europe. Its main objectives are to "protect the interests of association members" and "promote the international dissemination of the Ukrainian seed industry."

Its activities include providing and disseminating information on new technologies and varieties, promoting their adoption, and developing legislation in collaboration with the government and international organizations. It also hosts agricultural forums where diverse stakeholders participate, including representatives of seed companies, agricultural producers and managers, government officials and regulators, research institutions and universities, international organizations and foreign embassies, related industry companies and organizations, and industry media and journalists. Through these meetings, discussions on the development of the seed market and agriculture are held¹⁹.

¹⁹ Ukrainian Seeds Association. "Mission and Goals of Ukrainian Seeds Association". <https://ukrseeds.org.ua/en/mission-and-goals-ukrainian-seeds-association>. (Accessed 2025-07-01).

2) Ukrainian Horticultural Association (Potatoes, Tomatoes, Cabbage)

The Ukrainian Horticultural Association (UHA) is based in the Kyiv region and is primarily composed of export-oriented fruit and vegetable producers. The association was established with the aim of enhancing the competitiveness of Ukraine's horticultural industry in the global market and is actively involved in promoting interaction among fruit and vegetable producers, developing new markets, and improving food quality.

Specific activities include building networks and sharing information among producers, supporting the adoption of the latest technologies and marketing methods, and promoting compliance with international standards and certification acquisition. The association also collaborates with the FAO (Food and Agriculture Organization of the United Nations) and EU4Business (an EU program for SME support) to receive technical assistance and funding, aiming for the overall development of the horticultural industry^{20,21}.

3) Ukrainian Association of Potato Growers (Potatoes)

The Ukrainian Association of Potato Growers was established in 2010 in the Kyiv region, with its headquarters located at the Potato Research Institute of the National Academy of Agrarian Sciences of Ukraine (NAAS). The association operates with the primary goal of promoting the production of high-quality, safe potatoes, in collaboration with both domestic and international multinational corporations. It also undertakes various initiatives to enhance producer competitiveness, such as organizing seminars, conducting market research, and engaging in joint research and development with seed companies.

One of the association's main activities is hosting the annual "Potato Day" event. Held at the premises of Continental Farmers Group in the Lviv region, this event brings together diverse stakeholders from home and abroad to promote the development of the potato industry and share research findings. The theme for 2025 focuses on improving the sustainability of the potato industry, introducing the latest technologies, and strengthening competitiveness in the international market. Participants included NAAS, major domestic seed producer PrJSC Chernihivelitekartoplya, and European seed-related companies such as Agrico Ukraine, HZPC Ukraine, SANDORA Ltd, Norika Ukraine, Europlant, and Solana Ukraina/Logistica.

Event activities include performance trials of domestic and foreign potato varieties, crop growth experiments under various agrochemical environments (herbicides, fertilizers), and validation of suitability for organic cultivation. In terms of production technology, activities include optimizing cultivation methods for different climatic conditions, cultivation under drought conditions, and proposing sustainable production systems. Regarding storage technology, efforts are being made in experiments on the effectiveness of long-term storage in refrigerated and low-oxygen environments, as

²⁰ UHA. "About Us". <https://fruit-ukraine.org/eng/about-us/>, (Accessed 2025-07-01).

²¹ EastFruit. "UHA: Ukrainian vegetable growers will receive state support for the first time in 29 years". 2020-10-26. <https://east-fruit.com/en/news/uha-ukrainian-vegetable-growers-will-receive-state-support-for-the-first-time-in-29-years/>, (Accessed 2025-07-01).

well as improvements in packing technology for international transport. Furthermore, the formation of new partnerships is actively promoted through networking sessions among participating companies²².

(2) Agricultural Cooperatives

1) Characteristics of Agricultural Production Cooperatives and Agricultural Service Cooperatives under the Old Law

Agricultural cooperatives in Ukraine are broadly divided into two types: agricultural production cooperatives and agricultural service cooperatives. Under the old Ukrainian law, these cooperatives were clearly distinguished.

First, agricultural production cooperatives are for-profit legal entities aimed at generating profit through the production, processing, and sale of agricultural products. A key feature is that membership is limited to individuals who are obligated to participate in labor. Their activities include crop cultivation, livestock breeding, and the processing and sale of agricultural products^{22, 23}.

On the other hand, agricultural service cooperatives are non-profit legal entities aimed at supporting their members. They operate to help members reduce costs and increase profits by providing technology, infrastructure, and services. Membership includes both individuals and legal entities, and there is generally no obligation for labor participation. Their scope of activities is centered on providing support services in the production, processing, and sale related to crops, livestock, forestry, and fishery^{22, 23}.

Category		Agricultural production cooperatives (Farmers' cooperative organizations)	Agricultural Service Cooperative (Farmer Support Service Provision)
Differences	Purpose	[Profit acquisition] ➤ Through economic activities such as the production, processing, and sale of agricultural products, earn profits.	[Member support] ➤ By providing technology, infrastructure, services, etc. to members, we will provide support such as reducing costs and increasing revenue for members.
	The Legal Nature	[Commercial corporation] ➤ It is classified as a corporate entity and is permitted to engage in profit-making activities under the Civil Code and the Commercial Code.	[Non-profit corporation] ➤ Prioritizing the interests of members and having a non-commercial nature as provided for by law
	Membership Characteristics	[Individuals only] ➤ Membership is limited to individuals only, and members are obliged to participate in labor.	[Individuals and corporations] ➤ Individuals and corporations gather to establish labor participation obligations. There is basically no imposition.
Common feature	Scope of Activities	[Wide area] ➤ Carry out a wide range of activities such as crop cultivation (joint cultivation of soil), livestock breeding, processing and sales of agricultural products	[Wide area] ➤ Carry out activities to provide support services for production, processing and sales related to crop production, animal husbandry, forestry and fisheries
	Management System	[Management of General Meetings] ➤ The General Assembly of Members is the highest decision-making body to make decisions in pursuit of profits.	[Management of General Meetings] ➤ The General Assembly of Members shall be the highest decision-making body, and shall make decisions that prioritize the interests of members while maintaining a non-profit nature.

Source: JICA survey team based on based on LIGA360 (<https://ips.ligazakon.net/document/GH51B00A?an=52>) and Ukrainian Agri Council (<https://uacouncil.org/uk/post/kooperacia>)

Figure 2.3.11 Characteristics of Agricultural Production and Service Cooperatives

While the old Ukrainian law clearly distinguished between agricultural production and service cooperatives, this led to several challenges, including limitations in the legal system, cooperative development, membership acquisition, and constraints on sales and trade. In response to this situation,

²² UAVK. "UAVK HP". <https://potatoclub.com.ua/>, (Accessed 2025-07-01).

a new "Law on Agricultural Cooperation" (No. 819-IX “Про сільськогосподарську кооперацію”) was adopted on July 21, 2020. This law aims to unify related regulations and strengthen collaboration among cooperatives, thereby establishing a new institutional framework.

With the implementation of the new law, state-sponsored human resource development and financial support have been enhanced, leading to greater stability in cooperative financing²³. Also, by expanding new membership eligibility to legal entities and easing restrictions on activities, the flexibility of cooperatives has improved. Furthermore, the option to choose between for-profit and non-profit status has greatly expanded opportunities and convenience for cooperatives to access new markets²⁴.

It should be noted that the FAO and the EBRD (European Bank for Reconstruction and Development) advocated for the promotion of agricultural cooperatives and the harmonization of the legal system in Ukraine for over seven years leading up to the drafting of this law. The implementation of the new law has unified previously cumbersome related regulations, abolished the strict classification of production and service cooperatives, and significantly changed financing and membership systems.

Legacy challenges	Challenge Overview	New Act
Legal system Inadequate	- In agricultural production cooperatives and agricultural service cooperatives, the relevant laws and regulations of multiple cooperatives are not consistent with each other. - In agricultural production cooperatives/agricultural service cooperatives, activities are strictly classified, and there is no coordination between unions.	[Unification of relevant laws and regulations] - By regulating the operation of cooperatives with one "Agricultural Cooperative Law" rather than multiple laws, it will contribute to eliminating legal complexity and improving operational efficiency. [Promotion of cooperative collaboration] - Cooperative federations can be established and cooperation between cooperatives is strengthened.
Cooperative development	Agricultural production cooperatives/agricultural service cooperatives lack operating funds and educational activity expenses, as well as insufficient state support.	[Support as a state] - Supporting human resource development, financial support from national and local budgets, and access to agricultural insurance [Changes to the Funding System] - By obliging cooperatives to allocate at least 5% of their net profits to the development fund, it will contribute to the purchase of capital equipment and the promotion of educational activities.
By membership restriction	- In agricultural production cooperatives, membership is limited to individuals and corporations cannot participate, which restricts the expansion of cooperatives and the enhancement of financial strength. - In agricultural production cooperatives, labor participation of members is mandatory, and it is expected that the burden on farmers will increase or that inflexibility will increase.	[Flexible cooperative framework] - Not only individuals but also corporations can have cooperative membership, contributing to the expansion of the size of the union. - We will contribute to improving the degree of freedom of economic activity by abolishing the strict classification of agricultural cooperatives into production and service types and allowing them to freely choose their forms of activity.
Sales and Trading constraint	Due to the nature of agricultural service cooperatives, transactions with external non-members are prohibited, which may lead to loss of revenue opportunities.	[Enabling for-profit/non-profit selection] Transactions with non-members will be allowed to be carried out within the scope of not exceeding 20% of total revenue, which will contribute to increased profitability through access to new markets.

Source: JICA survey team based on based on LIGA360 (<https://ips.ligazakon.net/document/GH51B00A?an=52>) and Ukrainian Agri Council (<https://uacouncil.org/uk/post/kooperacia>)

Figure 2.3.12 Features of the New Law Based on the Challenges of the Old Law

2) List of Agricultural Cooperatives by Commodity

The table below shows the agricultural cooperatives in Ukraine that were identified through the desktop survey²⁵.

²³ LIGA360. “Пояснювальна записка до проекту Закону України від 31.05.2017 № 6527”. 2017-05-31. <https://ips.ligazakon.net/document/GH51B00A?an=52>, (Accessed 2025-07-01).

²⁴ Ukrainian Agri Council. “Кооперація”. 2020-11-23. <https://uacouncil.org/uk/post/kooperacia>, (Accessed 2025-07-01).

²⁵ Tripoli. “Фермерські господарства України”. <https://tripoli.land/ua/farmers>, (Accessed 2025-07-01).

Table 2.3.24 List of Cooperatives by Commodity

Organization Name	Region	Oblast	Items handled and cultivated area (ha)		
			potato	tomato	cabbage
Volyn Potatoes	West	Volyn	N/A	-	-
Agroslav✳	West	Lviv	2	-	2
Nadiya-YEO	West	Chernivtsi	1.3	-	-
Dolina Plus	Central-West	Kyiv	1	0.2	0.2
Letava	Central-West	Khmelnyskyi	3	-	-
Polyana	Central-West	Khmelnyskyi	0.06	-	-
Prydnipriansky	Central-East	Poltava	0.1	0.03	0.03
Iskra	Central-East	Poltava	5	0.85	0.47
Fatherland	Central-East	Poltava	3	0.3	0.5
Friendship	Central-East	Poltava	0.7	-	-
Agroprogress	South	Odesa	4	2.2	2
Oberig Agro	South	Mykolaiv	-	N/A	-
Avangard	South	Mykolaiv	2	-	-
Russia	South	Zaporizhia	0.5	-	0.5

Source: JICA survey team based on Toripoli (<https://tripoli.land/ua/farmers>). Note: To understand the challenges of SMEs and households, a preliminary list of agricultural cooperatives was created, primarily based on registration information, with the intention of conducting interviews. However, as the commodity classifications were broad (e.g., "vegetables" and "root vegetables"), making it impossible to view information on specific commodities, Tripoli was used to narrow down the list of cooperatives for each commodity.)

2.4 Challenges and Opportunities

2.4.1 Challenges and Strategies in Production

The primary challenge facing the production base of Ukraine's agricultural sector is the erosion of economic value and decreased profitability in agricultural production. These issues are driven by various factors, with the impacts of climate change and extreme weather events being a fundamental underlying cause. Specifically, unpredictable weather fluctuations—such as abnormally high temperatures and insufficient precipitation in 2023²⁶, late frosts combined with excessive rainfall and high temperatures in 2024, and a cold spell in April 2025—have severely impacted crop development²⁷. In addition to these climatic factors, other challenges are evident, including a limited selection of crop varieties, inadequate cultivation techniques, and quality degradation during storage. It is anticipated that continued climatic instability and the progression of global warming will further exacerbate these adverse impacts on both crop yields and quality.

To address these challenges, technical cooperation project is considered an effective approach, to be pursued in partnership with governmental research institutes, agricultural associations, and vocational training schools. The objective of such cooperation should be to enhance climate change adaptation within the cultivation environment. For technologies that require future on-site verification in Ukraine, it is crucial to explore a wide range of options, with a focus on materials and inputs that can be rapidly adopted even by small-scale enterprises. At the same time, these technologies require thorough verification of their crop-specific efficacy, compatibility with local soil conditions, and long-term sustainability. Therefore, a phased introduction through demonstration projects designed to meet local

²⁶ AGRICO. "AGRICO Demo Centers" . <https://www.agrico.com.ua/en/agrico-demo-centers>, (Accessed 2025-07-25).

²⁷ TCD. "Farmers devastated as sudden weather event wreaks havoc on key crops: 'Almost 100% damaged'" . 2025-05-

26. <https://www.thecooldown.com/sustainable-food/ukraine-cold-snap-fruit-crop-loss/>, (Accessed 2025-07-25).

needs is considered essential for successful implementation.

The formulation of response strategies for the challenges detailed in this chapter is based on the following two premises.

First, direct support for large-scale infrastructure development including irrigation, storage, and processing facilities—is currently considered impractical. This is due to a combination of factors: damage caused by the ongoing invasion, prevailing security constraints, and shortages of both budget and human resources. These challenges are further compounded by difficulties in implementing on-site construction work due to travel restrictions. Therefore, a more realistic approach is to focus on technical cooperation project and to maximize the utilization of existing infrastructure and available subsidy programs.

Second, the agricultural cooperative model, while often recognized as a useful tool for strengthening the vegetable value chain for SMEs, faces significant institutional, cultural, and operational barriers within the Ukrainian context. Consequently, promoting a contract farming model that leverages the existing structures of private enterprises is considered a more effective strategy. This approach serves as a viable means to ensure stable procurement for buyers while securing reliable sales channels for producers.

To enhance the productivity, yield, and quality of SMEs, it is essential to create an integrated value chain that connects upstream activities (production and storage) with downstream activities (distribution and sales). In many countries, such as Japan and those in Europe, agricultural cooperatives have historically played a crucial role in bridging these segments. However, while the cooperative model is recognized for its potential to consolidate produce and expand sales volumes, its implementation in Ukraine faces considerable barriers, as confirmed through stakeholder consultations.

Institutionally, cooperatives are often classified as for-profit organizations under the current regulatory framework. This classification has been noted to result in a form of double taxation, where taxes are levied both when farmers sell to the cooperative and again when the cooperative sells to the final customer, such as a retailer. Furthermore, cooperatives in rural areas are subject to significant administrative burdens, including stringent tax requirements and extensive documentation obligations. Beyond these institutional issues, other factors impede the smooth operation of cooperatives. These include cultural factors, such as negative historical associations with the "Kolkhoz" (collective farms) and "Sovkhoz" (state farms) of the Soviet era, as well as organizational factors like a shortage of qualified management personnel and a lack of trust among members²⁸.

Therefore, given these multifaceted challenges, the introduction of a "contract farming" model is considered a more viable strategy for linking the upstream and downstream segments of the vegetable value chain for SMEs (as will be detailed in 2.4.4).

²⁸ Baltic Journal of Economic Studies. Roman Bezus, Ihor Bilotkach. "DEVELOPMENT OF ORGANIC FARMERS' COOPERATIVES: THE USA, THE EU, AND UKRAINE". 2018. <http://www.baltijapublishing.lv/index.php/issue/article/view/376/pdf>, (Accessed 2025-12-22).

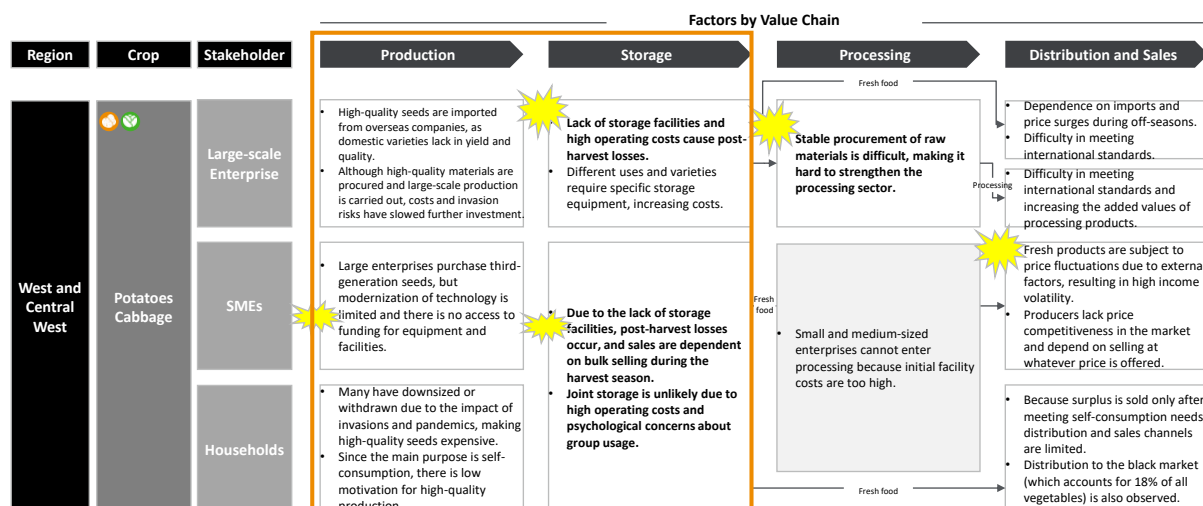


Figure 2.4.1 Factors of Production Challenges by Region, Crop, and Type of Enterprise (Potatoes and Cabbage)

(1) High Costs Associated with Selecting Appropriate Varieties (Potatoes and Cabbage)

In Ukraine's potato and cabbage production, the challenges related to sourcing seeds and seed potatoes exhibit a structural difference depending on the scale of the producers.

For potatoes, large-scale enterprises directly purchase high-quality seed potatoes from foreign seed companies and engage in on-farm multiplication. However, the sector's high dependence on imports, with foreign varieties accounting for 95% of the potato market and half of the varieties listed in the State Register of Plant Varieties²⁹, poses risks such as increased operational costs from rising import prices and supply instability contingent on international affairs. Conversely, SMEs find it difficult to directly access high-quality foreign seed potatoes due to cost constraints. Consultations with agricultural associations confirmed the existence of a dependent structure where these SMEs purchase third-generation seeds multiplied by large-scale enterprises, placing them at a disadvantage in terms of quality assurance and stable procurement. Furthermore, at the household level, renewal of seed potatoes is infrequent, and self-propagation is the predominant practice, which directly leads to a decline in quality and yield over successive generations, as well as an increased risk of disease.

For cabbage, late-maturing varieties, which allow for efficient mass production, account for 70-80% of total output³⁰. However, most high-yielding and disease-resistant F1 hybrids are of foreign origin and come at a high cost, making their adoption difficult, particularly for SMEs and households. As a result, there is a continued reliance on early maturing and traditional varieties that offer lower yields and poorer storability, hindering improvements in quality and profitability.

²⁹ PotatoPro. "Introducing the Potato Varieties newly registered in the Ukraine in 2024". 2024-10-23.

²³ <https://www.potatopro.com/news/2024/introducing-potato-varieties-newly-registered-ukraine-2024>, (Accessed 2025-06-01).

³⁰ Agravery.com. "Попит на капусту залишається низьким: середньопізні сорти заповнили ринок". 2024-10-29.

<https://www.agravery.com/uk/posts/show/popit-na-kapustu-zalisaetsya-nizkim-serednopizni-sorti-zapovnili-rinok>, (Accessed 2025-08-01).

Based on these findings, proposed response strategies include technical education and training on optimal variety selection, complemented by subsidies and cultivation support, with the aim of strengthening the domestic supply system over the medium to long term. Regarding technical education, it is recommended to implement training programs in collaboration with governmental research institutes, associations, and vocational schools. These programs should enable producers to understand varietal characteristics and master appropriate cultivation methods, and it is necessary to promote a comprehensive approach that includes disease management and soil improvement techniques. A key consideration is to establish a support system that extends beyond the mere distribution of seeds to encompass follow-up guidance on operations to ensure subsequent improvements in quality and yield.

For instance, organizations such as the FAO have provided support by distributing a total of 862 tons of seed potatoes to 17,740 households (approximately 46,000 people) across ten oblasts of Ukraine, including Lviv and Dnipropetrovsk. While each household received 50 kg of seed potatoes with a theoretical expected yield of around 600 kg per family, such one-off distributions have limitations in achieving sustainable improvements³¹. If knowledge dissemination is insufficient, the effective utilization of inputs can be challenging. Therefore, implementing technical education and material assistance in tandem is considered a more effective approach for generating greater impact.

(2) Underdeveloped Production Technologies (Potatoes and Cabbage)

To secure stable yields and quality in potato and cabbage production, the introduction of production technologies suited to the specific characteristics of each crop is essential. In Ukraine, however, disparities in technology adoption and underdeveloped infrastructure contribute to reduced production efficiency for both SMEs and large-scale enterprises.

The yield and quality of potatoes and cabbage are heavily dependent on the level of production technologies applied, including soil management, irrigation, and pest and disease control. According to a study by the National Academy of Agrarian Sciences of Ukraine (NAAS), the level of technology adoption is a decisive factor for cabbage yields and profitability. The study indicates that yields can be increased from 25 tons per ha with basic, labor-intensive techniques, to 45 tons with conventional techniques using domestically produced machinery, and up to 65 tons with intensive techniques utilizing advanced equipment³². However, for both potatoes and cabbage, SMEs and households struggle to adopt necessary equipment and advanced technologies due to financial constraints, limited access to technical information, and delays in technology dissemination. This is particularly true for households, where the burden of production costs has diminished their motivation to produce high-quality agricultural products. Meanwhile, while large-scale enterprises possess advanced technologies, further investment essential

³¹ FAO. "Food security in Ukraine: FAO distributes seed potatoes to vulnerable rural families. Some 46 000 people are assisted during the spring potato sowing campaign". 2022-05-18. <https://www.fao.org/newsroom/detail/food-security-in-ukraine-fao-distributes-seed-potatoes-to-vulnerable-rural-families/en>. (Accessed 2025-06-01).

³² Vegetable and Melon Growing. "STATE AND PROSPECTS OF WHITE HEAD CABBAGE PRODUCTION IN UKRAINE. EVALUATION OF TECHNOLOGIES". 2024-07-08. <https://vegetables-journal.com/index.php/journal/article/view/411>, (Accessed 2025-07-25).

for productivity enhancement has stagnated due to the deterioration of the investment environment caused by the invasion.

As a short-term response strategy, it is crucial to provide training for SMEs and households through technical cooperation project to facilitate the early stabilization of their production activities. Specifically, deploying practical training and extension activities on fundamental cultivation techniques is expected to improve production efficiency and quality even with limited resources. These activities would cover topics such as disease management, irrigation control, and appropriate harvesting and storage methods. In the medium to long term, it is necessary to establish a sustainable production base by modernizing irrigation infrastructure, disseminating advanced soil management techniques, and promoting the adoption of smart farming technologies, all while considering the impacts of climate change. These initiatives are expected to strengthen the production activities of SMEs and contribute to the sustainable and stable development of the agricultural sector.

(3) Shortage of Storage Facilities (Potatoes and Cabbage)

Post-harvest storage capacity is indispensable for maximizing the productivity of potatoes and cabbage. However, a shortage and underdevelopment of storage facilities in Ukraine have caused many producers to face quality degradation and reduced profitability. As of early 2025, the situation has been further exacerbated by the invasion, which has reportedly destroyed approximately 250,000 tons of vegetable storage capacity, resulting in an overall deficit of about 340,000 tons. This escalation of a pre-existing challenge poses a significant concern for the nation's food security^{33, 34}.

The Government of Ukraine is advancing plans to develop new storage facilities through public–private partnerships. According to interviews with government officials, a new subsidy program to promote the construction of vegetable storage facilities is scheduled for the 2026–2028 period, with applications opening on April 1, 2026³⁵. This program will offer grants to private legal entities for constructing facilities based on their own needs. The grant will cover up to 30% of construction costs, with a ceiling of UAH 20 million (approximately €460,000), or up to 50% in conflict-affected regions. The plan anticipates the construction of 69 new facilities (nineteen 10,000-ton and fifty 3,000-ton facilities), adding a total capacity of 340,000 tons. The government's annual budget for this initiative is UAH 460 million (approximately €10.58 million), and it is actively seeking collaboration with international organizations to advance this project.

The program is limited to legal entities registered in the State Agrarian Register (DAR), with households excluded. Ownership of the facilities will belong to the grant recipients, who will have

³³ Fresh Plaza. “Lower yield of potatoes in Ukraine, imports increasing” . 2024-12-12. <https://www.freshplaza.com/north-america/article/9687505/lower-yield-of-potatoes-in-ukraine-imports-increasing/>. (Accessed 2025-07-01).

³⁴ Fresh Plaza. “Storage shortage and rising costs: Ukrainian vegetable prices under pressure” . 2025-03-10. <https://www.freshplaza.com/europe/article/9712300/storage-shortage-and-rising-costs-ukrainian-vegetable-prices-under-pressure/>. (Accessed 2025-07-25).

³⁵ РАДА Верховна Рада України. “П р о внесення змін до постанов Кабінету Міністрів України від 21 червня 2022 р. № 738 і від 4 лютого 2023 р. № 98”. 2026-01-21. <https://zakon.rada.gov.ua/laws/show/62-2026-%D0%BF#Text>. (Accessed 2026-02-05).

flexibility in their use (e.g., for own use, shared use, or leasing), but they will be subject to periodic audits and reporting obligations by banks for five years post-construction. Quality control will be the responsibility of the operators and distributors, with compliance to national standards (DSTU) being voluntary. The financing structure requires a 70% contribution from the private sector (operator's own funds) and a 30% government grant.

On the other hand, the construction of storage facilities requires substantial initial investment, making it difficult for households, which are not eligible for the program. High operational costs and the instability of the energy supply needed for cooling and humidity control further compound the challenge. Since the invasion, rolling blackouts lasting 6 to 9 hours a day have become commonplace in Ukraine³⁶, making the stable operation of storage facilities difficult. Furthermore, these facilities require precise temperature and humidity control specific to each crop (e.g., potatoes require 4-8° C and 90-95% humidity; cabbage requires 0-1° C and 90-98% humidity), yet there is a lack of advanced environmental control technology and operational know-how³⁷. Additionally, the storage and management methods for potatoes vary depending on their intended use (seed, fresh consumption, or processing) and variety, necessitating facilities that can accommodate these diverse requirements.

Moreover, consultations with a potato production expert revealed a case where a company established a shared storage facility for SMEs but experienced poor profitability due to costs associated with quality inspection at delivery, storage management, and logistics³⁸. This case suggests the need to consider sustainable models for shared use in addition to simply constructing facilities.

Considering these factors, an effective response strategy should advance both the "quantitative expansion" of storage facilities, as promoted by the Ukrainian government, and the "qualitative improvement" and "sustainability" needed to maximize their impact. First, it is necessary to provide financial cooperation for the government's expansion plan to directly address the urgent shortage of storage facilities. Second, it is important to establish a scheme that encourages large-scale enterprises with existing storage facilities to promote shared use with SMEs. Specifically, this involves expanding the contract farming model for processed and fresh products (as detailed in 2.4.4) to create a system where SMEs can utilize the storage infrastructure of larger enterprises. In addition to such "hard" infrastructure support, it is also crucial to mitigate losses for SMEs and households, for whom the benefits of new facilities may be limited. This can be achieved through education and the dissemination of basic preservation techniques.

³⁶ RBC-UKRAINE. "Two years of rolling blackouts: How Ukraine preparing its energy sector for winter and future challenges". 2024-06-13. <https://newsukraine.rbc.ua/analytics/two-years-of-saving-electricity-how-ukraine-1718265978.html>, (Accessed 2025-07-25).

³⁷ Агробізнес-Україна. "Зберігання капусти". 2017-02-08. <https://agro-business.com.ua/agro/zberihannia/item/8244-zberihannia-kapusty.html>, (Accessed 2025-07-25).

³⁸ Inventure. "Green Team invests USD 40mln into vegetable storage in Ukraine". 2016-11-28. <https://inventure.com.ua/en/news/ukraine/green-team-invests-usd-40mln-into-vegetable-storage-in-ukraine>, (Accessed 2025-12-24).

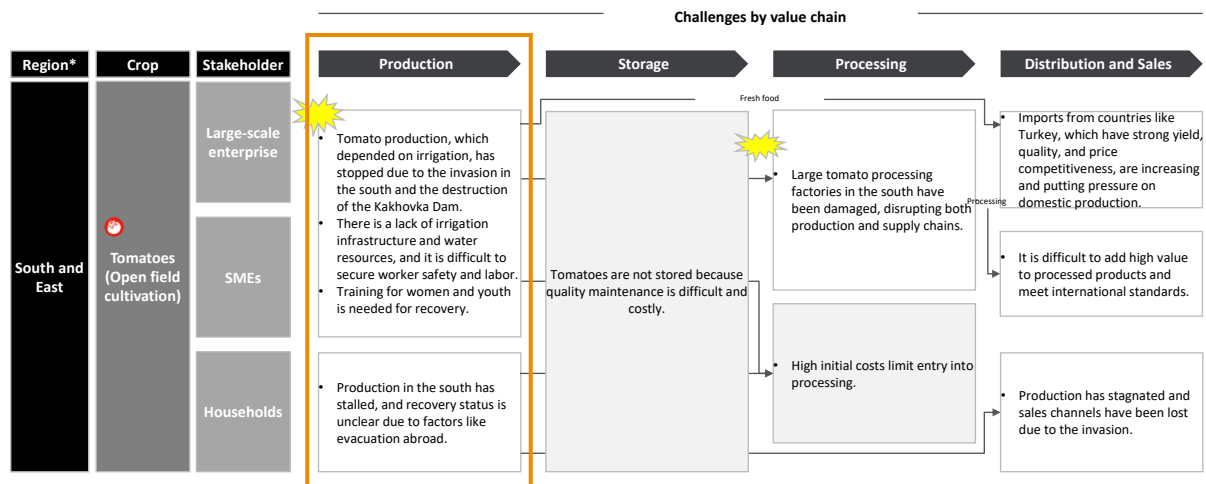


Figure 2.4.2 Factors of Production Challenges by Region, Crop, and Type of Enterprise (Open-field Tomatoes)

(4) Damage to Production Hubs and Increased Costs for Soil Improvement and Fertilization at Relocation Sites (Open-Field Tomatoes)

In open-field tomato cultivation, the destruction of the Kakhovka Dam in 2023³⁹ caused devastating damage to irrigation infrastructure in the southern region, compelling many production hubs to cease operations. Households have been unable to continue production due to factors such as the displacement of residents resulting from the invasion's impact on the south⁴⁰. For large-scale enterprises, while restoring infrastructure and soil requires substantial investment and specialized personnel, securing adequate public funds or external investment has become difficult due to Ukraine's financial constraints and heightened security risks. Furthermore, direct implementation support from JICA for irrigation and facility development is challenging due to difficulties in procuring materials and the unstable security situation on the ground. Although the transfer of irrigation management to the private sector is underway, the sustainable operation and maintenance of facilities remain a challenge due to insufficient management know-how and underdeveloped operational structures. Under these circumstances, a realistic approach is to prioritize the restoration of the production base in key hubs, aiming for a resumption of production through the maximum utilization of limited resources for short-term soil improvement and technical guidance.

Meanwhile, as production relocates from the south to central-western and western regions, growers face significantly increased costs for soil improvement and fertilization due to the prevalence of Podzolic soils⁴¹, which are characterized by high acidity and low fertility. Additionally, changes in water

³⁹ Water International. "Prospects for restoration of Ukraine's irrigation system". Published online: 2025-03-13. <https://www.tandfonline.com/doi/full/10.1080/02508060.2025.2472718#d1e752>, (Accessed 2025-07-01).

⁴⁰ UKRAINE CRISIS ANALYSIS TEAM. "Ukrainian Agriculture: Promoting Resilience in the Face of Upheaval". 2024-03. https://fscluster.org/sites/default/files/2024-05/Ukrainian_Agriculture_Report_compressed.pdf, (Accessed 2025-12-23).

⁴¹ Soil Protection Institute of Ukraine (SPIU). "The State of Soil in Ukraine: Features, degradation and impact of

availability and growing conditions have elevated the risk of diseases such as blight and viral infections, necessitating that producers secure appropriate control technologies and materials.

Although large-scale enterprises possess advanced cultivation technologies and irrigation equipment, they bear the substantial cost burden of facility development and soil improvement associated with relocation. Adapting to new soil conditions and managing pests and diseases requires further technical investment. In contrast, SMEs lack the necessary funds and know-how, even as their need for soil improvement and irrigation facilities grows. This has delayed their adaptation to new production environments, leading to notable declines in yield and quality. In these relocation sites, short-term support for soil improvement, fertilization techniques, and disease control guidance is required. Over the medium to long term, sustainable soil improvement support, dissemination of cultivation techniques adapted to regional characteristics, and enhancement of disease management technologies will be crucial. For SMEs, it is necessary to strengthen their production base by combining subsidies for soil improvement and facility installation with technical cultivation guidance.

However, in both the southern regions and the relocation sites, securing sufficient funds and personnel remains difficult due to the deteriorating financial and security environments. As stated at the beginning of this chapter, implementing large-scale infrastructure development or comprehensive measures for restoring and strengthening the production base is extremely difficult at present. Therefore, the most practical course of action for the time being is to proceed steadily with limited support measures, such as technical guidance and extension activities that leverage existing resources.

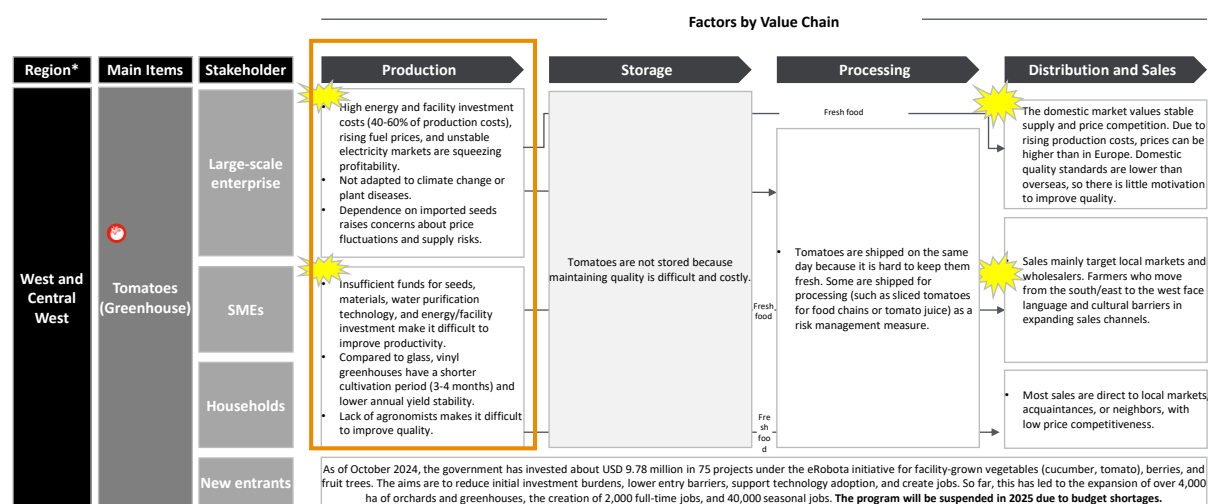


Figure 2.4.3 Factors of Production Challenges by Region, Crop, and Type of Enterprise (Greenhouse Tomatoes)

(5) Soaring Introduction and Maintenance Costs (Greenhouse Tomatoes)

In greenhouse tomato cultivation, soaring introduction and maintenance costs are diminishing price

war” . https://esdac.jrc.ec.europa.eu/public_path/EUSO/4rd-young-soil-researchers-forum/02_The-State-Soil-Ukraine_22.10.2024.pdf, (Accessed 2025-07-25).

competitiveness. Greenhouse cultivation requires significant electricity and fuel for temperature, humidity, and irrigation control, yet the sector continues to face infrastructure damage and energy supply instability caused by the invasion⁴². Furthermore, securing the initial investment for facility construction and materials, as well as the working capital, represents a major barrier for SMEs and households.

Consultations with some SMEs revealed that energy costs, which already account for 40-60% of total production costs, rose by another 30% in 2025. In response, these enterprises are engaging in thorough cost management, such as building self-designed greenhouses and drainage/irrigation systems, and utilizing hot air fans, hot water heating, and off-peak electricity. Some are also using homemade fermented fertilizers to avoid external procurement costs. For trellising and irrigation, they employ efficient materials like curtain wires and drip tape. Immediate support needs identified at the facility level include achieving energy self-sufficiency, introducing mini tractors, acquiring processing and refrigeration equipment, and enhancing secondary facilities like warehouses and heating systems. Securing an independent power supply (e.g., through inverters, generators, or renewable energy) is particularly critical to mitigate external risks, as power outages in winter can cause not only crop damage but also catastrophic losses from frozen systems and burst pipes. There is also a demand for mini tractors to reduce labor, refrigeration units (both stationary for facilities and mobile for field use), small-scale processing equipment accessible to SMEs (100 kg to 1,000 kg capacity), and heating systems that can use diverse fuel sources and improve warehouse efficiency.

Furthermore, while plastic-covered greenhouses have lower initial investment costs than glass ones, they present the challenge of a shorter cultivation period of only three to four months, which limits year-round yield stability. It was also confirmed that since greenhouse cultivation is a relatively new method in the region, the development of agronomists is insufficient, making it difficult to achieve quality improvements.

In this context, subsidies for the introduction and maintenance of greenhouse facilities are already available from the FAO and the Government of Ukraine. The FAO provides grants to SMEs, individuals, and cooperatives in sectors such as berries, vegetables, fisheries, dairy, honey, wine, and non-timber forest products. The grant amounts are up to UAH 370,000 (approximately €3,200) for small enterprises and up to UAH 925,000 (approximately €23,000) for larger ones, with a co-financing rate ranging from 10% to 50% depending on the sector and region. The program operates in four western oblasts and parts of Dnipropetrovsk oblast, with monitoring conducted by the FAO. The third cycle of this program is scheduled to continue in 2025^{43, 44}.

⁴² ESSfeed.com. "Greenhouse agriculture grows in Ukraine". 2021-05-26. <https://essfeed.com/greenhouse-agriculture-grows-in-ukraine/>, (Accessed 2025-07-25).

⁴³ О Ф И С З РОЗВИТКУ ПІДПРИЄМНИЦТВА ТА ЕКСПОРТУ ДЕРЖАВНА УСТАНОВА Дія Міністерство аграрної політики та продовольства України. "State programme for the provision of grants for the establishment or development of horticulture, berry growing, viticulture, and greenhouse farming". 2023. <https://dija.gov.ua/services/grant-na-sad>, (Accessed 2025-12-15).

⁴⁴ Ганна Антонюк (Hanna Antonyuk), FAO. "Грантова підтримка FAO та ЄС для малих та мікро виробників аграрної продукції, 3-й грантовий цикл". 2024-12-17. <https://www.dar.gov.ua/news-list/fao-ta-ievropeyskiy-soyuz-rozpochinayut-tretyi-grantoviy-tsikl-spryamovaniy-na-pidvishchennya-stiykosti-ukrayinskih-fermeriv/>, (Accessed 2025-12-15).

Separately, the Government of Ukraine offers a grant program called "eRobota" to reduce the initial investment burden and lower the entry barrier for greenhouse cultivation. This program, managed by the Ministry of Economy (Ministry of Economy, Environment and Agriculture), aims to foster entrepreneurship and employment. It targets legal entities or individual entrepreneurs and covers projects in orchards, berry fields, vineyards, and greenhouses. The grant covers up to 70% of project costs, with a ceiling of UAH 10 million (approximately €248,000) for orchards and UAH 7 million (approximately €173,000) for greenhouses. The required self-financing rate was increased from 30% to 50% in 2024. Applicants for greenhouse projects must have proven land rights for at least seven years and are obligated to create a certain number of jobs (e.g., 14 full-time employees per ha) ⁴⁵.

As of October 2024, the government had invested approximately USD 9.78 million in greenhouse cultivation through eRobota, resulting in the addition of over 4,000 ha of orchards and greenhouses and the creation of 2,000 full-time and 40,000 seasonal jobs. Although some support was suspended in 2025 due to budget shortages, it is scheduled to resume in 2026⁴⁶. Therefore, for JICA, it is advisable to consider a realistic and sustainable support strategy that focuses on collaboration with existing grant programs and emphasizes complementary assistance, such as technology dissemination and human resource development.

2.4.2 Challenges and Strategies in Processing

As indicated in the stakeholder analysis, Ukraine's vegetable processing sector is primarily operated by large-scale enterprises. However, the overall scale of the industry remains limited, a situation which presents a challenge of significant opportunity loss. This structural problem is analyzed to be linked to multiple factors, including the unstable procurement of raw materials and a lack of access to processing facilities for SMEs. This section provides a detailed examination of these key challenges and the corresponding response strategies.

⁴⁵Fresh Plaza. "Ukrainian farmers receive €2.3M in grants for orchards and greenhouses" . 2025-03-12. <https://www.freshplaza.com/europe/article/9713117/ukrainian-farmers-receive-eur2-3m-in-grants-for-orchards-and-greenhouses/>, (Accessed 2025-12-15).

⁴⁶ RADA (Legislation of Ukraine). "ПОРЯДОК надання грантів для створення або розвитку тепличного господарства". 2025-11-28. <https://zakon.rada.gov.ua/laws/show/738-2022-%D0%BF#n347>, (Accessed 2025-12-15).

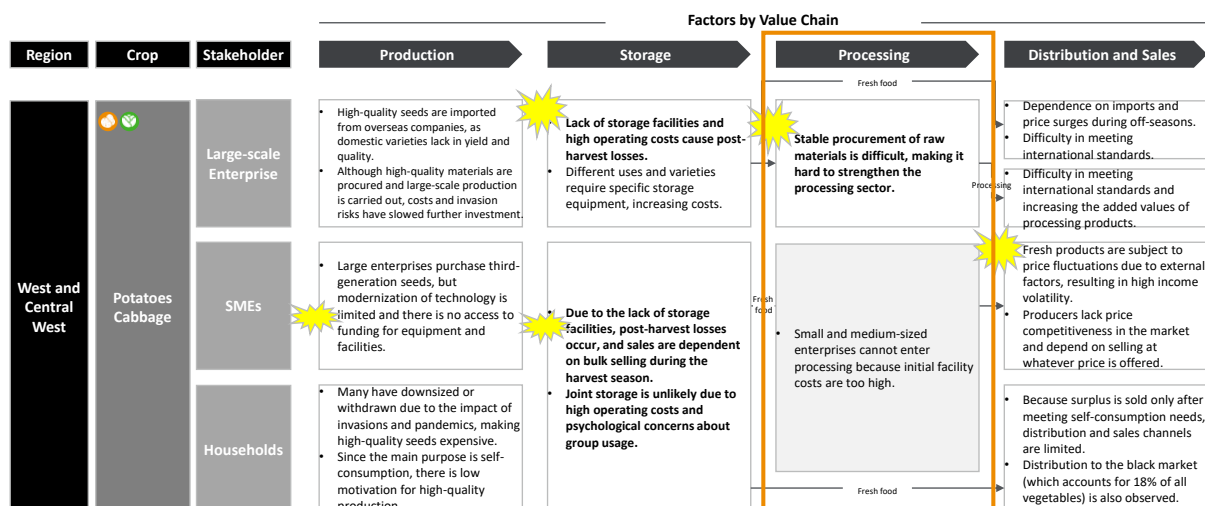


Figure 2.4.4 Factors of Processing Challenges by Region, Crop, and Type of Enterprise (Potatoes and Cabbage)

(1) Instability of Raw Material Procurement (Potatoes and Cabbage)

In Ukraine, the insufficient cultivation of potato and cabbage varieties suitable for processing has resulted in raw material shortages, leading to instances where foreign processing companies have withdrawn from the market⁴⁷. Although domestic processing varieties are available, households, which account for most of the production, exhibit a strong tendency to prioritize short-term profitability⁴⁸. They often opt to cultivate fresh market varieties for sale in the fresh market, which provides quicker cash returns. Consequently, processors face difficulties in securing a planned supply of raw materials, which leads to instability in their production schedules and, ultimately, to a decline in the quality and volume of their processed goods.

As a short-term response, it is proposed to provide technical guidance to SMEs and households on the cultivation of processing varieties, and to disseminate best practices to stimulate their interest in high-value addition. Furthermore, supporting the introduction of a contract farming model to connect these producers with processing companies is expected to build a mutually beneficial relationship, one that provides producers with stable sales channels while ensuring a consistent supply of raw materials for processors.

(2) Lack of Access to Processing Facilities for SMEs (Potatoes and Cabbage)

For SMEs and households, the barriers to entry into the processing industry are extremely high due to the substantial initial investment required. Even if they were to individually install small-scale processing facilities, they would face difficulties in securing sales channels and improving profitability,

⁴⁷ Latifundist. “Від кукурудзи до картоплі фри: МАІС створює перший в Україні завод з переробки картоплі”. 2025-10-22. <https://latifundist.com/interview/874-vid-kukurudzi-do-kartopli-fri-mayis-stvoryuye-pershij-v-ukrayini-zavod-pererobki-kartopli>, (Accessed 2025-12-22).

⁴⁸ Бізнес-кейси. “Тори врожаю, що гниє. Чому українські фермери викидають тонни овочів на звалища”. 2020-05-18. <https://thepage.ua/ua/business/fermerstvo-yak-biznes-chomu-ukrayinski-agrariyi-vikidayut-tonni-ovochiv-na-zvalisha>, (Accessed 2025-12-15).

as they cannot leverage economies of scale with their limited volume of raw materials. There have been reported cases where cooperatives introduced small-scale processing hubs in the past, but these initiatives failed to become established because they could not generate revenues commensurate with the investment costs⁴⁹, highlighting the necessity of building a sustainable business model.

To address these challenges, a conceivable short-term response is to provide financial assistance that promotes the modernization of existing facilities at large-scale enterprises. It is envisioned that combining this support with the stabilization of raw material supply through contract farming with SMEs would allow the assistance to become more inclusive, extending its benefits beyond only the large enterprises.

There are initiatives where SMEs collaborate with processors, such as some cooperatives that have established systems for joint collection, sorting, and supplying raw materials to processing plants. A notable success story is the "Berehovo Krai Dariv" (Gift of the Berehove Region) Agricultural Cooperative in the western Zakarpattia Oblast. This cooperative successfully implemented a "regional value chain enhancement model" by building a joint collection and sorting system to provide a stable supply of raw materials (cucumbers) to a local processing plant. This model achieved both income stability for producers and stable raw material procurement for the processor, contributing to the creation of over 50 jobs⁵⁰. Furthermore, as evidenced by USAID's support for joint post-harvest packing facilities⁵¹, the international community shows a tendency to support such collaborative efforts, which hold the potential to foster the development of unique local brands.

However, as stated previously, the establishment and operation of agricultural cooperatives are generally not recommended given Ukraine's cultural and institutional context. Therefore, supporting SMEs through a contract farming model is considered to have greater potential for development in Ukraine.

⁴⁹ RAU. "Спільна переробка для малих фермерів: як це може відбуватися.", 2021-05-26. <https://rau.ua/novyni/spilna-pererobka/>, (Accessed 2025-07-25).

⁵⁰ Закарпаття онлайн Beta. "Кооператив "Дари Березівщини" на Закарпатті доводить ефективність співпраці фермерів". 2006-07-27. <https://zakarpattia.net.ua/News/1738-Kooperatyv-Dary-Berehivshchyny-na-Zakarpatti-dovodyt-efektyvnist-spivpratsi-fermeriv>, (Accessed 2025-07-25).

⁵¹ Fresh Plaza. "Lower yield of potatoes in Ukraine, imports increasing". 2024-12-12. <https://www.freshplaza.com/north-america/article/9687505/lower-yield-of-potatoes-in-ukraine-imports-increasing/>, (Accessed 2025-07-01).

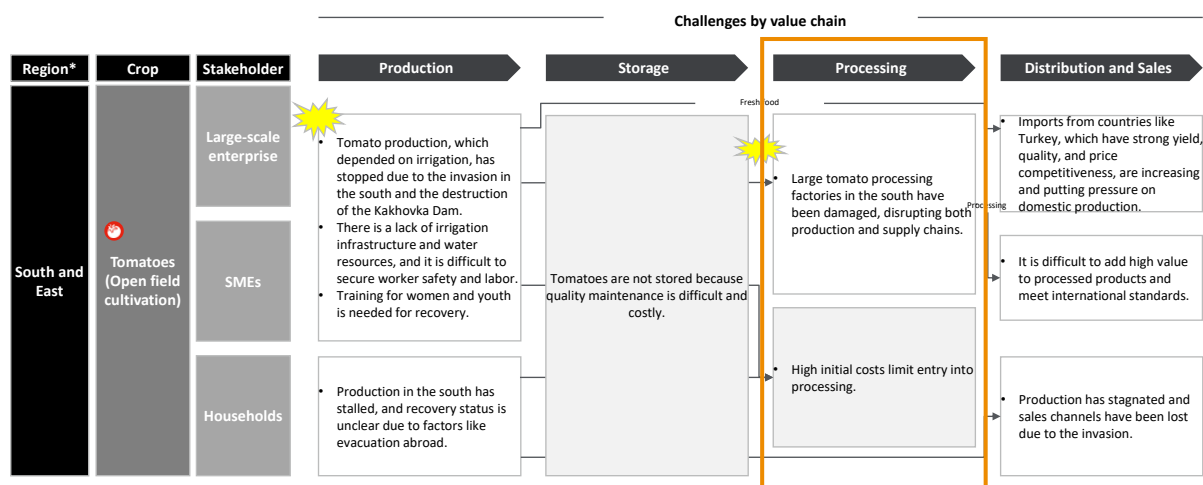


Figure 2.4.5 Factors of Processing Challenges by Region, Crop, and Type of Enterprise (Open-field Tomatoes)

(3) Supply Chain Reconstruction Following Direct Damage to Processing Hubs (Open-Field Tomatoes)

The destruction of the Kakhovka Dam in 2023 inflicted devastating damage on the tomato industry in southern Ukraine. Because production and processing facilities were concentrated in this region, the supply chain has been disrupted, leading to a stagnation in supply to both domestic and export markets. As a result, many large-scale enterprises are faced with the need to relocate their processing facilities and rebuild their raw material procurement networks.

Several challenges exist in reconstructing the entire supply chain for Ukraine's open-field tomato processing industry. First, production capacity has decreased significantly compared to pre-invasion levels, as major processing plants in the south have been damaged or forced to cease operations. The tomato processing industry has been particularly affected, with the occupation of Kherson Oblast and the destruction of the Kakhovka Hydroelectric Power Plant severing raw material supply networks and making stable procurement from company-owned fields and contract farmers difficult. Furthermore, labor shortages are pronounced, and securing and developing specialized personnel is a major challenge. On the financial front, high domestic interest rates and the cautious stance of financial institutions hinder facility restoration and production expansion. Additionally, rising energy and logistics costs, coupled with restrictions on export routes, are reducing the overall cost competitiveness of processed goods⁵¹. Under these circumstances, major processing companies have been forced to respond. For example, Chumak, after losing its own factories, has sustained its business by outsourcing production to other domestic and international plants, though its plans for new factory construction have stalled due to macroeconomic and security risks. Meanwhile, Agrofusion, despite having its southern plants damaged or shut down, is proceeding with the reconstruction of its production system, starting with the reopening

of its factory in Mykolaiv Oblast⁵².

While a comprehensive reconstruction of the entire supply chain is required, its realization faces multiple hurdles. Support targeted at SMEs would likely have a limited impact due to their low production volumes stemming from a lack of processing infrastructure. The expansion of contract farming, essential for ensuring a stable supply of raw materials, is also difficult due to the low risk tolerance of farmers and the preference of major manufacturers for a vertical integration model. Given these circumstances, supporting the infrastructure reconstruction of key large-scale enterprises through "individual company support" is considered the most effective approach for industrial recovery. However, from JICA's perspective, it is difficult to consider support targeted at specific private companies, particularly due to the high invasion risks in the southern region and the principle of inclusivity. Therefore, a realistic policy is to determine the timing for full-scale intervention in the open-field tomato sector from a medium- to long-term perspective, contingent upon factors such as the reduction of invasion risks in the south to an acceptable level.

2.4.3 Challenges and Strategies in Distribution and Sales

The sale of products produced in Ukraine is primarily handled through distributors, retailers, and exports. Key challenges in this area include the volatility of domestic prices influenced by external factors, and the need to address certification requirements to strengthen the export competitiveness of processed goods.

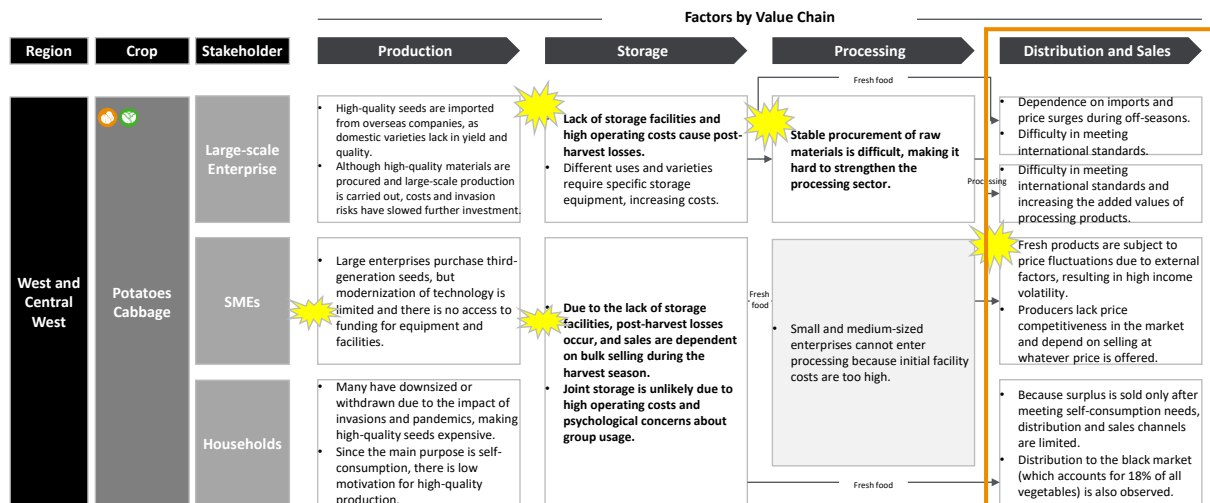


Figure 2.4.6 Factors of Distribution and Sales Challenges by Region, Crop, and Type of Enterprise (Potatoes and Cabbage)

⁵² LIGA.net. "Right to the tomatoes. How "Chumak" and Agrofusion work." 2025-08-26. <https://biz.liga.net/en/all/prodovolstvie/article/right-to-the-tomatoes-how-chumak-and-agrofusion-work>, (Accessed 2026-01-07).

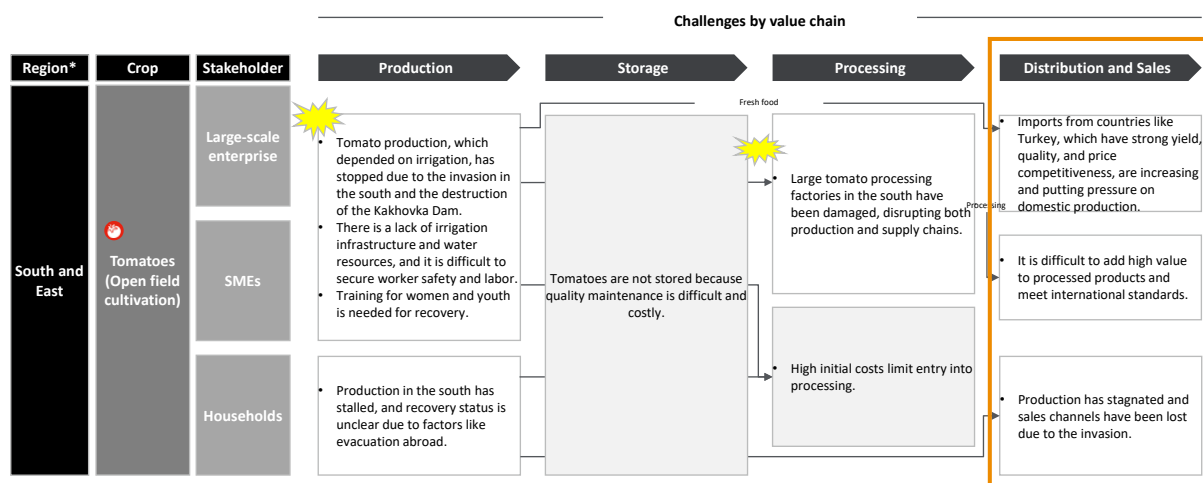


Figure 2.4.7 Factors of Distribution and Sales Challenges by Region, Crop, and Type of Enterprise (Open-field Tomatoes)

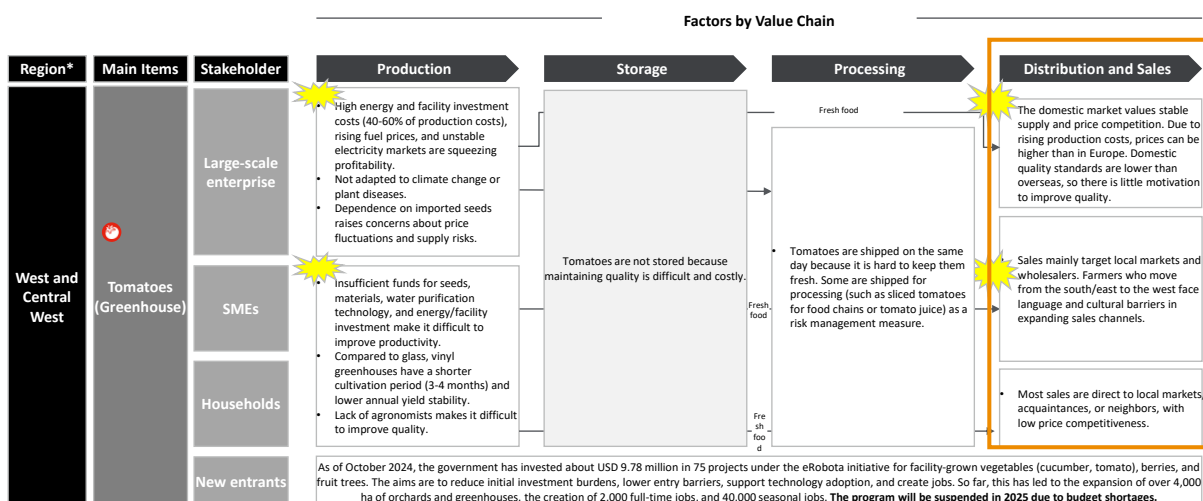


Figure 2.4.8 Factors of Distribution and Sales Challenges by Region, Crop, and Type of Enterprise (Greenhouse Tomatoes)

(1) Fluctuations in Domestic Market Prices Due to External Factors (Potatoes, Tomatoes, Cabbages)

In the agricultural sector of Ukraine, price volatility in the domestic market, driven by external factors, is severely impacting the profitability of SMEs. This price instability is attributed to a combination of the following complex factors.

Firstly, climate change is a primary driver of significant price fluctuations. As of 2023, a notable 18% decrease in fresh potato production was confirmed compared to the previous year. This decline is attributed to factors such as frost damage during the sowing season, heavy rains during the growing period, and record-high temperatures and droughts. The increasing impact of climate change is destabilizing the potato market year by year, significantly affecting the income of fresh potato farmers.

To cope with this market instability, it has been observed that some farmers are diversifying their crops, relying on higher-profitability crops such as berries or more stable-revenue crops like maize for risk mitigation.

Secondly, price volatility is also caused by the import of foreign products. In the tomato market, the competitiveness of Ukrainian tomatoes has been substantially weakened, particularly by low-cost imports from Türkiye. Turkish tomatoes benefit from lower transportation costs due to geographical proximity and possess strong price competitiveness from large-scale production systems, allowing them to expand their share in the Ukrainian domestic market. In fact, from January to October 2025, imports from Türkiye accounted for 64.3% of Ukraine's total tomato imports. In response to this situation, on July 17, 2025, the Government of Ukraine introduced import restrictions by imposing anti-dumping duties of 26.9% on Turkish tomatoes and 20.1% on cucumbers for a period of five years. This measure aims to mitigate the impact of the influx of low-cost Turkish vegetables on domestic greenhouse farmers and to ensure a fair competitive environment and price stability⁵³. Meanwhile, the Turkish government has strongly opposed this tariff measure, labeling it "commercially unjust," and is considering legal action through the World Trade Organization (WTO) ⁵⁴.

Thirdly, because of the full-scale invasion, the destruction of the Kakhovka Dam has led to a surge in vegetable prices. According to interview with some producers, the water supply system from the Kakhovka Reservoir was indispensable, irrigating 250,000 ha of land and serving the Kakhovskyi district, a critical region for Ukraine's overall vegetable production. It has been confirmed that the destruction of this vital infrastructure caused major producers to withdraw from the area, resulting in soaring vegetable prices.

Furthermore, SMEs exhibit a structural dependence on bazaars (local markets) for 70-80% of their agricultural sales, primarily due to the immediate cash payments they offer. However, transactions in bazaars are predominantly based on negotiated prices⁵⁵, which often leads to value loss at the point of sale. This reliance is necessitated by the inability of SMEs to meet the strict transaction requirements of retail stores and their lack of financial resources and capacity to introduce the necessary washing, sorting, and packaging lines. Consequently, they are unable to secure sales channels to retailers and are forced to depend on bazaars.

As countermeasures, several approaches can be considered. Firstly, providing technical assistance to SMEs through guidance and training on agricultural techniques, business management, and quality standards can enhance their productivity. Secondly, it is effective to promote initiatives that allow for

⁵³ NH Logistics. "Ukraine Boosts Tomato Imports to 81,800 tons". 2025-12-12. <https://nh-logistics.com/our-news/news/ukraine-28/>, (Accessed 2025-12-15).

⁵⁴ EAN Networks. "Kyiv Moves to Shield Farmers as Ukraine Imposes New Tariffs on Turkish Vegetables". 2025-07-17. <https://ean-network.com/kyiv-moves-to-shield-farmers-as-ukraine-imposes-new-tariffs-on-turkish-vegetables/>, (Accessed 2025-12-15).

⁵⁵ Бізнес-кейси. "Тори врожаю, що гниє. Чому українські фермери викидають тонни овочів на звалища". 2020-05-18. <https://thepage.ua/ua/business/fermerstvo-yak-biznes-chomu-ukrayinski-agrariyi-vikidayut-tonni-ovochiv-na-zvalisha>, (Accessed 2025-12-15).

effect verification while minimizing risks, such as introducing small-scale equipment and materials at vocational training schools and conducting demonstrations and technology validations tailored to local needs at government research institutions and associations. Thirdly, for SMEs aiming to expand sales channels and improve quality, it is effective to provide "soft" support. This includes offering know-how to build sales models that reduce dependence on bazaars, facilitating business matching opportunities, and developing platforms for information sharing.

(2) Enhancing Export Competitiveness through Certification Compliance (Potatoes, Tomatoes, and Cabbage)

The competitiveness of Ukrainian vegetables in the international market is limited due to delayed compliance with quality standards and certifications, which hinders the enhancement of their export potential. The national standards of Ukraine (DSTU) ⁵⁶ for fresh produce have simpler requirements compared to other international standards^{57, 58}. In contrast, EU standards and certifications, such as GLOBALG.A.P., demand a high level of management throughout the entire production process. Consequently, a significant qualitative gap exists between the two.

For SMEs, which often lack financial resources and technical information, bridging this gap through process revisions and capital investment presents a significant challenge. Furthermore, the EU's phytosanitary standards for potatoes are exceptionally strict, meaning the import of fresh potatoes is not practically permitted⁵⁹. Similarly, strict regulations in the EU market for cabbage are assumed to limit the incentive for export enhancement to a few processed products, such as sauerkraut.

As a result, while some advanced large-scale enterprises are pursuing international certifications and introducing advanced processing and packaging technologies, compliance with the environmental regulations and the Packaging and Packaging Waste Regulation (PPWR) of export markets, including the EU, is not yet sufficient across the industry⁶⁰.

⁵⁶ POTATO BUSINESS. "A New National Standard for Table Potatoes in Ukraine". 2023-05-30. <https://www.potatobusiness.com/agro-news/a-new-national-standard-for-table-potatoes-in-ukraine/>, (Accessed 2025-07-25).

⁵⁷ Економічна правда. "Альтернатива кредитам і простий спосіб поповнити обігові кошти". 2023-09-05. <https://epravda.com.ua/columns/2023/09/5/703963/>, (Accessed 2025-07-25).

⁵⁸ GLOBAL G.A.P. "INTEGRATED FARM ASSURANCE CONTROL POINTS AND COMPLIANCE CRITERIA". 2021-10-22. https://documents.globalgap.org/documents/211022_GG_IFA_CPCC_FV_V5_4-1-GFS_en.pdf, (Accessed 2025-07-25).

⁵⁹ European Commission, "Phytosanitary requirements for the import of potatoes into the EU", https://food.ec.europa.eu/plants/plant-health-and-biosecurity/plant-health/phytosanitary-requirements/requirements-import-potatoes-eu_en, (Accessed 2025-07-25).

⁶⁰ UKRPEC. "Head of UKRPEC Speaks at Seminar on New EU Regulation Held as Part of IFFIP-2025 in Kyiv". 2024-06-13. <https://ukrpec.org/en/head-of-ukrpec%D1%81-speaks-at-seminar-on-new-eu-regulation-held-as-part-of-iffip-2025-in-kyiv/>, (Accessed 2025-07-25).

	State Standard of Ukraine(DSTU)	EU Standards	GLOBALG.A.P.
Purpose feature	- Assuming the domestic market and the former Soviet Union, compliance is recommended. - Define product appearance and classification - Major retail chains such as ATB and Silpo require higher grades of transactions	- Must comply with distribution within the EU - Clearly document product appearance, classification + labeling rules	- Voluntary certification for international export markets (requested by buyers) - Specify hygiene and management requirements for the entire farm-to-shipment process
Potatoes	- DSTU1:9221 (revised June 2023) Table potatoes - Category:Extra/First/Second - Classification by size, germination rate, lesion and level of damage	- UNESE FFV-52 Reg. (EU) 543/2011 Annex 1 - Extra/Class I /Class II - Classification by size, uniformity of shape, presence or absence of germination (no germination), cleanliness of skin, compliance with labeling obligations	- IFA CPCC v5.4-1 - Certification from pesticide use records, hygiene status of harvesting tools, presence or absence of bud prevention treatment, water source management, worker hygiene education, etc. - Three companies in Ukraine (Poltava-Sad Ltd., TOV Agro LV Limited, Brovary Kartoplya LLC)
Tomatoes	- DSTU3246 Round, large tomatoes - First Commercial Grade: Color, hardness, and presence of lesions are evaluated	- UNESE FFV-52 Reg. (EU) 543/2011 Annex 1 - Extra/Class I /Class II - Classification with emphasis on variety, color, sugar content, shape, hardness, presence of pests and diseases, uniformity of overview, and compliance with labeling obligations.	- IFA CPCC v5.4-1 - Certification from agricultural use records, hygiene status of harvesting tools, greenhouse temperature control, water source management, worker hygiene education, etc. - In Ukraine, 2 companies (Uman Greenhouse Complex, LLC TK Dniprovsky) acquired
Cabbage	- DSTU7037 White cabbage - At least First Commercial Grade defined: Insect bites, lesions, leaf shape, and adhesion are evaluated - Separated by early and late varieties	- UNESE FFV-09Reg. (EU) 543/2011 Annex 1 - Extra/Class I /Class II - Classification by spherical shape, density, presence of pests and diseases, presence of spoilage, transportation resistance in terms of freshness, and compliance with labeling obligations	- IFA CPCC v5.4-1 - Certification from agricultural use records, hygiene status of harvesting tools, storage temperature control at harvest, water source management, worker hygiene education, etc. - No confirmation of acquisition in Ukraine

Source: JICA survey team based on the official websites of DSTU (<https://www.potatobusiness.com/agro-news/a-new-national-standard-for-table-potatoes-in-ukraine/>), UNESE (https://eur-lex.europa.eu/eli/reg_impl/2011/543/oj/eng), GLOBALG.A.P. (https://documents.globalgap.org/documents/211022_GG_IFA_CPCC_FV_V5_4-1-GFS_en.pdf) quality standards.

Figure 2.4.9 Quality Standards in Ukraine and International Markets

Compliance with these international standards requires advanced management of the entire production process and substantial capital investment. This poses a particular challenge for SMEs, which often find it difficult to comply due to a lack of funds and technical information. To address this issue, in the short term, an effective measure is to provide technical training on quality management for SMEs to enhance their immediate competitiveness. In the medium to long term, the adaptive capacity of the entire industry should be strengthened by promoting the gradual harmonization of domestic standards with international ones as a national strategy.

A notable example of SMEs and households collaborating to establish a cold chain with export potential is the "Овочі Станиці" (Vegetables of Stanytsia) agricultural cooperative in the eastern Luhansk Oblast. In this cooperative, approximately 100 producer households have united to establish a common brand, "Stanytsi," for products such as cherry tomatoes. With support from USAID, they developed refrigeration and packaging facilities, establishing a cold chain that enables them to supply distant domestic markets while maintaining product quality. This case demonstrates how the cooperative model can overcome challenges that are difficult for individual small-scale producers to address, such as branding and the establishment of an advanced distribution system⁶¹. It serves as a model that can be utilized for the medium- to long-term engagement of SMEs and households. On the other hand, as previously mentioned, it is important to note the difficulties associated with the formation and operation of cooperatives.

2.4.4 Challenges and Strategies across the Entire Value Chain

The analysis of the entire value chain reveals that SMEs in particular face significant losses at the

⁶¹ ProAgro Group. "Кооператив на Луганщині будуватиме овочевий хаб". 2020-11-19. <https://proagro.com.ua/news/ukr/39893.html>, (Accessed 2025-07-25).

production and storage stages. Furthermore, a distribution and sales structure capable of handling high-value-added transactions is underdeveloped. The lack of diversification in sales channels restricts access to more profitable markets, leading to the value depreciation of their produce. To remedy this situation, it is essential to optimize the value chain by adopting an integrated approach from production to distribution and sales, thereby maximizing the value of agricultural products.

Optimizing the value chain requires strengthening quality control at the production stage and developing an environment that enhances added value by improving storage facilities and washing/sorting lines. Furthermore, at the distribution and sales stage, it is necessary to establish mechanisms to maximize sales value. Particularly in the domestic market, it is crucial to transition away from the dependence on existing open-air markets and street sales and to establish a system for the stable supply of standardized products. This will increase opportunities for farmers and enterprises to sell their harvests at higher prices and help stabilize their revenues. On the other hand, for SMEs to take the lead in launching new processing businesses or establishing and operating cooperatives presents high hurdles from the perspectives of investment burden and business risks. Therefore, an effective approach is to focus on existing processing companies as a core and connect the value chain to upstream producers.

By strengthening the entire value chain centered on existing processing companies, it becomes possible to achieve both the development of the entire industry and deliver benefits to producers, rather than limiting support to specific enterprises. This is highly significant from the perspectives of legitimacy and effectiveness as a public policy.

Introducing contract farming is an effective measure to implement the above-mentioned strategic approach. According to the FAO, contract farming is an agreement between producers (farmers) and buyers (companies, distributors, etc.) on the terms of production and sale, clearly defining aspects such as price, quantity, quality standards, delivery schedules, and payment methods in a contract. The agreement often includes provisions for handling non-performance, force majeure clauses, dispute resolution methods, and terms for the contract period, renewal, and termination. Additionally, specifications for production methods and the provision of services such as seeds, fertilizers, technical guidance, and logistical support may also be included in the contract. Local interviews have confirmed that contract farming is expanding, particularly for vegetables like potatoes, between processing manufacturers and producers, contributing to the securing of stable prices and stable production and sales conditions. The existence of motivated farmers among small- and medium-sized enterprises who are willing to consolidate and sell fresh produce to retailers has also been identified.

The promotion of such contract farming has been gaining global attention in recent years to overcome the limitations of traditional market transactions and to enhance stable supply, quality control, and transaction transparency for agricultural products⁶². Especially when combined with processing and storage, it can promote market participation for producers and enhance the competitiveness of the entire

⁶² FAO. "Contract Farming". <https://www.fao.org/in-action/contract-farming/about/what-is-contract-farming/en>. (Accessed 2025-12-19).

value chain.

2.5 Proposals

2.5.1 Additional Financial Support for the Government of Ukraine's Storage Facility Grant Program (Potatoes and Cabbage) (Japan ODA Loan)

The first proposed measure is for JICA to provide additional financial support to the Government of Ukraine's planned grant program for the construction of storage facilities, with the condition that it includes "linkages with small-scale enterprises." This measure is intended to support the government's plan to address the fundamental challenge of insufficient storage infrastructure in the vegetable value chain, while simultaneously promoting the inclusion of particularly vulnerable small-scale enterprises.

In Ukraine's potato and cabbage production, the absolute shortage of modern storage facilities serves as a bottleneck for the entire value chain. This lack of infrastructure not only leads to post-harvest quality deterioration and losses but is also a root cause of extreme market price volatility. Currently, many producers are forced to ship their products all at once during the harvest season, which leads to a market price collapse due to oversupply. Conversely, during the off-season, supply tightens, and prices surge due to an increase in imports. This cycle has become normalized, destabilizing the business environment for producers.

Although there is investment appetite from the private sector for storage facilities, significant hurdles exist. Firstly, modern storage facilities are not merely warehouses but require advanced management functions tailored to the intended use of the stored crops. For instance, potatoes intended for potato chips require precise temperature control at a relatively high 8 - 9 ° C to prevent "low-temperature sweetening," where starch converts to sugar and causes blackening during processing. Seed potatoes, on the other hand, require delicate temperature control: after a curing period post-harvest (above 10 ° C), the temperature is gradually lowered by 0.5 ° C per day to eventually maintain a dormant state at 3 ° C. These control systems necessitate numerous sensors to constantly monitor temperature, humidity, and CO₂ levels, along with automated control systems, which significantly increases the initial investment cost. According to interviews with SMEs, constructing a single modern refrigerated room with a 1,000-ton capacity costs approximately €135,000, making it difficult to finance with their own capital alone (information from local interviews).

Secondly, the financing environment for such large initial investments is challenging. For SMEs, particularly in the agricultural sector, the environment for financing projects that require high initial investment remains severe. Although the government has established low-interest loan schemes such as the "5-7-9 Affordable Loan"⁶³ to promote domestic crop production by SMEs, accessing these programs requires the submission of detailed business plans and passing strict evaluations of creditworthiness and

⁶³ State sites of Ukraine. "Ministry of Economy: Government continues funding the Affordable Loans at 5-7-9% programme". 2025-06-09. <https://www.kmu.gov.ua/en/news/minekonomiky-uriad-prodovzhuie-finansuvaty-prohramu-dostupni-kredyty-5-7-9>, (Accessed 2025-12-23).

management status by banks⁶⁴. Consequently, not all SMEs can meet these requirements, and those who cannot are forced to rely on conventional loans with high interest rates and strict collateral conditions. This situation acts as a barrier to entry for their large-scale capital investments. Furthermore, the Government of Ukraine currently prioritizes military and defense expenditures and the protection of the energy sector, making it difficult to allocate sufficient budget to agricultural infrastructure and related fields.

According to interviews with officials from the Government of Ukraine (Department of Agrarian Development, Ministry of Economy, Environment and Agriculture), the government is planning a grant program to subsidize a portion of storage facility construction costs, aiming for a full-scale launch from 2026 onward to promote private investment while curbing its own fiscal burden (detailed in 2.4.1 (3)). However, the biggest bottleneck for this large-scale plan, which aims to resolve an estimated storage capacity deficit of approximately 340,000 tons as of early 2025, is a lack of financial resources. To ensure the feasibility of the plan, additional financial support from the international community is necessary, and this proposed measure is designed to address this government funding need.

This measure outlines a framework whereby JICA would supplement a portion of the resources for the government's planned storage facility grant program (scheduled for 2026 onwards) through an Japanese ODA Loans. To ensure that JICA's support contributes to strengthening the value chain for small-scale enterprises, rather than being limited to assistance for individual companies, specific conditions will be attached to the use of these funds.

The overview of the government's grant program, which forms the basis of this support, is as follows. The plan aims to construct a total of 69 modern storage facilities with a total capacity of 340,000 tons over three years from 2026 to 2028. The program will target corporate farms and agriculture-related enterprises, subsidizing 30-50% of the construction costs (up to a ceiling of UAH 20 million or € 460,000 per facility). Ownership of the constructed facilities will belong to the grant recipients, but they will be obligated to create new jobs corresponding to the facility's scale (e.g., 12 or more new jobs for a 3,000-6,000-ton facility).

JICA proposes to provide financial support for this government program through Japanese ODA Loans. From the perspective of inclusivity, this support will be conditioned on prioritizing the selection of “farmers and enterprises that plan to newly implement or expand existing contract farming with small-scale enterprises of 1 ha or larger.” This will create an incentive for companies utilizing the grant to involve surrounding small-scale enterprises in their supply chains, providing technical guidance and engaging in contract farming with the prospect of stable procurement, in parallel with their own business expansion.

The total cost of the government's planned three-year grant program is estimated at approximately

⁶⁴ RADA (Legislation of Ukraine). “Про надання фінансової державної підтримки”. 2025-12-16. <https://zakon.rada.gov.ua/laws/show/28-2020-%D0%BF?lang=en#Text>, (Accessed 2026-01-07).

UAH 1.38 billion (approx. JPY 5.1 billion). JICA's contribution is envisioned to be around JPY 1.0 billion. This would cover the grant funds for approximately 14 facilities, corresponding to about 20% of the total 69 facilities planned.

Regarding the fund flow for this scheme, the Japanese ODA Loans provided by JICA will be disbursed to designated financial institutions for the grant (e.g., Oschadbank, Ukreximbank) under the management of the supervising government ministry (envisioned to be the Department of Agrarian Development, Ministry of Economy, Environment and Agriculture). These financial institutions will identify and select applicants who meet the additional conditions set by JICA and disburse the grants from a special account established for this purpose.

It should be noted that under the current conflict situation, a prudent approach is required for support via an Japanese ODA Loans due to country risk. The realization of this measure will necessitate overcoming several challenges, including the stabilization of the political situation and an improvement in Ukraine's creditworthiness. On the other hand, resolving the chronic shortage of storage facilities is critically important for strengthening the entire potato and cabbage value chain—from production to distribution and sales—and the potential spillover effects upon realization are significant.

Through the implementation of this project, a new storage capacity of 340,000 tons will be secured over three years, leading to a reduction in post-harvest losses, stabilization of market prices, and the creation of a more predictable market environment for both producers and consumers. Furthermore, JICA's conditional support will create concrete opportunities for small-scale enterprises in the vicinity of at least 14 modern storage facilities to participate in contract farming. It is anticipated that this will enable small-scale enterprises to receive technical guidance on quality improvement while securing stable sales channels.

Project Objective

To provide financial support to the Government of Ukraine's storage facility construction grant program, planned for implementation from 2026, under the condition of "linkages with small-scale enterprises," thereby addressing the shortage of storage infrastructure, promoting price stabilization, and facilitating the participation of small-scale enterprises in modern value chains.

Beneficiaries

Large, SMEs that receive the grant (approx. 14 facilities).

Small-scale enterprises that participate in the contract farming scheme as a result of this grant program.

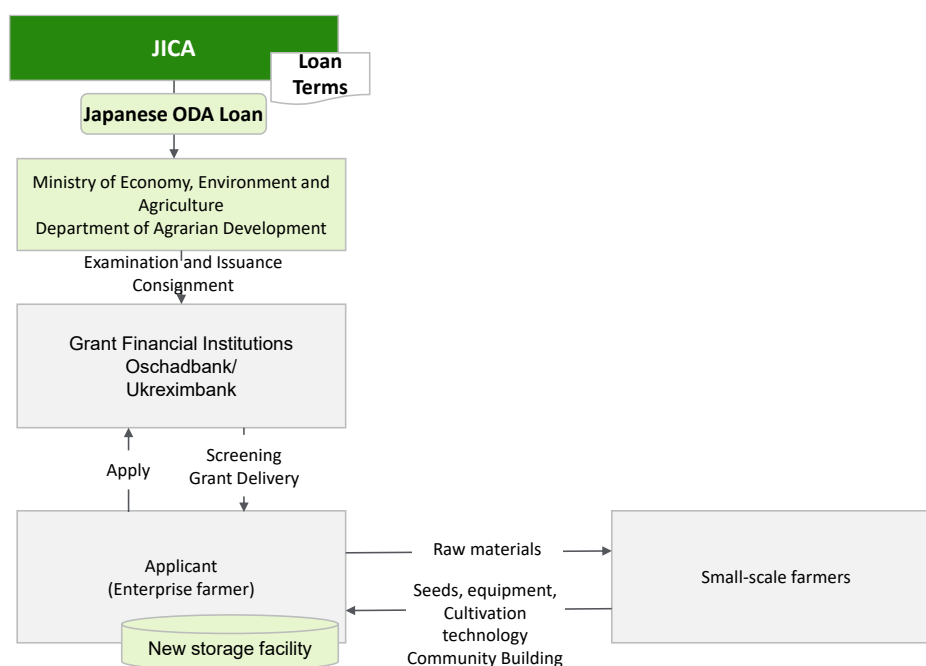
Implementing Agencies

Ministry of Economy, Environmental Protection and Agriculture of Ukraine (Department of Agrarian Development)

State-designated financial institutions such as Oschadbank and Ukreximbank.

Other Considerations

- It is necessary to reach a clear agreement with the Government of Ukraine on establishing "implementation of contract farming with small-scale enterprises" as an additional selection criterion. Furthermore, the evaluation methodology for applicants meeting this additional condition and the verification of contract farming implementation require further study.
- The government's grant program is expected to be implemented from 2026 to 2028, and JICA's financial support is also anticipated for the same period. Therefore, depending on the security situation, there are risks of delays in the construction of storage facilities or destruction due to the invasion, which will require flexible project management.



Source: JICA survey team

Figure 2.5.1 Additional Financial Support for the Government of Ukraine's Storage Facility Grant Program (Potatoes and Cabbage) (Japan ODA Loan)

2.5.2 Support for Establishing a Fresh Produce Contract Farming Model (Potatoes) (Grant Aid, Private Sector Investment Finance [PSIF] or Technical Cooperation Project)

The second measure is to support the establishment of a contract farming model for fresh produce centered on "leader farmers," to resolve the structural sales channel issues faced by small-scale enterprises in Ukraine. Here, "leader farmers" refer to medium-sized enterprises that aim to become hubs for consolidating and selling produce from other farmers, as their own production volume is insufficient to meet the demands of retailers. This measure, by combining multiple JICA support schemes, aims to build a supply chain that meets retailers' requirements for quality, lot size, and delivery times. The goal is for leader farmers to consolidate fresh produce from small-scale enterprises and secure

stable sales channels through contract farming. Through this initiative, it is expected that small-scale enterprises will expand their sales channels, which will in turn create incentives for increasing yields and improving technology, leading to an increase and stabilization of their income in the medium to long term.

In Ukraine, 70-80% of fresh vegetables produced by small-scale enterprises are traded in informal open-air markets and through street sales⁶⁵, where prices are highly volatile, making stable income security a distant prospect. According to interviews and local media reports, in years of abundant harvest, prices collapse, and cases where harvested vegetables must be discarded in the fields are observed. This situation is attributed to the following combination of factors.

Firstly, there are the strict transaction requirements imposed by major retailers. These retailers demand that their suppliers provide uniform quality, supply in stable lot sizes, and adhere strictly to delivery deadlines. However, it is nearly impossible for individual small-scale enterprises to meet these conditions on their own, as their production volumes are limited, and quality is often inconsistent.

Secondly, there is a lack of processing capacity for fresh produce sales. Products intended for retailers require washing, sorting, and consumer-sized packaging (e.g., 1 - 1.5 kg bags), but small-scale enterprises lack the capital to invest in such equipment. As a result, they miss opportunities to add value and are forced to sell their produce unwashed and in bulk at low prices in bazaars⁶⁶.

Thirdly, these challenges have created an information gap and a lack of trust between small-scale enterprises and major retailers. Farmers are often unaware of the procedures for transacting with retailers, while retailers, in turn, find it difficult to identify reliable partners among small-scale enterprises who can ensure a stable supply.

This measure aims to bridge this gap by identifying and developing motivated and capable "leader farmers" to act as intermediaries. The goal is to establish a new contract farming model where these leader farmers serve as a hub, organizing surrounding small-scale enterprises to conduct direct transactions with major retailers. While agricultural cooperatives would typically be expected to act as such intermediaries for consolidation and sales, their establishment and operation in Ukraine are challenging due to political, cultural, and organizational factors, requiring the development of alternative mechanisms (as detailed in 2.4.1). In a context where collective marketing through agricultural cooperatives is difficult in Ukraine, this model enables individual small-scale enterprises to collaboratively solve the challenges they face, bringing benefits to the entire value chain.

Interview with local companies have revealed the existence of potato producers who already have experience with contract farming with processing manufacturers. These producers have expressed a

⁶⁵ Бізнес-кейси. "Гори врожаю, що гниє. Чому українські фермери викидають тонни овочів на звалища". 2020-05-18. <https://thepage.ua/ua/business/fermerstvo-yak-biznes-chomu-ukrayinski-agrariyi-vikidayut-tonni-ovochiv-na-zvalisha>, (Accessed 2025-12-15).

⁶⁶ EastFruit. "Dirty potatoes on supermarket shelves as an indicator of problems in the Ukrainian vegetable business". 2007-12-29. <https://east-fruit.com/en/news/dirty-potatoes-on-supermarket-shelves-as-an-indicator-of-problems-in-the-ukrainian-vegetable-industry/>, (Accessed 2025-12-15).

willingness to take the initiative in the future to organize surrounding farmers and develop a contract farming model for fresh produce. However, they face challenges, including a lack of funds for installing collection, shipment, and packaging facilities, as well as insufficient capacity for network building and operational management required to consolidate small-scale enterprises.

To address this, this measure identifies such producers as potential "leader farmers" and provides support for their facilities and network-building capabilities, thereby promoting the expansion of sales channels and quality improvement for SMEs dealing in fresh produce.

① Support for the Introduction of Collection, Shipment, and Packaging Facilities (Private Sector Investment Finance [PSIF] or Grant Aid)

Under this component, selected leader farmers will receive support to introduce facilities for the joint processing of fresh produce collected from surrounding small-scale enterprises. This will be provided through either PSIF or Grant Aid.

In the case of PSIF, financial support would be channeled through financial institutions (including those headquartered outside Ukraine but with domestic branches). In the case of Grant Aid, equipment would be provided to the Department of Agrarian Development and the Department of Rural Development a state-owned leasing company such as "UkrAgroLeasing"⁶⁷. Specific equipment support will focus on establishing washing, sorting, and packaging lines to meet the requirements of retail chains. This will enable leader farmers to standardize their products, add value, and gain the capacity to deliver directly to major retail chains.

② Human Resource Development for Small-Scale Enterprises and Establishment of a Quality Assurance System through Vocational Training Schools (Technical Cooperation Project)

Under this component, JICA will collaborate with vocational training schools it has previously supported (e.g., two schools under the former Ministry of Agrarian Policy and Food, three under the Ministry of Education and Science) to develop and implement special curricula on cultivation techniques and quality management for small-scale enterprises. Leader farmers will contribute to the curriculum development by communicating the quality standards required by their own businesses and retailers. This will enable small-scale enterprises to acquire the technical skills necessary to participate in contract farming for fresh produce by attending the vocational training school's program.

The vocational training schools will be responsible for training small-scale enterprises and matching them for contract farming. By providing a form of quality assurance or certification to farmers who complete this curriculum, the leader farmers can then prioritize these certified farmers as partners for contract farming, providing them with seeds, materials, and cultivation guidance. This will improve the quality level of the entire supply chain, build trust with retail chains, and enable continuous sales of fresh produce.

⁶⁷ UKRAGROLEASING. <https://ukragroleasing.com.ua/pro-kompaniyu/zagalna-informacziya/>, (Accessed 2026-01-09).

In addition to the implementation of measures ① and ② above, combining this with the measure 2.5.1 is expected to increase the storage capacity of leader farmers and build the necessary infrastructure for this contract farming scheme.

The implementation of this measure is expected to create a virtuous cycle for small-scale enterprises, which are in a particularly vulnerable position within Ukraine's agricultural sector. The most significant effect is that participation in contract farming will allow small-scale enterprises to break away from volatile open-air markets and enable sales at stable and favorable prices. Based on contracts with leader farmers that guarantee the purchase of their entire harvest at a predetermined favorable price, farmers will be freed from the risk of price collapses during the harvest season and will be able to engage in more predictable business planning throughout the year. Furthermore, joint washing, sorting, and packaging will reduce the amount of non-standard produce that previously had low market value or was discarded, thereby increasing the overall value of their products.

From a broader, strategic perspective, this project holds the impact of establishing a model case for a modern supply chain. By directly connecting major retailers with organized groups of small-scale enterprises, it can demonstrate a concrete path to overcoming challenges such as information asymmetry and lack of trust. It offers the advantage of providing a stable supply of high-quality, traceable domestic fresh produce, while also meeting the growing interest of major retailers in "local sourcing" and local production for local consumption⁶⁸.

Project Objective

To address the structural sales channel issues faced by small-scale enterprises in Ukraine by establishing a contract farming model for fresh produce centered on "leader farmers." The project aims to expand their sales channels at stable and favorable prices, create incentives for improving yields and technology, and achieve increased and stabilized income in the medium to long term.

Beneficiaries

Small-scale enterprises

Leader farmers

Implementing Agencies

Ministry of Economy, Environment and Agriculture (Department of Rural Development and Department of Agrarian Development)

Foreign-affiliated financial institutions

The state-owned leasing company "UkrAgroLeasing"

Leader farmers

⁶⁸ ATB Corporation. "The company 'ATB-Market' systematically supports Ukrainian producers of vegetable products". https://www.atb.ua/en_US/section/our-news-4/article/the-company-atb-market-systematically-supports-ukrainian-producers-of-vegetable-products-134, (Accessed 2025-12-15).

Vocational training schools

Applicability of Japanese Technologies

In introducing a fresh produce contract farming model, washing, sorting, and packaging carried out by lead farmers will form the core processes of aggregation and shipment to meet retailers' requirements for quality, lot size, and delivery deadlines. As a prerequisite, Ukraine faces unstable power supply and high costs under the current invasion, and its characteristic chernozem (black soil) adheres strongly when wet and hardens when dry, making it difficult to remove; wash water also becomes dirty quickly. Therefore, it is necessary to perform pre-processing to remove dry soil and stones before washing. Field surveys also confirmed demand for optical sorters capable of efficiently detecting and selecting greening and rot in potatoes, as well as packaging technologies that can handle diverse sizes and weights, such as small retail packs of 1.0–1.5 kg, anticipating shipments to retail stores.

For removing stones and clods at harvest, a domestic reference is NARO's "AI Potato Harvester" being tested in Hokkaido. The machine uses cameras, and an AI detector mounted on a sorting conveyor, along with flaps, to detect objects among potatoes harvested in the field. Stones and clods are flicked onto a discharge conveyor by the flaps, while the potatoes are conveyed via a receiving conveyor to the main tank⁶⁹. By performing stone and clod separation during harvest (normally done post-harvest) the system reduced the number of workers needed for sorting from an average of four to two, achieving labor savings. In the 2024 demonstration phase, it trained on 70,000 potato cases and 80,000 cases of foreign material, achieved an 84% removal rate and a 0.24% false detection rate, and aims for commercialization within a few years^{70, 71}.

As a next-generation technology for potato sorting, Shibuya Seiki Co., Ltd.'s new external appearance sensor is notable. The company holds over a 50% domestic share for end-to-end grading systems from sorting to shipping (90% for AI-based graders)⁷². Its systems are widely introduced at agricultural cooperatives (JA) across Japan and are deployed in several Asian countries⁷³. Leveraging proprietary optics, image analysis, and AI, the new external appearance sensor integrates and analyzes images from up to six cameras to accurately identify fine scratches, greening, diseases, and even damage likely to lead to future rot, areas that conventional image processing struggled with. This enables high-speed, highly accurate sorting that previously required

⁶⁹ NARO (National Agriculture and Food Research Organization). "AI Potato Harvester: Automatic Sorting of Foreign Material with AI Cameras". https://www.naro.go.jp/event/files/20250312_hokkaido_sfc_poster_02.pdf, (Accessed 2026-02-04).

⁷⁰ The Hokkaido Shimbun. "AI Introduced in Tokachi Potato Fields Cuts Labor in Harvesting and Seed Potato Sorting". 2025-10-3. <https://www.hokkaido-np.co.jp/article/1219966/>, (Accessed 2026-02-04).

⁷¹ The Nikkan Kogyo Shimbun. "NARO and Partners Use AI to Identify Stones and Clods During Potato Harvesting, Greatly Reducing False Detections". 2025-06-19. <https://www.nikkan.co.jp/articles/view/00752165>, (Accessed 2026-02-04).

⁷² 216 Remarkable Technologies Ehime Is Proud Of. "State-of-the-Art AI Grading and Sorting System". <https://sugowaza-ehime.com/company/detail03.php?id=243>, (Accessed 2026-02-04).

⁷³ Shibuya Corporation. "Medium-Term Management Plan 2027". 2024-08-26. <https://www.shibuya.co.jp/pdf/news20240826-2.pdf>, (Accessed 2026-02-04).

skilled workers, reducing manual sorting while maintaining throughput⁷⁴.

For weighing and packaging, it is necessary to introduce lines that can flexibly accommodate retailers' trading conditions. In this regard, Ishida Co., Ltd.'s high-precision weighers are used for fresh produce both domestically and overseas⁷⁵. A pioneer that commercialized combination weighing in the 1970s, Ishida now has more than 60,000 installations worldwide⁷⁶. The series can weigh everything from bulky produce to sticky cut/diced fresh items at high speed and high accuracy, and it can be integrated into packaging processes. Specifically, by flexibly combining hoppers (weighing modules) from 0.05 liters to 7 liters, the system reduces product giveaway and achieves up to 210 weighments per minute⁷⁷, and it supports building integrated lines from weighing through packaging⁷⁸. The company also has an authorized agent in Kyiv, with local engineers who can support equipment installation and maintenance close to production sites⁷⁶.

In summary, by considering local needs, Ukraine's unique soil characteristics, and instability factors under the current invasion, designing and implementing a line that combines dry pre-processing, sorting, and weighing/packaging can enable the construction of a stable supply system that meets retail requirements.

Other Considerations

- To build trust between SMEs and large companies, transparency in contract terms and the establishment of long-term relationships are essential.
- Further investigation and verification are required to assess whether the state-owned leasing company "UkrAgroLeasing," a potential recipient of Grant Aid, has the capacity to execute equipment leasing, and whether the designated financial institutions and the Department of Agrarian Development can monitor the leasing company.

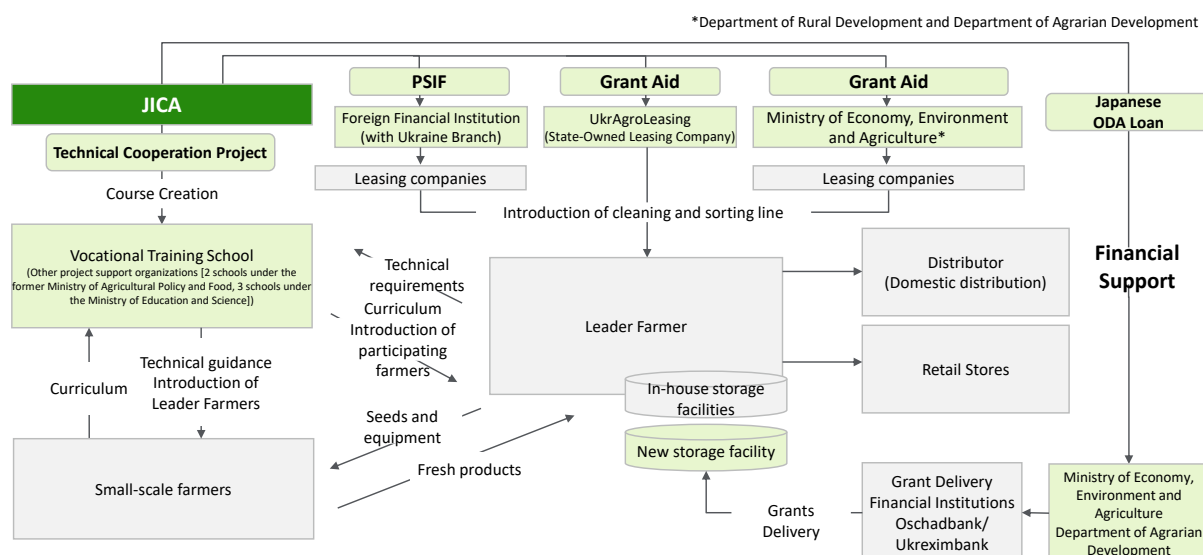
⁷⁴ Shibuya Seiki Co., Ltd. <https://www.shibuya-sss.co.jp/product/new/02/>, (Accessed 2026-02-04).

⁷⁵ Ishida Co., Ltd. <https://www.ishida.co.jp/ww/jp/products/weighing/ccw/>, (Accessed 2026-02-02).

⁷⁶ MIRRATEX ENGINEERING. <https://www.mirrutex.org/uk/equipment/multigolovochnye-dozatory/multigolovochnyi-vesovoi-dozator-ishida-rv>, (Accessed 2026-02-04).

⁷⁷ Ishida Co., Ltd. "Combination Weighers". <https://www.ishida.co.jp/ww/jp/products/weighing/ccw/>, (Accessed 2026-02-04).

⁷⁸ Ishida Europe. "Fresh Produce". <https://www.ishidaeurope.com/en/sectors/food-applications/fresh-produce/>, (Accessed 2026-02-04).



Source: JICA survey team

Figure 2.5.2 Support for the Expansion of Processed Product Contract Farming Models (Potatoes) (PSIF)

2.5.3 Support for the Expansion of Processed Product Contract Farming Models (Potatoes) (PSIF)

The third measure is to support the expansion of the contract farming model for processed goods by utilizing PSIF. This measure aims to simultaneously enhance the competitiveness of the entire value chain and stabilize the income of small-scale enterprises, starting with processing manufacturers who have a particularly strong ambition for growth.

In Ukraine, the processing rate for potatoes remains extremely low. As of 2022, only 3-5% of the total harvest was industrially processed (with the proportion processed into potato chips and dried mashed potatoes being only about 0.3%). This level is extremely low compared to developed countries (e.g., the EU, where it is approximately 93% or higher)^{79,80}. Approximately 70-80% of fresh potatoes produced by many small-scale enterprises are traded in informal open-air markets with volatile prices⁸¹, making it difficult to secure a stable income.

This situation is underpinned by a combination of challenges that exist across the entire value chain, from production to sales. Firstly, there is a delay in the modernization of the production stage. Many

⁷⁹ TCH Project. "Processing and storage of plant products". <https://tch.kiev.ua/en/projects/processing-and-storage-of-plant-products/>, (Accessed 2025-12-23).

⁸⁰ Ruslan Lavrov, Lyudmyla Remnova, Iryna Sadchykova, Hennadii Mazur, Mykola Tymoshenko, Volodymyr Kozlovskiy, Serhii Kozlovskiy. "Investments in the Sustainable Development of the Potato Sector in Ukraine based on the Optimal Balance of Production and Consumption". WSEAS TRANSACTIONS on BUSINESS and ECONOMICS. 2022-01-11. <https://wseas.com/journals/bac/2022/a365107-1547.pdf>, (Accessed 2025-12-15).

⁸¹ Бізнес-кейси. "Тори врожаю, що гниє. Чому українські фермери викидають тонни овочів на звалища". 2020-05-18. <https://thepage.ua/ua/business/fermerstvo-yak-biznes-chomu-ukrayinski-agrariyi-vikidayut-tonni-ovochiv-na-zvalisha>, (Accessed 2025-12-15).

small-scale enterprises lack access to the capital needed to introduce modern agricultural machinery and irrigation equipment and thus continue to rely on traditional farming methods. This results in productivity levels that fall short of the European average and high vulnerability to external factors such as climate change.

Secondly, inadequate post-harvest management systems pose a significant challenge. The lack of proper storage facilities and post-harvest technologies results in very high rates of quality deterioration and loss after harvesting. Due to the shortage of storage, farmers are forced to ship their produce all at once during the harvest season, leading to a market price collapse from oversupply.

Thirdly, these production and post-harvest issues directly translate to a weak position in the market. Due to extreme price volatility, price collapses during harvest and sharp increases during the off-season. This makes business planning difficult for farmers and increases their revenue fluctuation risk. As a result, many farmers are forced to accept prices dictated by intermediaries, preventing them from earning a stable income (as detailed in 2.4.4).

Therefore, expanding the contract farming model using PSIF is an effective means to promote the modernization of the entire value chain, led by processing manufacturers, and to stabilize the income of small-scale enterprises through technical and financial support and stable sales contracts. In addition, increasing the processing rate is directly linked to value creation and increased exports, making it an essential strategy for the sustainable development of Ukrainian agriculture.

Furthermore, the Government of Ukraine has positioned the promotion of the processing industry, which enhances the added value of agricultural products, as one of its key policies within the national strategy for strengthening the competitiveness of the agricultural sector⁸². In line with this policy direction, some advanced processing companies have already begun to introduce contract farming models. In these models, the processing manufacturer provides small-scale enterprises with seed potatoes, materials, and cultivation techniques, and purchases the entire harvest at a predetermined price. This is a model that benefits both parties, as it stabilizes income for the farmers and ensures a planned and stable supply of high-quality raw materials for the manufacturers.

This measure aims to expand these promising contract farming models in Ukraine by utilizing JICA's PSIF scheme. The support will focus on large-scale local processing manufacturers in the potato processing sector that have a clear growth strategy, promoting the modernization and expansion of their production lines. This is expected to lead to the diversification of Ukrainian processed goods and the strengthening of export competitiveness.

The measure also aims to revitalize the regional economy by expanding the base of contract farmers who partner with these processing manufacturers, thereby improving the productivity and income

⁸² Ministry of Agrarian Policy and Food of Ukraine. "STRATEGY OF AGRICULTURE & RURAL DEVELOPMENT OF UKRAINE - 2030". 2024-06-07. https://www.agroberichtenbuitenland.nl/site/binaries/site-content/collections/documents/2024/06/07/ua-strategy-agro-and-rural-development/EN_Strategy+of+agro+Ukraine-2030_v1.pdf. (Accessed 2025-12-07).

stability of SMEs.

The primary method of support will be JICA's PSIF, implemented in line with the processing manufacturers' phased business expansion plans. Companies currently engaged in potato processing in the country source a certain percentage of their raw materials from contract farmers and are planning to expand their contract farmer network and their production lines for high-value-added products. Furthermore, they are considering the use of potato residues and by-products from the processing stage for energy, which is expected to improve environmental and social sustainability by reducing production costs, effectively utilizing waste, and cutting greenhouse gas emissions.

JICA envisions providing PSIF to support the business expansion plans of these processing manufacturers, addressing their capital needs for introducing new production lines. In parallel with PSIF, combining it with technical cooperation projects is also considered effective. This could include soft-side support such as providing know-how on operating contract farming models, introducing Japanese quality control methods, and training agricultural instructors for contract farmers.

The implementation of this project is expected to generate a wide range of impacts in Ukraine's agriculture and processing sectors, including improved income stability and productivity for SMEs, revitalization of the regional economy and job creation, and enhanced competitiveness and export promotion for the processing industry.

Project Objectives

To contribute to income improvement for small-scale enterprises and to the enhancement of the international competitiveness of Ukraine's agriculture and processing industries. This is achieved by expanding the production capacity of a private processing manufacturer through PSIF, thereby enlarging the contract farming model centered on that company.

Beneficiaries

The local large-scale processing manufacturer

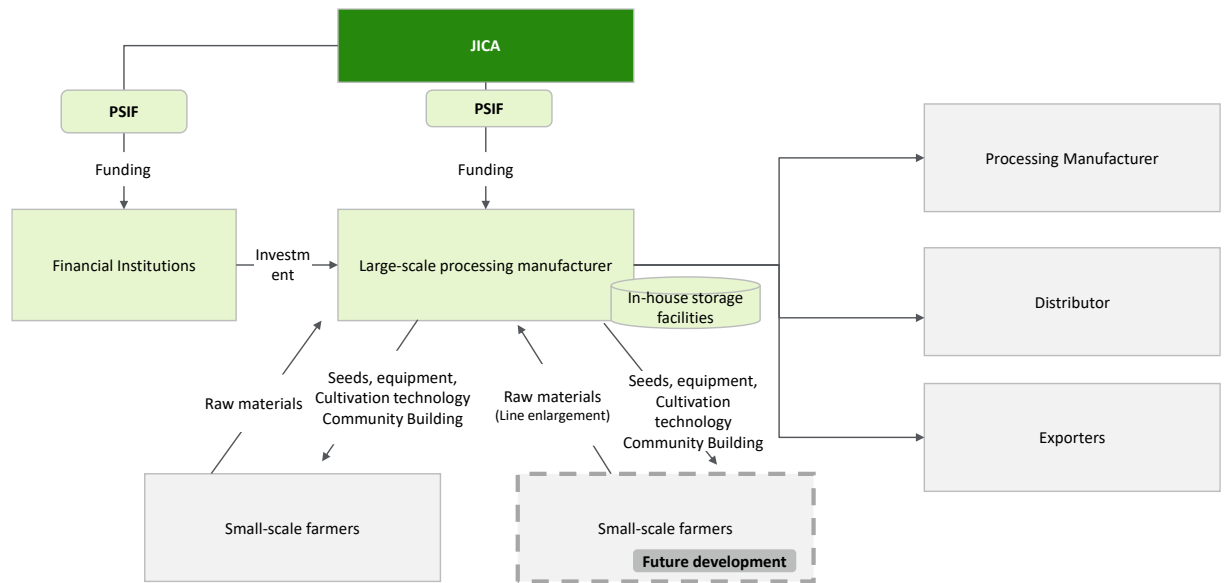
Up to approximately 200 small-scale enterprises that will participate in the contract farming scheme.

Implementing Agency

The local large-scale processing manufacturer

Other Considerations

- As this project is linked to the business strategy of a private company, its progress may be influenced by the company's financial condition and trends in the international market.
- To ensure the project's sustainability, establishing a fair and transparent transactional relationship between the company and the contract farmers is critically important.
- Furthermore, close attention must be paid to the security situation and the risk of supply chain disruptions, requiring a flexible approach to reviewing the project plan.



Source: JICA survey team

Figure 2.5.3 Support for the Expansion of Processed Product Contract Farming Models (Potatoes) (PSIF)

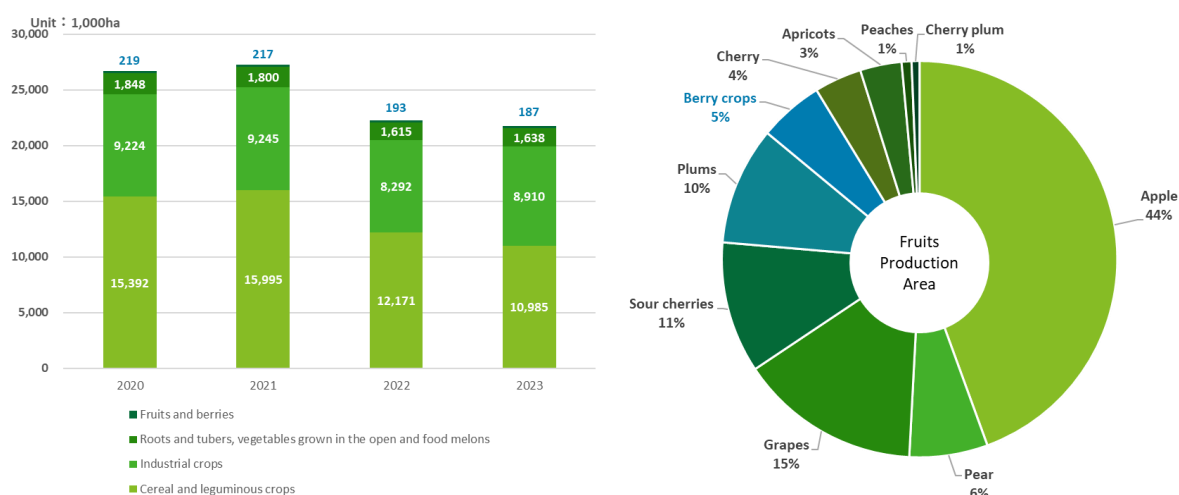
CHAPTER3 BERRY VALUE CHAIN

3.1 Overview

3.1.1 Basic Information of Production

(1) Berry Production in Ukraine

According to the State Statistics Service of Ukraine (2023), the total production area for fruits and berries in the country is 187,000 ha, which corresponds to approximately 0.9% of the total agricultural land. The area dedicated to berries accounts for about 5%. The total annual production volume of berries has remained stable, showing no significant fluctuations before or after the full-scale Russian invasion. The production is composed of strawberries (55%) and raspberries (35%). Blueberries, whose cultivation has been expanding in recent years, make up 2% of the total berry production.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

**Figure 3.1.1 Berry Production in Ukraine (2023):
Production Area by Crop (left) and Percentage of Production Area of Fruits (right)**

Most of Ukraine, including its western and northern parts, has a humid continental climate characterized by warm summers and cold winters. Additionally, the country is widely covered by Chernozem, a soil type known globally for its high fertility. These climatic and soil conditions make the region suitable for berry cultivation. Currently, grains occupy about half of Ukraine's agricultural land, forming the foundation of its crop production. Amid this situation, the Government of Ukraine is promoting agricultural diversification⁸³ to shift away from its dependence on grain production. Berries are positioned as one of the key promotional crops. As part of specific policy support, grants are provided to horticultural producers, greenhouse farms, and processing enterprises through schemes such as eRobota. Furthermore, improvements in berry varieties and cultivation techniques are being advanced

⁸³ Ministry of Economy Ukraine. "eRobota: Grants from the state for opening or developing a business". Ministry of Economy of Ukraine. 2024-05-30. <https://me.gov.ua/Documents/Detail?lang=en-GB&id=f26e87de-b597-4634-b77e-53792b7ac4a5&title=Erobota-GrantsFromTheStateForOpeningOrDevelopingABusiness>, (Accessed 2025-08-28).

by the country's research institutions⁸⁴, universities, and international donors⁸⁵. Support for exporters and assistance for producers in obtaining certifications are also expanding through private organizations like berry associations, aiming to enhance the quality and international competitiveness of Ukrainian berries.

(2) Overview of Strawberry Production

The production volume of strawberries, which remained at around 60,000 tons annually until 2021, has shown a decreasing trend in 2022 and 2023. Similarly, the cultivation area, which was approximately 8,000 ha from 2018 to 2021, decreased to 7,000 ha in 2022 and 2023. According to the State Statistics Service of Ukraine, the western and central-western regions account for more than half of both cultivation area and production volume, making them the main centers for strawberry production in the country.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

**Figure 3.1.2 Strawberry Production in Ukraine:
Production Volume Trends (left) and Production Area by Region (right)**

⁸⁴ National Academy of Agrarian Sciences of Ukraine. НАЦІОНАЛЬНИЙ НАУКОВИЙ ЦЕНТР "ІНСТИТУТ ЗЕМЛЕРОБСТВА НАЦІОНАЛЬНОЇ АКАДЕМІЇ АГРАРНИХ НАУК УКРАЇНИ". <https://zemlerobstvo.com/>, (Accessed 2025-08-28).

⁸⁵ UNIDO. "FOSTERING CLIMATE RESILIENCE IN BERRIES AND NUTS VALUE CHAIN". https://hub.unido.org/sites/default/files/publications/230215_QI%20and%20Climate%20%28EN%29.pdf, (Accessed 2025-08-28).

According to statistics from the Food and Agriculture Organization of the United Nations (FAO), the strawberry yield in Ukraine is 7.74 tons/ha, which is low compared to international standards. Several factors are considered to contribute to this low yield. Firstly, open-field cultivation, which is susceptible to weather conditions, remains predominant due to the limited adoption of advanced greenhouse systems. Secondly, increasing climate risks, such as spring frost damage, low temperatures, and heatwaves resulting from global warming, are cited as factors that constrain yields.

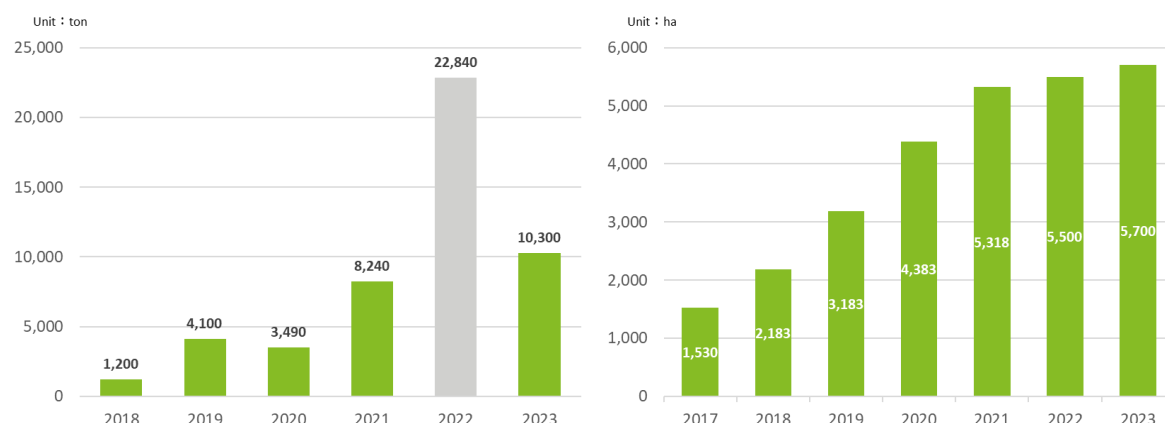
Table 3.1.1 Comparison of Strawberry Yields (2023)

	Country	Yield (ton/ha)
1	Netherlands	55.68
2	America	54.39
3	Albania	53.35
4	Israel	48.73
5	Spain	45.05
6	Greece	42.75
7	Mexico	42.02
8	Morocco	41.70
-	Ukraine	7.74

Source: FAOSTAT (<https://www.fao.org/faostat/en/#data>)

(3) Overview of Blueberry Production

According to the International Blueberry Organization (IBO), Ukraine's blueberry production reached 10,300 tons in 2023, showing a consistent upward trend from 1,200 tons in 2018. This trend is driven by growing international demand, particularly in the EU market. In response, the cultivation area in Ukraine, mainly in the western and central-western regions, expanded from 1,530 ha in 2017 to 5,700 ha in 2023. However, the IBO notes that in cold regions like Ukraine, it takes three to four years for newly planted bushes to reach stable commercial harvesting. Consequently, in 2023, the actual harvested area was only 3,183 ha out of the 5,700 ha of planted area.



Source: JICA survey team based on IBO (<https://www.internationalblueberry.org/2025-report/>)

Note: The yield for Ukraine is not explicitly stated; therefore, it has been calculated using the formula: Production / Hectares Harvested.

Figure 3.1.3 Blueberry production in Ukraine
Production Volume Trends (left) and Planting Area Trends (right)

While Ukraine's blueberry yield of 3.24 tons/ha in 2023 is low compared to other countries, improvements are expected in the future as the recently expanded cultivation areas mature. On the other hand, addressing climate risks has also become crucial for blueberry production. The risk of poor growth due to climate change is increasing, with incidents such as frost damage reducing production volumes in the spring of 2024⁸⁶ and heatwaves causing an earlier harvest and lower yields being reported⁸⁷.

3.1.2 Basic Information of Processing

Processed fruit and berry products in Ukraine are dominated by frozen items (45.1%) and beverages, mainly apple juice (41.1%)⁸⁸. While exports of these products exceed imports, the country relies heavily on imports for secondary processed goods like jams.

Berry processing is mainly focused on freezing. Although there are many small and medium-sized enterprises (SMEs) with freezing facilities, the number of companies with high-quality processing technology and sufficient production capacity to meet export standards is limited⁸⁸. These SMEs show a cautious stance toward capital investment required for advanced processing equipment and certification, owing to limited financial resources and the unstable national situation⁸⁸.

Secondary processed berry products primarily include jams, pastes, jellies, beverages, bakery/confectionery items, and dairy products⁸⁹. While some domestic companies manufacture these items, their number is smaller compared to those in freezing, and the market is oligopolistic, dominated by large corporations, including foreign-affiliated companies⁸⁸.

According to a 2024 study by the United Nations Industrial Development Organization (UNIDO)⁸⁸, berries are often exported to Poland in a semi-processed (frozen) state due to the limited number of companies with advanced processing technologies in Ukraine. In Poland, they undergo secondary processing and are then distributed in the market under Polish or other EU brands. As a result, the

Table 3.1.2 Comparison of Blueberry Yields (2023)

Country/Region	Yield (ton/ha)
World	7.91
South America	10.64
North America	6.28
Central America	6.19
Asia-Pacific	7.71
Eastern Europe	5.60
Poland	6.20
Ukraine	3.24
Western and Central Europe	6.65
Africa	12.49

Source: IBO (<https://www.internationalblueberry.org/2025-report/>)

Note: The yield for Ukraine is not explicitly stated; therefore, it has been calculated using the formula: Production / Hectares Harvested.

⁸⁶ East Fruit. "Impact of May Frosts on Ukraine's Blueberry and Raspberry Crops". 2024-05-17. <https://east-fruit.com/en/news/impact-of-may-frosts-on-ukraines-blueberry-and-raspberry-crops/>, (Accessed 2025-08-28).

⁸⁷ Fresh Plaza. "Heatwave cuts Ukrainian blueberry season short". Fresh Plaza. 2019-07-4. <https://www.freshplaza.com/latin-america/article/9123701/heatwave-cuts-ukrainian-blueberry-season-short/>, (Accessed 2025-08-28).

⁸⁸ UNIDO. Action Plans for the Green Recovery and Transformation Of the Ukrainian Food Industries. 2025-03. <https://www.unido.org/sites/default/files/unido-publications/2025-01/Action-Plans-for-Green-Recovery-and-Transformation-of-Ukrainian-Food-Industries.pdf>, (Accessed 2025-08-28).

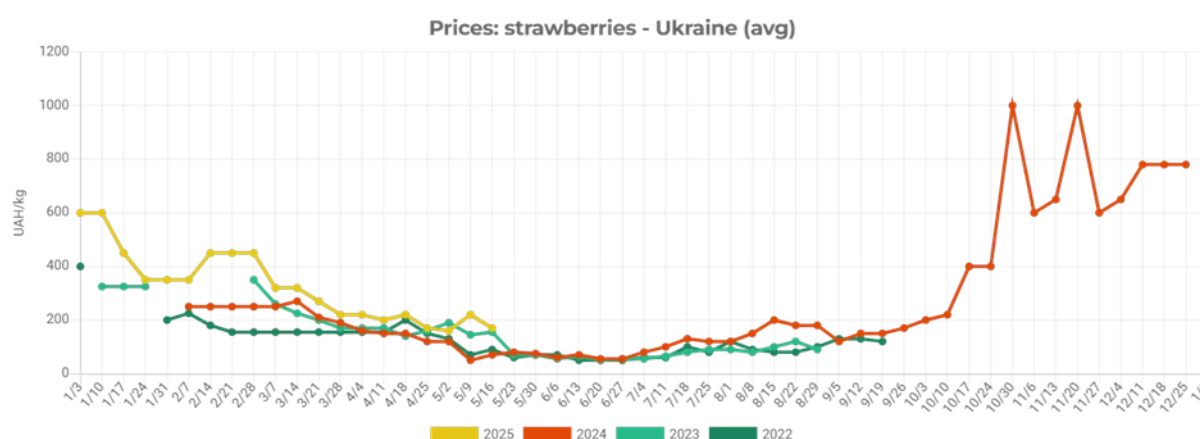
⁸⁹ Government of the Netherlands. "Entering the European market for frozen berries". Government of the Netherlands. 2024-08-13. <https://www.cbi.eu/market-information/processed-fruit-vegetables-edible-nuts/frozen-berries/market-entry>, (Accessed 2025-08-28).

estimated loss of value-added for Ukraine is €86 million.

3.2 Consumption Trends and Future Forecasts in Ukraine and Abroad

3.2.1 Domestic Consumption

Over 90% of the strawberries produced in Ukraine are consumed domestically. Domestic market prices for strawberries fluctuate significantly depending on the season, tending to be lower during the peak harvest period from May to June⁹⁰. Although some producers attempt to adjust their shipping periods by introducing protected cultivation or early and late-maturing varieties, their numbers are limited. This results in a concentration of strawberry supply in the domestic market during a specific period. While simple protected cultivation methods like low tunnels are used, the adoption of more advanced, environmentally controlled cultivation systems—which could help adjust shipping times and mitigate climate risks—has not become widespread due to high installation and maintenance costs⁸¹.



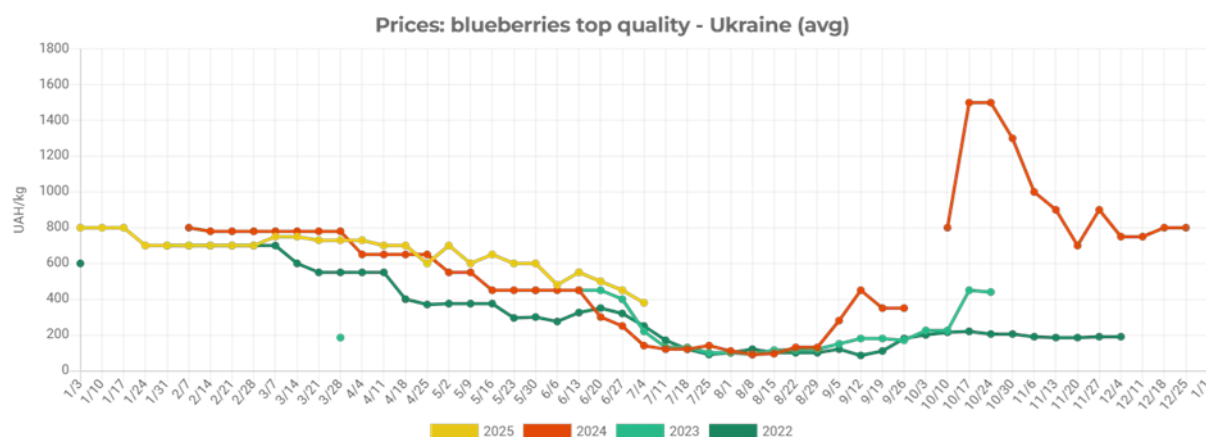
Source: East Fruit (<https://east-fruit.com/en/news/strawberry-prices-plummet-in-ukraine/>)

Figure 3.2.1 Market Price Trends of Strawberries in Ukraine

Although blueberry production is increasing primarily as an export-oriented crop for the EU market, a certain amount is also sold and consumed domestically. Similar to strawberries, domestic market prices for blueberries tend to be lower during their peak season from July to August. Consequently, the cultivation of early and late-maturing varieties, which allows for adjustment of the harvest season, is gradually expanding. In 2024 and 2025, due to the impact of abnormal weather conditions, blueberry production was lower than in typical years, leading to higher-than-average domestic market prices for those periods⁹¹.

⁹⁰ East Fruit. "Strawberry Prices Plummet in Ukraine". East Fruit. 2025-05-23. <https://east-fruit.com/en/news/strawberry-prices-plummet-in-ukraine/>. (Accessed 2025-08-28).

⁹¹ East Fruit. "Blueberry Prices Falling in Ukraine". East Fruit. 2025-07-11. <https://east-fruit.com/en/news/blueberry-prices-falling-in-ukraine/>. (Accessed 2025-08-28).



Source: East Fruit (<https://east-fruit.com/en/news/blueberry-prices-falling-in-ukraine/>)

Figure 3.2.2 Market Price Trends of Blueberries in Ukraine

3.2.2 Import

Domestic strawberry production in Ukraine ranges from 53,000 to 62,000 tons annually. In contrast, both export and import volumes (including processed products⁹²) are approximately 3,000 tons each, equivalent to only about 5% of domestic production. This supply-demand structure indicates that the vast majority of strawberries consumed domestically are locally produced, resulting in a high market self-sufficiency rate. An increase in fresh strawberry imports was observed from 2022 to 2024. It is considered that these imports are intended to supplement demand during the off-season, as the harvest seasons in the main source countries, such as Greece and Turkey.

Similar to strawberries, blueberry imports are also limited; in 2024, fresh blueberry imports totaled only 524 tons. This is attributed to several factors: annual per capita consumption of blueberries in Ukraine is below EU levels, and the recent population decline has led to a contraction of the overall domestic market. Furthermore, with the rise in export-oriented domestic production, it is considered unlikely that import demand will

Table 3.2.1 Import Volume and Value of Strawberries (2024)

item	import volume	Input Amount	Import Focus Countries
Fresh	1,655 t	\$4,476,798	Greece (87%), Turkey (8%), France (1%), Poland (1%)
Frozen	1,180 t	\$1,505,486	Egypt (89%), China (4%), Poland (4%)
Provisionally preserved	N/A	N/A	N/A
Prepared or preserved	128 t	\$394,025	Spain (44%), Turkey (20%), Egypt (17%), China (9%)

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>)

Table 3.2.2 Import Volume and Value of Blueberries (2024)

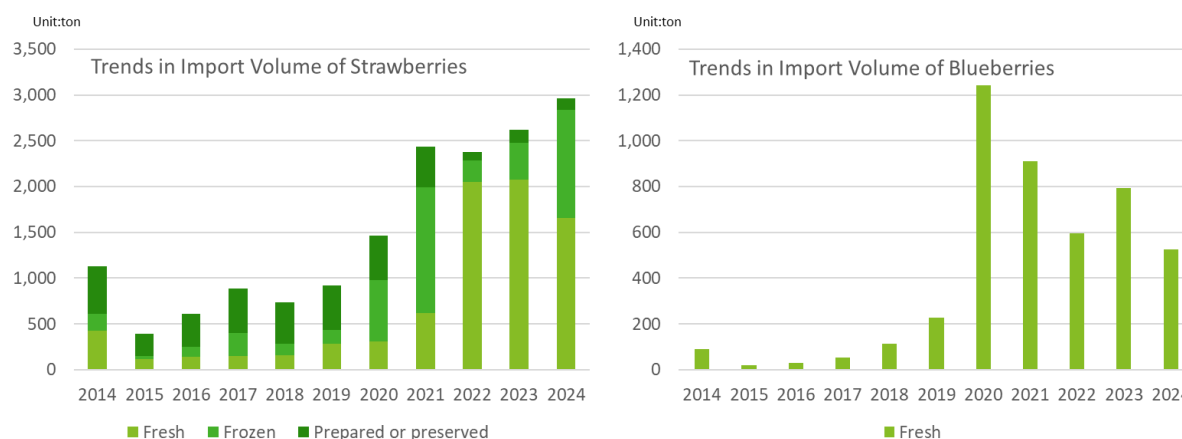
item	import volume	Import Amount	Import Focus Countries
Fresh	524 t	\$3,446,623	Spain (59%), Peru (25%), Morocco (6%), Poland (3%), Chile (3%)
Frozen	N/A	N/A	No proper HS code exists

Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>)

Note: Since a dedicated Harmonized System (HS) code for blueberries does not exist, the trade data utilized corresponds to the broader category of "cranberries, bilberries and other fruits of the genus Vaccinium," which includes blueberries.

⁹² Excluding secondary processed products such as jams and purees, the scope is limited to primary processed products that are either frozen or otherwise prepared or preserved.

expand significantly in the future.



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>)

Note: Since a dedicated HS code for blueberries does not exist, the trade data utilized corresponds to the broader category of "cranberries, bilberries and other fruits of the genus Vaccinium," which includes blueberries.

Figure 3.2.3 Trends in Import Volume of Strawberries and Blueberries in Ukraine

3.2.3 Export

Due to the short shelf life of fresh strawberries, which is only about one week even under refrigerated conditions, most exports are traded in frozen form. The primary destination is the EU market, particularly Poland. However, in the EU strawberry market, intra-regional production reaches approximately 1.3 million tons, while total imports from outside the EU are only about 23,000 tons, indicating that the majority of demand is met by production within the region. The export unit price of Ukrainian strawberries in 2024 was 2.2 USD/kg for frozen and 1.2 USD/kg for fresh.

In contrast, fresh blueberry exports reached 6,023 tons in 2024, and a substantial quantity is also exported in frozen form⁹³. Driven by growing demand in the EU, Ukrainian blueberries are exported to international markets, with exports believed to exceed

Table 3.2.3 Export Volume and Value of Strawberries (2024)

item	Output volume	Export amount	Export-focused countries
Fresh	188 t	\$233,267	Poland (58%), Romania (33%), Moldova (8%)
Frozen	3,360 t	\$7,416,059	Poland (47%), Czech Republic (21%), Germany (10%), Austria (4%)
Provisionally preserved	N/A	N/A	N/A
Prepared or preserved	153 t	\$355,385	Georgia (65%), Moldova (29%), Azerbaijan (6%)

Source: JICA survey team based on WITS

(<https://wits.worldbank.org/CountryProfile/en/UKR>)

Table 3.2.4 Export Volume and Value of Blueberries (2024)

item	Output volume	Export amount	Export-focused countries
Fresh	6,023 t	\$27,858,851	Netherlands (31%), Poland (27%), Georgia (10%), United Kingdom (7%), Spain (7%), Moldova (7%), Germany (6%)
Frozen	N/A	N/A	No proper HS code exists

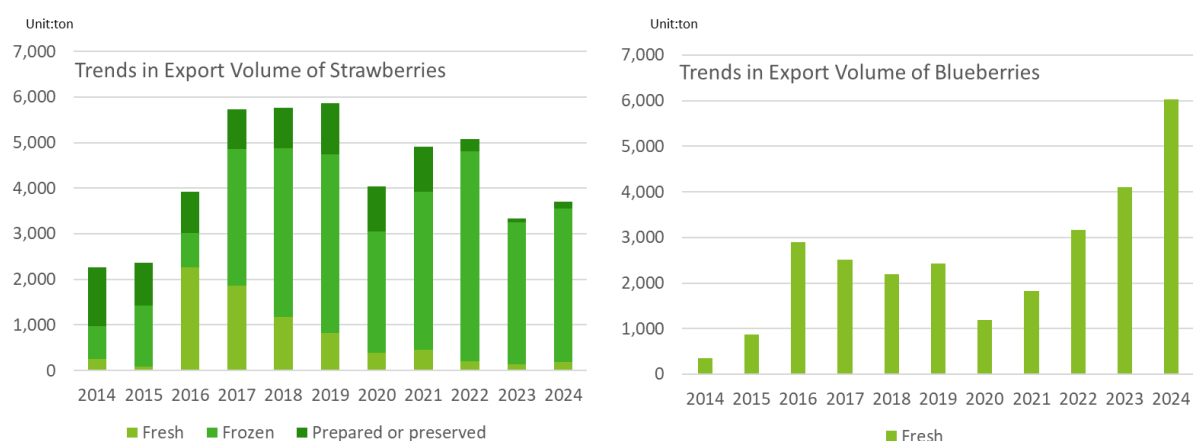
Source: JICA survey team based on WITS

(<https://wits.worldbank.org/CountryProfile/en/UKR>)

Note: Since a dedicated Harmonized System (HS) code for blueberries does not exist, the trade data utilized corresponds to the broader category of "cranberries, bilberries and other fruits of the genus Vaccinium," which includes blueberries.

⁹³ Ukrainian Agriculture Export Association, "Україна збільшила обсяги експорту свіжих і заморожених ягід у 2023 році". Ukrainian

domestic consumption. In recent years, exports of frozen fruits and berries to EU countries, led by blueberries, have increased significantly⁹⁴. Demand for blueberries as a health food is high, particularly in Germany and the UK, and is expected to continue to grow in the EU market. The trade value of fresh blueberries in the EU increased by €1.6 billion over the five years from 2018 to 2023, reaching €2.4 billion in 2023⁹⁵. According to WITS data for 2024, the average import price for Ukrainian blueberries into the EU was 4.95 USD/kg, which is lower than the overall average price of 6.66 USD/kg for all fresh berry imports into the EU.



Source: JICA survey team based on WITS (<https://wits.worldbank.org/CountryProfile/en/UKR>)

Figure 3.2.4 Trends in Export Volume of Strawberries and Blueberries in Ukraine

3.3 Detailed Analysis of Value Chains by scale of producers

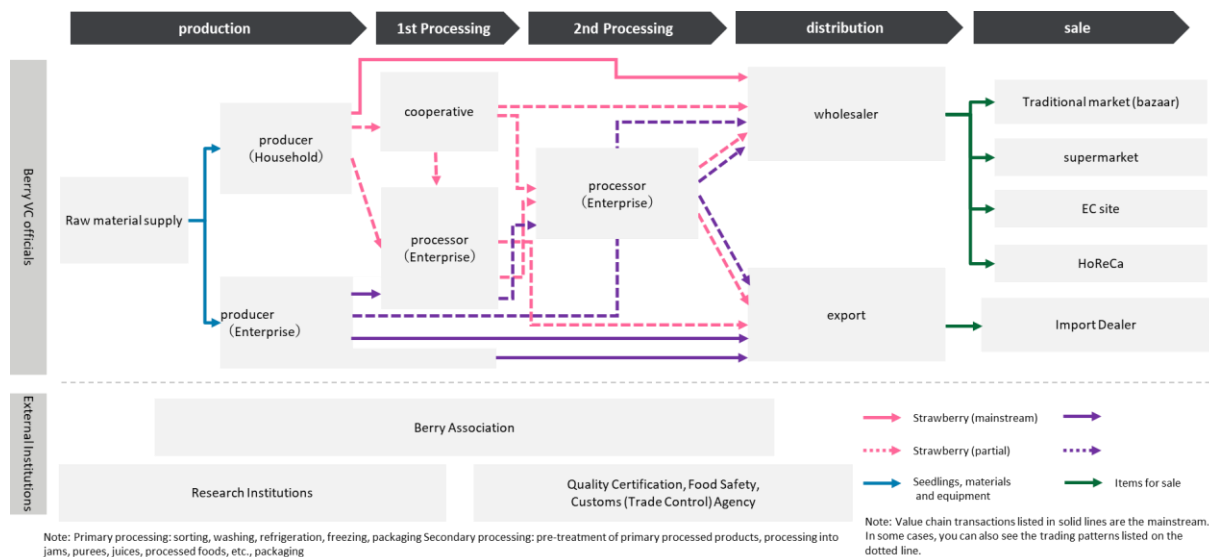
3.3.1 Value Chain Structure

As illustrated in Figure 3.3.1, the value chain structures for strawberries and blueberries in Ukraine show contrasting characteristics. Strawberries are primarily produced by "Households" and are mostly consumed domestically. In contrast, "Enterprises" dominate blueberry production, with a high proportion of their supply directed toward export markets.

Agriculture Export Association. <https://uaexport.org/2024/04/01/ukrayina-zbilshila-obsyagi-eksportu-svizhih-i-zamorozhenih-yagid-u-2023-rotsi/>, (Accessed 2025-08-28).

⁹⁴ Ukrainian Berry Association. "The Ukrainian Berry Industry 2024". <https://drive.google.com/file/d/1uK2udp-yXDNtaziavBlmwajFFNyhpFuU/view>, (Accessed 2025-08-28).

⁹⁵ Government of the Netherlands. "The European market potential for fresh blueberries". Government of the Netherlands. 2025-04-23. <https://www.cbi.eu/market-information/fresh-fruit-vegetables/blueberries/market-potential>, (Accessed 2025-08-28).



Source: JICA survey team

Figure 3.3.1 Berry Value Chain: Structure and Stakeholder Distribution

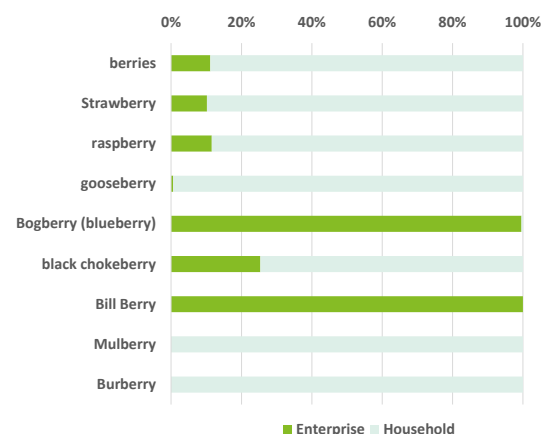
3.3.2 Producer and Processor (Primary-Processing)

The production system for berries in Ukraine is predominantly led by Households, as shown in Figure 3.3.4.

(1) Household

Strawberries are mostly produced by these Households. With a short harvest season and relatively easy cultivation management, strawberries are a suitable crop for individual farmers. Furthermore, due to their perishability, which makes long-distance transport and long-term storage challenging, they tend to be shipped as fresh produce to nearby local markets. Shipments designated for processing from households are limited, as selling the produce directly on the fresh market is more profitable. Meanwhile, the supply from enterprises for the processing industry typically consists of non-standard products or end-of-season harvests, which are traded as low-cost raw materials where quality is not a primary consideration.

Conversely, blueberry production by Households is limited, with Enterprises leading production. Blueberry cultivation requires a certain scale of initial investment for seedlings and irrigation facilities, and it takes about three to four years from planting to commercial harvesting, resulting in a longer investment recovery period. Given that most of Ukraine's blueberry production is exported to international markets, primarily the EU, it is considered difficult for Households to engage in their



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 3.3.2 Production Ratio of Berries by Production System (2023)

production and sale. However, some cases have been confirmed where Households supply and sell their blueberries to Enterprises that export frozen blueberries⁹⁶.

(2) Enterprise

Enterprises producing berries in Ukraine are mainly concentrated in the western, central-western, and central-northern regions. While there are several Enterprises engaged in large-scale blueberry production of over 100 ha, strawberry production is mainly carried out by Enterprises that practice mixed farming with other agricultural products.

Table 3.3.1 Major Berry Producers (Enterprises)

Company Name	Sales (\$)	Cultivated area (ha)			Overview and Role	Items handled		
		Total area	Strawberry	Blueberry		Strawberry	Blueberry	Other berries
Blue Berry, LLC	3.9M	120	—	120	Located 40 km from the EU border, it is export-oriented. From cultivation to primary processing (freezing)		○	
Family Garden, LLC	1.2M	155	—	155	As a farm specializing in blueberries, we carry out everything from cultivation to primary processing (freezing).		○	
Grass Avenue, FE	0.3M	100	—	100	As a farm specializing in blueberries, we carry out everything from cultivation to primary processing (freezing).		○	
Nikdaria, LLC	1.2M	160	—	145	This farm focuses on blueberries, from cultivation to primary processing (freezing).		○	○
Orniberry LLC	0.1M	100	—	100	As a farm specializing in blueberries, we carry out everything from cultivation to primary processing (freezing).		○	
Betec LTD	15.2M	550	—	550	As a farm specializing in berries, it engages in everything from cultivation to primary processing (freezing), primarily supplying to the EU and UK.		○	
Agro Organic, LLC *1	N/A	150	38	7	Farms with strawberries, blueberries, raspberries and sea buckthorn	○	○	○
Highberry, LLC *1	N/A	417	41	—	Mainly exported to the EU, from the cultivation of vegetables and fruits to primary processing (freezing)	○		○

Source: JICA survey team base on the "2024 Catalogue of Ukrainian Export-Oriented Companies" by UBA (<https://uaberries.com/en/library/catalogs>) and the "Our Members" list from UBGA (<https://www.blueberry.org.ua/members>). The table shows companies selected for having a blueberry cultivation area of 100 ha or more. Data on sales/revenue, cultivation area, and product lines were supplemented with information from D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>).

*1: Included as a major strawberry producer listed in the UBA catalogue, despite having a blueberry cultivation area of less than 100 ha.

Enterprises involved in the production and primary processing of strawberries and blueberries can be broadly categorized into four main types. The first type consists of Enterprises that produce berries on their own farms and sell them fresh. The second type includes those that, in addition to their own production, have freezing facilities and handle both fresh and frozen berries. The third type comprises Enterprises that procure berries from farmers for freezing. The fourth type consists of Enterprises that perform secondary processing of fresh and frozen berries (discussed later).

⁹⁶ Frozen processing enterprises such as Yarofruit (<https://yarofruit.com/>), ATLAS (<https://atlas-export.com/>), etc.



Figure 3.3.3 Strawberry Production and Processing Enterprises (Examples)

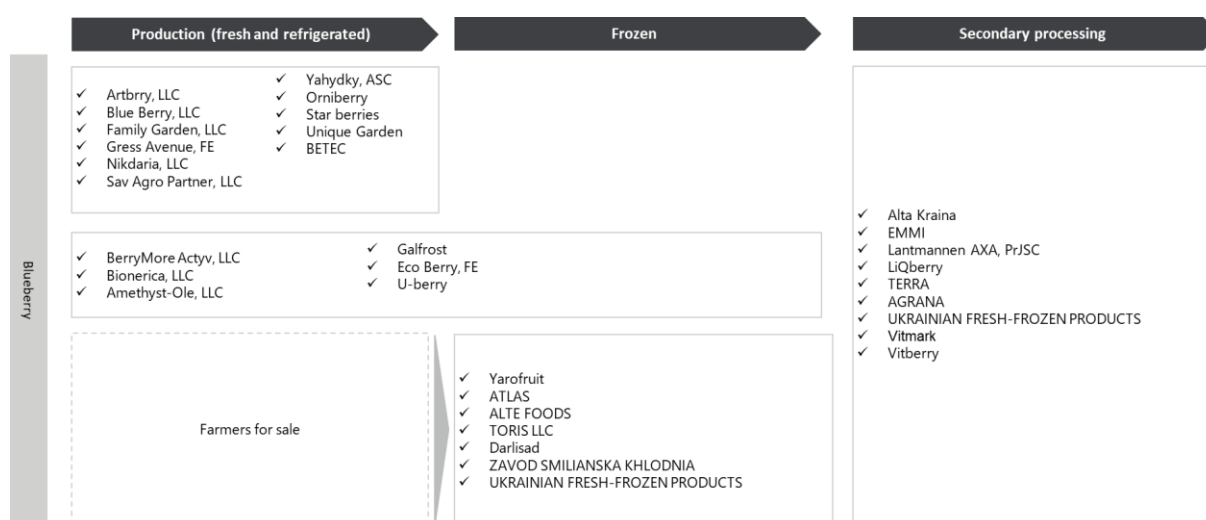


Figure 3.3.4 Blueberry Production and Processing Enterprises (Examples)

(3) Agricultural Cooperative

Despite the fact that berry production in Ukraine is dominated by Households (with the exception of blueberries, which are mainly produced by Enterprises), organized production and sales through cooperatives are limited. Although a legal framework for cooperatives exists, very few have been established for berry producers⁹⁷. As a result, the country's berry production sector lacks benefits such as organized financing, joint collection and shipping, and shared use of storage and freezing facilities. A case was reported where a project supported by DANONE in 2013 to establish a strawberry

⁹⁷ East Fruit. "Blueberries cheaper than raspberries and more bad news for blueberry growers from Ukraine". East Fruit. 2021-05-29. <https://east-fruit.com/en/news/blueberries-cheaper-than-raspberries-this-season-and-more-bad-news-for-blueberry-producers-in-ukraine/>. (Accessed 2025-08-28).

cooperative yielded positive outcomes, including local job creation, improved cultivation techniques for farmers, and stable livelihoods⁹⁸. From this, it is presumed that a certain number of producer organizations, such as cooperatives for strawberries, do exist. For blueberries, on the other hand, the country's first producer cooperative was established in 2020⁹⁹, but the number of such organizations is believed to be small at present.

Table 3.3.2 Major Berry Cooperatives

Strawberry		
cooperative	Overview and Role	location
Agricultural Production Cooperative "Zlagoda"	Mainly the cultivation of cereals, land freight transportation, wholesale of fruits and vegetables, and other types of retail in non-specialty stores	Southwestern (Chernivtsi Oblast)
Agricultural Production Cooperative "Krasnorichensky"	Mainly cultivating cereals, pomegranates, berries, and engaging in auxiliary activities for crop production and land freight transportation.	Eastern (Luhansk Oblast)
Blueberry		
Cooperatives/Affiliated Organizations	Overview and Role	location
PAT Big Berry Coop	Ukraine's first blueberry growers' cooperative established in 2020. Jointly operate refrigeration, sorting, packaging, temporary storage, and shipping facilities to secure a cold chain. Maintain stable export contracts.	Composed of 3 plantations in different states (Ivano = Frankivsk Oblast, Kyiv Oblast, Zhytomyr Oblast)
UA GROWERS OU	An integrated marketing collaboration organization for export by an Estonian (export base) corporation. More than 11 farms (more than 700 ha) are members, mainly iBerry (NIKDARIA). The organization is CoC, and several of the farms have obtained G.A.P., organic, SMETA, etc.	Estonia (Export Base)

Source: JICA survey team base on desk research, including Toripoli (<https://tripoli.land/ua/farmers/ovoshchevody/proizvoditeli-pomidorov>) etc.

3.3.3 Processor (Secondary-Processing)

In Ukraine's fruit and berry processing industry, simple processing such as producing frozen products and juice concentrates is carried out even by small and medium-sized Enterprises (SMEs). However, only a very few companies possess the scale and technical capacity to produce high-quality export-grade products like aseptic berry items. The production of berry preparations such as fillings, jams, purées, and mixes are even more limited and is mainly confined to large-scale Enterprises¹⁰⁰.

Processed retail products, such as jams, require significant investment and effort in marketing and branding. Consequently, these items are reportedly not found on retail shelves even in neighboring Poland. Furthermore, interviews with business operators have indicated that there is limited interest in exporting such secondary processed goods.

⁹⁸ Danone. "Strawberry Cooperative". Danone. <https://danone.ua/social/better-life/agro/cooperative/?L=1>, (Accessed 2025-08-28).

⁹⁹ EU4Business. "The power of three: Ukrainian blueberry growers go co-op". EU4Business. 2020.11.20. <https://eu4business.org.ua/en/success-stories/the-power-of-three-ukrainian-blueberry-growers-go-co-op/>, (Accessed 2025-08-28).

¹⁰⁰ UNIDO. Action Plans for the Green Recovery and Transformation Of the Ukrainian Food Industries. 2025-03. <https://www.unido.org/sites/default/files/unido-publications/2025-01/Action-Plans-for-Green-Recovery-and-Transformation-of-Ukrainian-Food-Industries.pdf>, (Accessed 2025-08-28).

Table 3.3.3 Major Berry Processors (Secondary Processing)

Company Name	Sales (\$)	Overview and Role	Items handled			Head office
			Strawberry	Blueberry	Other berries	
Alta Kraina	4.9M*1	It handles vegetables, fruits, and mushrooms in general, and processes juices, purees, freezing, drying, etc. Major exporters also deal with distribution.	○	○	○	Slovakia
Lantmannen AXA, PrJSC	20.9M	Headquartered in Sweden, it processes berries into cereal products	○	○	○	Sweden
Vitmark	86.7M	The company mainly produces vegetable and fruit juices, plant-based milk, infant food, functional beverages, and iced tea.	○	○	○	Ukraine
RUD JSC	84.1M	While focusing on ice cream, he handles a wide range of products such as frozen vegetables and fruits, dairy products such as butter, and frozen pastries.	○	○	○	Ukraine
Fita Trade LLC	1.6M	It produces canned vegetables and fruits, juices, tomato sauces such as ketchup, jams, jellies, etc.	○	○	○	Ukraine
UFP LLC	1.2M	It handles fresh, frozen, and secondary processed berries. Secondary processed products include purees, juices, and dried fruits.	○	○	○	Ukraine
LiQberry	0.04M	Produces berry paste	○	○	○	Ukraine

Source: JICA survey team base on "2024 Catalogue of Ukrainian Export-Oriented Companies" by the UBA (<https://uaberries.com/en/library/catalogs>) and data from D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>).

*1: Represents consolidated revenue, including sales generated outside of Ukraine.

3.3.4 Input Suppliers

(1) Seedlings

The supply of strawberry and blueberry seedlings in Ukraine involves both domestic production and imports from international companies. The supply chain differs by crop; blueberries are mainly supplied by specialized companies, whereas strawberries are thought to be propagated by farmers themselves or supplied within local communities. In recent years, a variety of cultivars for both crops have been utilized, with a growing trend toward introducing early and late-maturing varieties that can be shipped during the market's off-season.

Table 3.3.4 Major Berry Nurseries

Company Name	Head Office	Overview and Role	Products	
			Strawberry seedlings	Blueberry seedlings
Fruitech (ФруТек)	Ukraine	Companies that produce and supply seedlings in Ukraine	○	○
Fruktovyy sad AT	Ukraine	As a berry seedling nursery in Ukraine, it provides up to 600,000 seedlings per year, including virus-free blueberry seedlings and blackberries.		○
Dolina-Agro (Долина-Агро)	Ukraine	A nursery that produces and sells disease-free seedlings using the in vitro (aseptic culture) method, mainly blueberry seedlings		○
Berry Farm Ukraine	Ukraine	A large-scale nursery that handles seedlings of various plants including blueberries. We use the in vitro method to remove viruses from plants and deliver virus-free seedlings nationwide.		○
Lohyna	Ukraine	A local farm that handles both blueberries and garden strawberries for seedling and fruit production.	○	○
Farmer.ua	Ukraine	Mass production of disease-free seedlings using the in vitro method. Providing high-quality seedlings through micro-clonal propagation and establishing a production system of 10 million seedlings.		○
Institute of Horticulture of the National Academy of Agrarian Sciences of Ukraine	Ukraine	The National Institute of Horticulture of Ukraine conducts research and development of fruits and berries and produces seedlings adapted to Ukraine.		○
Fall Creek Farm & Nursery	America	It is a world-leading company in blueberry seedlings and supplies seedlings to Ukrainian producers.		○
Ekland Marketing Company, Inc. (EMCO CAL)	America	An international breeding and distribution company based in the United States that supplies high-quality berry seedlings worldwide	○	○

Source: JICA survey team base on respective company websites. Fruitech (<https://www.ft.ua/en>), Fruktovyy sad AT (<https://fruitsad.com.ua/en/>), Dolina-Agro (<https://dolina-agro.co.il/>), Berry Farm Ukraine (<https://berry-farm.com/index.php/en>), Lohyna (<https://lohyana.com/>)

(2) Agricultural equipment and inputs

For berry production, both imported and domestically produced agricultural machinery, equipment, and inputs are used. Managing climate change risks and pests is a critical challenge, and for blueberry cultivation in particular, measures against frost damage and the use of peat moss and irrigation systems to maintain soil acidity are essential for ensuring quality and yield. However, recent increases in fuel and energy prices have driven up the procurement costs of these materials, contributing to an overall rise in production costs.

Table 3.3.5 Major Suppliers of Agricultural Inputs, Machinery, and Equipment for Berry Production

Company Name	Head Office	Overview and Role	Products
Bayer Crop Science	Germany	Sales and supply of fertilizers, pesticides (crop protection products) and agricultural seeds in Ukraine	Fertilizers and pesticides
Syngenta	Switzerland	One of the world's leading agrochemical and seed companies. Supplying pesticides and seeds, supporting production, and providing technology in Ukraine.	Fertilizers and pesticides
YARA International	Norway	A leading global fertilizer and phytonutrient company supplying fertilizers to Ukraine	Fertilizers and pesticides
Timac Agro Ukraine	France	A major manufacturer of mineral fertilizers and soil amendments. Supply of fertilizer products for orchards and berry cultivation. Contributes to improving soil nutrition for strawberries and blueberries.	fertilizer
ORGANIC-GROUP	Ukraine	A major domestic manufacturer of organic fertilizers and agricultural materials. Provides sustainable agricultural materials for fertilizer and soil improvement for berry cultivation.	fertilizer
Sumykhimprom	Ukraine	Manufacture and sale of chemical fertilizers and agricultural materials. Involved in berry cultivation through fertilizer supply.	fertilizer
Agromix	Ukraine	General agricultural trading company. Sales and import of fertilizers, pesticides, materials and equipment. Handles agricultural materials for fruit trees and berries.	fertilizer
Ukravit	Ukraine	Pesticide and fertilizer manufacturer. Development and supply of products for fruit trees and berries.	pesticide
Rivulis	Israel	A global brand of irrigation equipment. Provides a high-efficiency irrigation system and contributes to the efficiency of water management for berries.	Irrigation equipment
Xylem Ukraine	United States / Ukraine	Provide water management and pumping technology. Important for irrigation and drainage systems in berry cultivation.	Irrigation equipment
Variant Irrigation	Ukraine	Irrigation system and equipment manufacturer. Contributes to water management in berry cultivation.	Irrigation equipment
Fregat	Ukraine	Agricultural machinery and material sales. We handle materials and equipment for growing fruit trees and berries.	Irrigation equipment
Peat Ukraine LLC	Ukraine	Peat products manufacturer. Provides essential materials for berry cultivation as a culture soil.	Soil, substrate, peat

Source: JICA survey team base on respective company websites. Bayer Crop Science (<https://www.cropscience.bayer.ua/>), Syngenta (<https://www.syngenta.ua/>), YARA international (<https://www.yara.ua/>), Timac Agro Ukraine (<https://ua.timacagro.com/>), ORGANIC-GROUP (<https://organicgroupukraine.com/en/>), Agromix (<https://agromix.ua/>), Ukravit (<https://www.ukravit.ua/>), Variant Irrigation (<https://variant-ir.com/>)

3.3.5 Wholesalers and Retailers

The distribution and sales channels for berries in Ukraine, like those for vegetables, consist of local markets, supermarkets, and online platforms. Strawberries, which are predominantly grown by small-scale farmers, are mainly shipped to local markets (bazaars) across the country. In contrast, while some blueberries are distributed domestically, the majority are exported. They are sold to the EU market, including Poland, via wholesale markets and other channels.

3.3.6 Other Stakeholders related to Berries

(1) Berry Association

1) Ukrainian Berries Association (UBA)

The Ukrainian Berries Association (UBA) is an organization with about 70 member Enterprises from

the domestic berry production sector. Its primary objective is to promote the export of Ukrainian berries and fruits. To achieve this, UBA supports a high-quality production environment that meets international standards by providing technical guidance on cultivation, industry analysis, and organizing events. It also conducts lobbying activities with government agencies and organizes study tours for its members.

2) Ukrainian Blueberry Growers Association (UBGA)

The Ukrainian Blueberry Growers Association (UBGA) aims to improve quality and expand exports by fostering collaboration among blueberry producers. Its main activities include technical support for production, export development, information dissemination, and conducting training programs on specialized knowledge. It has 38 member companies, nine of which are also members of UBA. The total cultivation area of its members accounts for approximately 30% of the total blueberry cultivation area in the country.

(2) Research Institutions

1) National Academy of Agrarian Sciences of Ukraine (NAAS) / NAAS Horticultural Research Institute

The National Academy of Agrarian Sciences of Ukraine (NAAS), established in 1931, is a state institution aiming to achieve sustainable agriculture through research in agricultural science and technology. Its subsidiary, the NAAS Institute of Horticulture, specializes in fruits and berries, focusing on variety breeding, research on environmental adaptability, propagation techniques, and market economy analysis. It also provides consulting services based on scientific knowledge and conducts biological evaluations of pesticides.

2) Agricultural University

Major agricultural universities in Ukraine, such as the National University of Life and Environmental Sciences of Ukraine and Lviv National Agrarian University, are key players in the research and development of berries and fruits. These universities conduct variety improvement, develop cultivation techniques, and carry out research tailored to the specific characteristics of each region. Lviv National Agrarian University, in particular, provides technical support and educational activities for the development of orchards and berry cultivation in western Ukraine.

Agricultural universities play a key role in training agronomists. The Government of Ukraine also promotes the development of agronomists and has decided to increase the number of state-funded places for Bachelor's and Master's programs in agricultural specializations by 10% in 2025 compared to the previous year¹⁰¹. However, the training of agronomists with expertise in horticulture, particularly in the berry sector, remains inadequate. As shown in the table below, the training of agronomists for the berry sector is limited to a few institutions, namely Mykolayiv National Agrarian University, the National

¹⁰¹ SuperAgronom.com. “В Україні на понад 10% зросте державне замовлення з підготовки фахівців для аграрної галузі” 2025.05.30. <https://superagronom.com/news/20826-v-ukrayini-na-ponad-10-zroste-derjavne-zamovlennya-z-pidgotovki-fahivtsiv-dlya-agramoyi-galuzi>, (Accessed 2026-01-09).

University of Life and Environmental Sciences of Ukraine (NUBiP), and the aforementioned Lviv National Agrarian University.

Table 3.3.6 Major Institutions for Training Agronomist

Institution Name	General Agriculture	Horticulture	Berries	External Training	Overview
Mykolaiv National Agrarian University	○	○	○	○	Department of Viticulture and Horticulture conducts research on berries and trains agronomists. In addition to bachelor's and master's programs, it also includes agricultural vocational schools and external training institutions.
National University of Life and Environmental Sciences of Ukraine (NUBiP)	○	○	○		Professor V.L. Symyrenko Department of Horticulture trains agronomists.
Lviv National Agrarian University	○	○	○		Department of Horticulture and Vegetable Growing trains agronomists
Odessa State Agrarian University	○	○			Multiple agriculture-related faculties train agronomists
Lutsk National Technical University	○				Department of Agronomy trains agronomists
Poltava State Agrarian Academy	○				Educational and Scientific Institute of Agricultural Technologies, Breeding and Ecology trains agronomists
Ukrainian agrarian university	○				Trains agronomists specializing in grains.

Note : ○ is listed on each institution's official website or other public sources

Source: JICA survey team base on respective organization websites. Mykolaiv National Agrarian University (<https://www.mnau.edu.ua/>), NUBiP (<https://nubip.edu.ua/en>), Lviv National Agrarian University (<https://lnau.lviv.ua/>), Odessa State Agrarian University (<https://osau.edu.ua/en/>), Poltava State Agrarian Academy (<https://www.pdau.edu.ua/>), Ukrainian Agrarian University (<https://uau.org.ua/en>)

(3) Certification Body

In recent years, berry exports, particularly of blueberries, have been increasing. Exporting berries often requires obtaining certifications such as GLOBALG.A.P. or organic certification (EU or USDA), depending on the buyer. An increasing number of companies, mainly the major Enterprises in production and primary processing, are obtaining international certifications to meet export requirements. GLOBALG.A.P. is a comprehensive international standard for agricultural production covering food safety, environmental protection, and labor safety. Its requirements include soil and water analysis, proper pesticide management, record-keeping, and ensuring traceability. In Ukraine, three companies, including Control Union Certifications Ukraine LLC and RINA Services S.p.A., handle certification services. While both individual (Option 1) and group (Option 2) certification options exist, obtaining them is difficult for small-scale producers due to costs and administrative burdens. On the other hand, organic certification is legally required for exporting organic products to markets like the EU. This certification demands the non-use of synthetic chemical pesticides and fertilizers, maintenance of an organic management ledger, and annual audits by a certification body. In Ukraine, Organic Standard LLC. and others manage this certification. Although Ukraine has its own national organic certification system, it lacks international recognition, so businesses that export currently need to obtain separate EU or USDA organic certification.

3.4 Challenges and Opportunities

3.4.1 Challenges and Opportunities in the Strawberry Value Chain

Since strawberries produced in Ukraine are primarily distributed in domestic local markets, enhancing their value chain hinges on developing high-value-added products oriented toward the domestic market.

This section outlines the key challenges at the production, processing, and sales stages, as well as opportunities for future development.

(1) Challenges in Production and Proposed Countermeasures

Based on the initial survey and value chain analysis, the main challenges in strawberry production and proposed countermeasures are summarized below.

	Issue	Counter Measure (short-term)	Counter Measure (medium- to long-term)
Introduction of Cultivation Methodology for High Profitability	Prices fall during periods of concentrated supply in the domestic market. Profitable cultivation management, such as adjusting shipping times through facility cultivation and the introduction of suitable varieties, is not implemented.	- Initial support for the introduction of facility cultivation (greenhouse, irrigation) - Technical guidance on cultivation schedule adjustment	- Strengthening producers' management analysis capabilities (profit maximization plan) - Establishment of a yield adjustment system based on market supply and demand
Responding to Climate Change and Extreme Weather	Open-field cultivation has a high risk of yield decline due to frost damage and temperature, but there is not enough institutionalization to address climate risks.	- Support for the dissemination of frost protection materials and simple tunnels - Development of climate information and countermeasures (SMS/app, etc.)	- Promoting the introduction of facility horticulture at the regional level - Introduction and breeding of climate-adapted varieties
Support for New Farmers Including Women	Cases of women and others newly starting strawberry cultivation, but insufficient cultivation techniques and knowledge have led to issues such as continuous cropping problems.	- Establishment of cultivation technique guidance scheme - Dissemination of cultivation technique guidance manual	Support for the development and introduction of High-Yield Varieties

Source: JICA survey team

Figure 3.4.1 Major Issues Facing Production of Strawberry and Countermeasures

1) Introduction of Cultivation Management Considering Profitability (Households/Enterprises)

Strawberry production in Ukraine is predominantly based on open-field or simple protected cultivation, leading to a concentration of supply in the market during a specific period. This creates a structural challenge where market prices fall during the harvest season, undermining farmers' profitability. A shift to full-scale protected cultivation, which allows for staggered shipping, or to more profitable varieties, is currently limited.

As a short-term measure, it would be effective to support the introduction of facilities such as greenhouses and low tunnels, while also providing technical guidance on cropping plans and cultivation systems (e.g., crop rotation, intercropping) that take profitability into account. For the medium to long term, it is essential to disseminate comprehensive technical guidance that includes business management aspects, enabling producers to make farming decisions based on cost-effectiveness analysis. Additionally, it is necessary to establish community-level mechanisms to adjust shipments based on market supply-demand data and price trends.

2) Responding to Climate Change and Extreme Weather (Households/Enterprises)

Strawberries are susceptible to temperature fluctuations and frost damage. In Ukraine, where open-field cultivation is prevalent, there is a constant risk of reduced yields and quality deterioration due to frost. Cases have been reported where even enterprises with relatively advanced countermeasures suffered production losses of as much as 70% due to frost damage. The increasing frequency of extreme weather events associated with recent climate change has exacerbated this vulnerability, yet the adoption of facilities and resistant varieties to mitigate climate risks has not progressed sufficiently.

Traditional methods against climate change and extreme weather are widely practiced, such as covering fields with non-woven agricultural fabric (agro-textiles) and smudging, which involves burning materials like straw to raise the air temperature near the ground. However, the effectiveness of these methods is limited; agro-textiles are generally effective only down to temperatures of -3°C , while smudging is less effective in windy conditions or during prolonged periods of frost¹⁰². Therefore, it is an urgent priority to enhance the resilience of production sites. This should be achieved by ensuring the thorough application of traditional countermeasures in the short term, while also supporting the introduction of technologies such as anti-frost fans and sprinkler irrigation. These efforts must be promoted through the dissemination of knowledge on climate risks and their corresponding adaptive technologies. For the medium to long term, a fundamental strengthening of resilience against frost damage and heat stress is required by promoting the transition to environmentally controlled horticulture. Furthermore, introducing and breeding varieties adapted to local climatic conditions are indispensable for building a sustainable production base.

3) Support for New Farmers Including Women (Households)

The reduction in the male labor force, a consequence of the Russian invasion, is anticipated to lead to an increase in new entrants to agriculture, particularly women. The Government of Ukraine is promoting new entries into horticulture and greenhouse farming, as well as the expansion of cultivated areas, through eRobota, thereby supporting these new farmers. On the other hand, many individual farmers face challenges due to insufficient technical knowledge and expertise, resulting in issues such as soil sickness from continuous cropping¹⁰³. Furthermore, for farming operations managed by women, there is a specific need for small-scale and lightweight agricultural machinery.

As a short-term measure, it is required to establish and disseminate a technical guidance scheme and instruction manuals targeting new entrants. In the medium to long term, further yield improvement should be pursued through support for the development and introduction of high-yield crop varieties and small-scale, lightweight agricultural machinery.

(2) Challenges in Processing and Sales and Proposed Countermeasures

The main challenges at the processing and sales stages of the strawberry VC are summarized below.

	Issue	Counter Measure (short-term)	Counter Measure (medium- to long-term)
Quality Control	Strawberries are prone to price declines due to quality deterioration. Sorting, packaging, and maintaining freshness after harvest are important, but only a limited number of producers have the equipment.	- Promoting the introduction of simple sorting and cooling equipment that can be implemented at low cost - Support and guidance for the development of post-harvest technology (packaging, cooling)	- Improvement and enhancement of quality management standards (QMS, HACCP) system - Establishment of a processing and sales system that meets high-grade standards
Access to Export Market	Export markets, especially in the EU, have limited export opportunities due to sufficient supply from production in the region.	- Test marketing of differentiated products (organic, frozen, functional) - Supporting Exhibits at International Exhibitions and Export Business Meetings	- Establishment of export schemes using international certifications - Developing a brand strategy for a specific market (Middle East and Asia)

Source: JICA survey team

¹⁰² Based on interviews with strawberry farmers

¹⁰³ Based on interviews with enterprises cultivating strawberries

Figure 3.4.2 Major Issues Facing Processing and Sales of Strawberry and Countermeasures

1) Lack of Quality Control (Mainly Enterprises)

Although strawberries are a crop that requires differentiation in high-value markets, Ukraine's post-harvest quality control systems for sorting, packaging, and freshness preservation are not well-established. This leads to quality deterioration during distribution, often resulting in lower prices and lost sales opportunities. For small-scale farmers in particular, introducing essential equipment for quality preservation, such as pre-cooling facilities and high-precision sorters, is extremely difficult due to cost constraints.

As a short-term measure, it is effective to support the dissemination of low-cost sorting and cooling technologies that contribute to quality preservation, and to conduct technical training on improving post-harvest management, including proper packaging and transportation methods. In the medium to long term, it is necessary to build a shipping system that can meet the standards required by export and high-end domestic markets by supporting the introduction and implementation of international management methods like Quality Management Systems (QMS) and Hazard Analysis and Critical Control Points (HACCP).

2) Difficulty in Accessing Export Markets (Mainly Enterprises)

Regarding strawberry exports, the EU market, a major potential destination, is already saturated with intra-regional production. Additionally, the international brand power and market recognition of Ukrainian products have yet to be established, posing a significant barrier to export expansion. Furthermore, efforts to enhance international competitiveness, such as quality differentiation and securing diverse transportation options, are not sufficiently advanced.

As a short-term response, it is necessary to conduct test marketing with high-value-added products—for instance, through organic certification, frozen processing, functional enhancements, or adjusted shipping periods—to explore export channels. In the medium to long term, it is important to reflect the results of such efforts in strengthening the domestic production and supply system, while also formulating an export strategy targeting promising markets outside the EU (e.g., the Middle East, Asia) and developing products and promotions tailored to the characteristics of those markets.

(3) Opportunities in the Strawberry Value Chain

Based on the preceding analysis, the opportunities in Ukraine's strawberry value chain are considered below.

1) Expansion of Agricultural Participation by Women and Families

The cultivation and harvesting of horticultural crops, such as strawberries, are relatively light labor, the crop is well-suited for small-scale family farming and has characteristics that make it particularly easy for women to participate actively. Therefore, promoting strawberry production can be seen as a

significant opportunity not only to create new employment in rural areas but also to foster women's economic independence and contribute to the advancement of gender equality.

2) Market Diversification through Shipment Time Disperse and Quality Management

Current strawberry cultivation is characterized by low unit yields and a concentrated harvest period, which results in low market prices for farmers. Profitability is expected to improve by staggering the shipping periods, which can be achieved through the introduction of protected horticulture, including greenhouse cultivation. Furthermore, implementing enhanced post-harvest quality management, such as the installation of pre-cooling facilities at production sites, can enable diversification of market outlets beyond local areas. In the long term, if these measures are effectively implemented, accessing export markets could become a viable prospect.

3.4.2 Challenges and Opportunities in the Blueberry Value Chain

Blueberry production in Ukraine is expanding, primarily targeting export markets, with a focus on the EU. Therefore, strengthening the blueberry value chain critically depends on establishing an export supply system that meets the standards of the international market. This section outlines the key challenges at the production, processing, and sales stages, as well as future opportunities.

(1) Challenges in Production and Proposed Countermeasures

Based on the initial survey and value chain analysis, the main challenges in blueberry production and proposed countermeasures are summarized below. Challenges in the production aspect can be broadly categorized into two main areas: yield improvement and enhancement of high value-addition.

		Issue	Counter Measure (short-term)	Counter Measure (medium- to long-term)
Yield Improvement	Improvement of Cultivation Techniques	- There are many immature fields, and improving productivity through appropriate soil and moisture - Even in enterprises with large-scale farms, there are very few skilled agronomists or technicians with specialized knowledge of blueberries.	- Implementation of the cultivation technology guidance schemes - Dissemination of cultivation technique guidance manuals - Training of berry-specialized agronomists in collaboration with universities	Support for the development and introduction of high-yield varieties
	Investment in Facilities to respond to Climate Risks	It is also important to respond to climate risks such as frost damage and high temperature damage.	Frost protection, irrigation, and mulch introduction support	Development of a climate risk insurance system
	Securing Seasonal Workers	Intensive labor is required, mainly during the harvest season, but securing seasonal workers is an issue due to migration and conscription.	Employment matching for veterans and immigrants	Improvement of worker mediation function
High Value-Addition	Introduction of Post-Harvest Processing Equipment	- Lack of post-harvest processing equipment (fruits sorting, packaging, pre-cooling) at the production site. - It is especially important to cool blueberries to 2-4°C within 30 minutes after harvest.	- Support for the introduction of small-scale pre-cooling units and fruit sorting lines - Promoting the joint use of existing equipment	- Development of regional cold chain bases (collection and shipping sites) - Establishment of a joint logistics and export cooperation model
	Obtaining and Maintaining International Certifications	- In terms of cost and management, it is difficult to obtain and maintain international certifications such as Global G.A.P and organic certification. - Challenges in quality and safety management of exported crops.	- Quality control and records management training - introduction of a subsidy system for obtaining and maintaining certification	- Introduction of a support system for obtaining group certification - Promoting the alignment of domestic systems with international standards

Source: JICA survey team

Figure 3.4.3 Major Issues Facing Production of Blueberry and Countermeasures

1) Improvement of Cultivation Techniques (Enterprises/Households)

Although commercial blueberry cultivation is rapidly expanding in Ukraine, many plantations are still young, and the dissemination of cultivation techniques, such as proper soil and water management,

has not kept pace. If cultivation management does not adequately match the expansion of production area, there is a concern that productivity will be unstable, leading to variations in yield and quality. Moreover, in some cases, even in enterprises with large-scale farms, there are very few skilled agronomists or technicians with specialized knowledge of blueberries. This situation acts as a significant impediment to the improvement of their production technology.

As a short-term measure, it is effective to stabilize the production base by strengthening on-site technical guidance for cultivation and supporting the introduction of irrigation systems, and mulching materials. Furthermore, collaboration with universities to foster agronomists specializing in berry is also crucial. In the medium to long term, in addition to promoting the introduction of superior varieties with high yields, the creation and dissemination of standardized cultivation manuals are essential.

2) Investment in Facilities to Respond to Climate Risks (Enterprises/Households)

Climatic risks, including frost damage and high temperature damage, are significant factors causing instability in harvest volumes. For instance, there have been reported cases where even well-funded enterprises with relatively advanced countermeasures sustained production losses of 60% due to frost damage in 2023, and another severe case resulted in a 90% loss in 2025. Although traditional methods like those described in Section 3.4.1 for strawberries (e.g., mulching and smudging) are applied, their effectiveness is limited to a certain temperature threshold, making this a very serious problem. Capital investment in solutions such as frost protection fans and protected cultivation systems is considered a necessary step. However, some enterprises exploring these options face challenges in securing financing, which impedes progress.

As a short-term measure, support for the introduction of frost protection fans and protected cultivation systems is required. It is also important to promote the adoption of superior, climate-resilient crop varieties. In the medium to long term, establishing agricultural insurance systems should also be pursued to mitigate financial losses stemming from climate-related events.

3) Securing Seasonal Workers (Enterprises/Households)

Blueberries are a labor-intensive crop that requires manual harvesting to maintain quality, necessitating a large, short-term workforce during the harvest season. According to the interviews, some enterprises required as many as 10 seasonal workers per hectare. However, the full-scale Russian invasion and subsequent population outflow have made it increasingly difficult to secure seasonal workers each year, posing a serious challenge for producers. In the case of one enterprise, for instance, 85% of its seasonal workers during the harvest season were working during their leave from their primary jobs, a situation that is hardly indicative of a sustainable production system. Furthermore, it has been pointed out that this labor shortage is contributing to a rise in labor costs.

As short-term measures, it would be effective to support the creation of mechanisms to utilize internally displaced persons and veterans as a new labor force. In the medium to long term, it is necessary to reduce dependency on labor by developing a supply-demand matching function to ensure a stable

workforce and by promoting investment in areas where mechanization is possible, such as post-harvest sorting processes.

4) Introduction of Post-Harvest Processing Facilities (Enterprises/Households)

In Ukraine's blueberry production regions, there is still a shortage of facilities for sorting, packaging, and pre-cooling, which are essential for maintaining post-harvest quality. This leads to quality deterioration during transportation and significantly undermines the commercial value of fresh blueberries. In particular, it is crucial to cool the berries to a temperature of 2-4° C within 30 minutes of harvesting. This requirement underscores the critical importance of establishing adequate refrigeration facilities in the vicinity of the production areas. In addition, the lack of an established cold chain—a consistent low-temperature management system from the production area to the final consumer, which is indispensable for exports—makes it difficult to meet the strict quality standards required by markets such as the EU.

In the short term, it would be effective to support the dissemination of small-scale cooling equipment and sorting lines that individual producers can introduce. In the medium to long term, it is required to establish a cold chain throughout the entire value chain. This should be achieved by developing a joint logistics system centered on large-scale, shared collection, shipping, and pre-cooling facilities, with support provided to large-scale enterprises for their construction at strategic locations. Strengthening this infrastructure is indispensable for consistently meeting the high-quality standards demanded by export destinations and will dramatically enhance the international competitiveness of Ukrainian blueberries.

5) Obtaining and Maintaining International Certifications (Mainly Enterprises)

Blueberry production is expanding with a primary focus on exports, which requires obtaining international certifications such as Global G.A.P. and organic certification to access international markets. However, for many small and medium-sized producers, the financial and administrative burdens of obtaining and maintaining these certifications are significant, limiting their widespread adoption. Although data for 2025 is not yet available, as of 2020, only 10 companies in Ukraine had obtained GLOBALG.A.P. certification¹⁰⁴. In addition, institutional challenges have been pointed out, such as the reliability of the domestic audit system and the inconsistency between the national organic certification system and international standards, which further complicate producers' ability to comply with international market requirements. Moreover, the previously mentioned shortage of agronomists also impedes the acquisition of international certifications, as obtaining GLOBALG.A.P. certification requires regular field inspections by such specialists.

In the short term, it is effective to enhance producer capacity by providing practical training on record-keeping and quality control methods required for certification, while also introducing subsidy programs

¹⁰⁴ EAST FRUIT, In Ukraine, more and more blueberry producers receive GLOBALG.A.P certification, EastFruit (Retrieved January 7, 2026)

to reduce the cost burden of obtaining certification. In the medium to long term, it is necessary to reduce the individual burden by promoting a "group certification" system, where multiple producers obtain certification jointly. Furthermore, it is essential to create an environment where producers can sustainably maintain their certifications by advancing policy support to align domestic certification systems with international standards.

(2) Challenges in Processing and Sales and Proposed Countermeasures

The main challenges at the processing and sales stages of the blueberry value chain are summarized below.

	Issue	Counter Measure (short-term)	Counter Measure (medium- to long-term)
Expansion of Export Sales Channels	- Participation in exhibition is essential for developing new business partners, but the cost of expanding sales channels is high. - Limited number of companies with international certifications and export support - With the increase in cultivated area, securing sales destinations for blueberries, which are expected to increase in production, is a challenge.	- Support for scale expansion of export companies and support for new entrants - Creation of opportunities for business negotiations and expansion	- Establishment of a support scheme for the development of export-ready companies - Establishment and strengthening of joint shipping and organized export systems
Strengthening Competitiveness other than Price	- The unit price of export of Ukrainian blueberries is low. While there is not much advantage in timing, it is characterized by high price competitiveness. - Strengthening competitiveness beyond price is a challenge to address the high costs due to soaring energy and fuel prices.	- Guidance on the establishment and compliance of quality standards - Support for authentication and traceability display	- Brand building support (e.g., geographical indications) - Differentiation support using organic and functional labels, etc.

Source: JICA survey team

Figure 3.4.4 Major Issues Facing Processing and Sales of Blueberry and Countermeasures

1) Expansion of export sales channels (Mainly Enterprises)

Enterprises utilize methods such as participating in exhibitions to cultivate new clients. However, diversifying their sales channels requires them to attend numerous exhibitions, which incurs significant costs. Only a very small number of producers and processors have obtained the advanced food safety standards essential for international market access, such as Global G.A.P., organic certification, BRCGS, or FSSC 22000. Furthermore, the number of exporters with Global G.A.P. Chain of Custody (CoC) certification, which guarantees control over the distribution process, is also limited. While production volume is expected to increase with the expansion of cultivation area, a key challenge is the lack of sufficiently secured, stable export channels to absorb this increase, highlighting the need to develop the supply system.

In the short term, potential countermeasures could include providing support for participation in exhibitions and facilitating business matchmaking with buyers. It is effective to support and promote the business expansion of progressive companies that have already obtained international certification. Concurrently, for ambitious new businesses aiming for certification, it is important to provide individual coaching from experts and create matching opportunities with overseas buyers to establish success stories and present concrete models for the export business domestically. In the medium to long term, based on these successes, it is necessary to develop and deploy a support program to systematically nurture businesses with export potential. Furthermore, by strengthening joint shipping and export

systems, it is necessary to develop an inclusive export platform that allows even SMEs, which may struggle to compete on their own, to access international markets.

2) Strengthening Competitiveness Beyond Price (Mainly Enterprises)

The export unit price of Ukrainian blueberries is lower than that of major competing countries, and its competitiveness relies heavily on this price advantage. However, this structure is extremely fragile, as its foundation is being undermined by rising production costs due to recent increases in energy and packaging material prices. Meanwhile, in major import markets like Europe, non-price factors such as quality consistency, traceability that ensures transparency of production history, and trust in the product brand are becoming important criteria in purchasing decisions. Therefore, to achieve sustainable export growth, the challenge is to move away from price competition and establish a competitive advantage based on added value.

As a short-term measure, it is essential to first build a foundation of trust in the quality and safety of "Ukrainian products" as a whole. To this end, it is necessary to establish and enforce unified domestic quality standards, promote the acquisition of international certifications and the introduction of traceability systems, and create a system that can objectively prove quality and safety. In the medium to long term, a more advanced differentiation strategy of building original brands should be promoted. Specifically, by registering and utilizing "Geographical Indications (GI)" that leverage the climatic and soil characteristics of specific regions, a unique story and identity can be attributed to the product, clearly differentiating it from those of other countries. In addition, by highlighting value-added features like "organic cultivation" or "containment of specific functional components" and appealing to health-conscious consumer segments, a marketing strategy should be deployed to visualize and effectively communicate the product's value. Through these efforts, a shift from the highly price-competitive commodity market to a higher-profitability, high-value-added market is required.

(3) Opportunities in the Blueberry Value Chain

Based on the preceding analysis, the opportunities in Ukraine's blueberry value chain are considered below.

1) Expansion of Export Opportunities in Emerging Markets

In addition to the EU market, consumer demand for blueberries is growing steadily in the Middle East and Southeast Asian countries (especially China, Thailand, and Vietnam), driven by economic growth, an expanding middle class, and rising health consciousness. Under these circumstances, Ukrainian blueberries are gaining international recognition due to their price competitiveness and a solid track record of exports built in recent years. Therefore, these emerging markets represent highly promising opportunities for export expansion, not only for fresh products but also for frozen ones.

2) Differentiation in High-Value-Added Markets

In mature markets, particularly in Europe, there is a strong, distinct demand for organic products and

goods that promote health benefits. Blueberries are highly compatible with these market characteristics. By obtaining organic certification that complies with international standards, it is possible to clearly differentiate them from conventional products. This represents a highly effective strategic opportunity to move beyond mere price competition and to develop a high-value-added niche market targeting consumers with a strong awareness of health and the environment.

3.4.3 Identification of Priority Issues

From the issues described in Sections 3.4.1 and 3.4.2, priority issues are identified based on their degree of urgency and scope of impact.

1) Identification of Priority Issues in the Strawberry Value Chain

In Figure 3.4.5, the issues are organized by urgency and impact, each assessed on a three-tier scale: dark green indicates the highest level, light green high, and white low. A scoring system was applied where the highest level received two points and the high level one point. Issues with a total score of three or more were deemed top priority issues, while those with a score of two were considered high priority issues. As a result, ① Cultivation management for profitability and ② Response to climate change and extreme weather were identified as top priority issues, with ③ Quality control was selected as high priority issues. The rationale for this selection is detailed below. For issues not prioritized, please refer to the comments in Figure 3.4.5.

Regarding ① Cultivation management for profitability, the current lack of adjustment in shipping periods is causing price declines, making it a pressing concern that was assigned the highest urgency. However, its impact was rated as high. Although some farmers have begun to introduce greenhouses and this need is observed, the high cost of capital investment is considered a significant business risk given that the most of producers are individual farmers¹⁰⁵. The impact was therefore rated as high because, even with financial support such as loans, the number of farmers capable of adopting greenhouses would likely be limited.

Regarding ② Response to climate change and extreme weather, there have been cases where even enterprises with relatively advanced countermeasures suffered production losses as high as 70% from frost damage. The insufficient response to frost damage is considered one of the reasons for Ukraine's internationally low yields, which is why its urgency was assigned the highest level. However, because basic measures like mulching and simple frost prevention are already practiced, and since more effective solutions require capital investments in greenhouses or frost protection equipment, the impact was rated as high, similar to issue ①.

Regarding ③ Quality control, the absence of post-harvest refrigeration facilities compels farmers to sell in nearby markets, contributing to lower prices. Although diversifying sales channels is important

¹⁰⁵ According to interviews with UBA, an investment of approximately 200,000 EUR per hectare is required.

for strengthening farmers' bargaining power, this issue was considered less urgent than ① and ②; thus, its urgency was rated as high. As for its impact, while some farmers express a desire for refrigeration facilities, it is believed that, similar to issues ① and ②, few would be capable of making the necessary capital investment. Therefore, the impact was also rated as high.

Issue			Target	Urgency	Scope of Impact	
Production	Support for New Farmers, Including Women	• Cases of women and others newly starting strawberry cultivation, but insufficient cultivation techniques and knowledge have led to issues such as continuous cropping problems.	Individual Farmers	There are new farmers supported by initiatives such as E-Robota, and this is an urgent issue for them	The number of new farmers is limited	
	Cultivation Management with Consideration for Profitability	• Prices fall during periods of concentrated supply in the domestic market. Profitable cultivation management, such as adjusting shipping times through facility cultivation and the introduction of suitable varieties, is not implemented.	Individual Farmers	Currently, the shipping season is hardly adjusted, making this an urgent issue	Not many farmers are able to introduce greenhouses, but some demand exists	← Top Priority
	Response to Climate Change and Extreme Weather	• Prices fall during periods of concentrated supply in the domestic market. Profitable cultivation management, such as adjusting shipping times through facility cultivation and the introduction of suitable varieties, is not implemented.	Individual Farmers	This is considered a factor in low yield per unit area, and there is significant room for improvement	Not many farmers are able to introduce greenhouses, but some demand exists	← Top Priority
Sales	Quality Control	• Strawberries are prone to price declines due to quality deterioration. Sorting, packaging, and maintaining freshness after harvest are important, but only a limited number of producers have the equipment. (Especially, Households)	Individual Farmers/Co operatives	Due to the lack of refrigeration facilities, farmers often have no choice but to sell their products immediately at nearby markets after harvest	Not many farmers are able to introduce refrigeration facilities, but some demand exists	← High Priority
	Access to Export Markets	• Export markets, especially in the EU, have limited export opportunities due to sufficient supply from production in the region.	Individual Farmers/Co operatives	Currently, almost no exports are being made, which is an urgent issue	There are many issues to overcome for export, and only a limited number of farmers are able to address them	

Source: JICA survey team

Figure 3.4.5 Priority Issues of Strawberry

2) Identification of priority Issues in the Blueberry Value Chain

From the perspectives of urgency and impact, ① Enhancement of cultivation technology and ② Capital investment for climate risk mitigation were identified as top priority issues, while ③ Expansion of export sales channels was selected as a high priority issue. The rationale for this selection is described below. For issues not prioritized, please refer to the comments in Figure 3.4.6.

① Regarding enhancement of cultivation technology, there is potential to increase yields even among enterprises, and it is observed that some producers have been unable to hire agronomists or technicians with specialized knowledge of blueberries. As stated in Section 3.1.1, Ukraine's blueberry yield is low compared to other countries, and the primary factors for this are believed to be cultivation techniques and the frost damage countermeasures discussed next. Therefore, the urgency is the highest level. The impact, on the other hand, is rated as high. This is because while households and small to medium-sized enterprises face significant challenges, large-scale enterprises have, for the most part, been able to address the situation.

② Regarding capital investment for climate risk mitigation, the urgency is also considered to be of the highest level. There are cases where even enterprises experience yield reductions of 60% to 90% due to frost damage, necessitating an immediate response. The impact is also rated as the highest since this is a widespread challenge that affects a broad spectrum of actors, from households to large-scale enterprises.

③ Regarding the obtaining and maintaining of international certifications, this is not considered a

pressing issue, given that export-oriented sales channels are already established. However, to diversify export markets, acquiring such certifications is necessary; for instance, GLOBALG.A.P is required for exporting to the EU. The objective is to seek more favorable trading conditions and to hedge risks by diversifying sales channels. Therefore, the urgency is rated as high. Regarding the impact, it is also rated as high, as it has been observed that a number of enterprises have not yet obtained GLOBALG.A.P, indicating that there is a significant potential impact.

④ Regarding expansion of export sales channels, while developing new clients is an important task, exports already represent the main sales channel, and an established client base exists. The primary objective is risk hedging, such as seeking more favorable transaction terms and diversifying sales channels; thus, its urgency is rated as high. In terms of impact, this is a critical issue not only for new entrants but also for many existing businesses that need to secure markets for their increased production, given the current growth trend. Therefore, its impact is rated as high.

		Issue	Target	Urgency	Scope of Impact	
Yield Improvement	Improvement of Cultivation Techniques	• Even in enterprises with large-scale farms, there are very few skilled agronomists or technicians with specialized knowledge of blueberries.	Enterprise/ Individual Farmers	Even enterprises still have room to increase yield per unit area, making this an urgent issue	The impact is significant, as both individual farmers and small and medium enterprises face challenges.	←Top Priority
	Investment in Facilities to Respond to Climate Risks	• Measures to address climate risks such as frost damage and heat stress are insufficient.	Enterprise/ Individual Farmers	Even enterprises have experienced cases where frost damage led to a 60% reduction in yield, which is an urgent issue	Even enterprises still have room for improvement, and the impact is significant	←Top Priority
	Securing Seasonal Workers	• Intensive labor is required, mainly during the harvest season, but securing seasonal workers is an issue due to migration and conscription.	Enterprise/ Individual Farmers	Although they are already facing a labor shortage, it appears that they have not yet reached a situation where harvesting is impossible	There are prospects for increased production in the future, making this an important issue for both enterprises and individual farmers	
High Value-Addition	Introduction of Post-Harvest Processing Equipment	• Lack of post-harvest processing equipment (fruits sorting, packaging, pre-cooling) at the production site. • It is especially important to cool blueberries to 2-4°C within 30 minutes after harvest.	Enterprise/ Individual Farmers	Existing businesses have equipment; the issue lies with new entrants and responding to increased production	This is mainly a problem for individual farmers, and the impact is limited	
	Obtaining and Maintaining International Certifications	• obtain and maintain international certifications such as Global G.A.P and organic certification. • Challenges in quality and safety management of exported crops. • International certifications are required not only for producers but also for wholesalers such as export	Enterprise/ Individual Farmers	Since they are mainly export-oriented, if they do not obtain international certification, export destinations are limited and prices are lower	Even among enterprises, there are a certain number of businesses that have not obtained Global G.A.P certification.	←High Priority
	Expansion of Export Sales Channels	• Participation in exhibition is essential for developing new business partners, but the cost of expanding sales channels is high.	Enterprise/ Exporters/ Associations	As they currently have trading partners, this is mainly for future sales or sales under better conditions	New business partners are important not only for new businesses but also for increased production	←High Priority
	Strengthening Competitiveness other than Price	• Strengthening competitiveness beyond price is a challenge to address the high costs due to soaring energy and fuel prices.	Enterprise/ Individual Farmers	Currently, they still have price competitiveness, so this remains a future issue	Only a limited number of producers can meet requirements such as organic certification and building traceability brands	

Source: JICA survey team

Figure 3.4.6 Priority Issues of Blueberry

3.5 Proposals

Based on the priority issues identified in Section 3.4.3, this section proposes potential cooperation projects for JICA to undertake.

3.5.1 Project for Strengthening Production Technology and Promoting Exports of Berry (Technical Cooperation Project)

This proposal outlines a project to support blueberry producers and related companies in Ukraine by enhancing their production technology and promoting exports to strengthen their competitiveness in the international market. Although Ukraine possesses a natural environment well-suited for blueberry production, it faces challenges such as inadequate soil and water management and insufficient responses to climate risks like frost damage.

Furthermore, there is a shortage of agronomists (specialized agricultural technicians) responsible for production management. As a result, the foundational support system enabling farmers to conduct proper cultivation management is not adequately established. In the area of export promotion, additional challenges include expanding export sales channels and obtaining and maintaining international quality certifications such as Global G.A.P and organic certification. Proper guidance from agronomists is essential to meet the quality standards required by export destinations; however, the insufficient supply of these professionals has become a critical bottleneck to export expansion.

Through this initiative, JICA will provide the following support via technical cooperation, in partnership with the Government of Ukraine. The expected components are as follows.

1) Strengthening Production Technology and Human Resource Development

- ✓ Develop and implement a specialized curriculum delivering the necessary knowledge and skills for blueberry production; to be offered through vocational schools and Agricultural Development Agency of Ukraine This aims to remedy the current shortage of specialized technicians and establish a system that enables producers to carry out proper cultivation management.
- ✓ Improve productivity and quality by strengthening technical guidance for blueberry producers and enterprises.

2) Support for Export Promotion

- ✓ In addition to enhancing production technology, provide support for acquiring international certifications such as Global G.A.P This includes offering guidance and financial support throughout the process of obtaining Global G.A.P and organic certifications required for export markets, thereby strengthening producers' competitiveness and enabling stable exports.
- ✓ Promote exports with a focus on the EU market to expand high-volume sales channels. Concurrently, support market development for blueberries targeting non-EU markets, primarily in Southeast Asia and the Middle East. The project will also address challenges related to export documentation, procedures, and logistics to increase the overall export volume of Ukrainian blueberries.

Project Purpose

The objective of this project is to resolve challenges in production technology within Ukraine's blueberry industry and to build a sustainable industrial base through the promotion of exports.

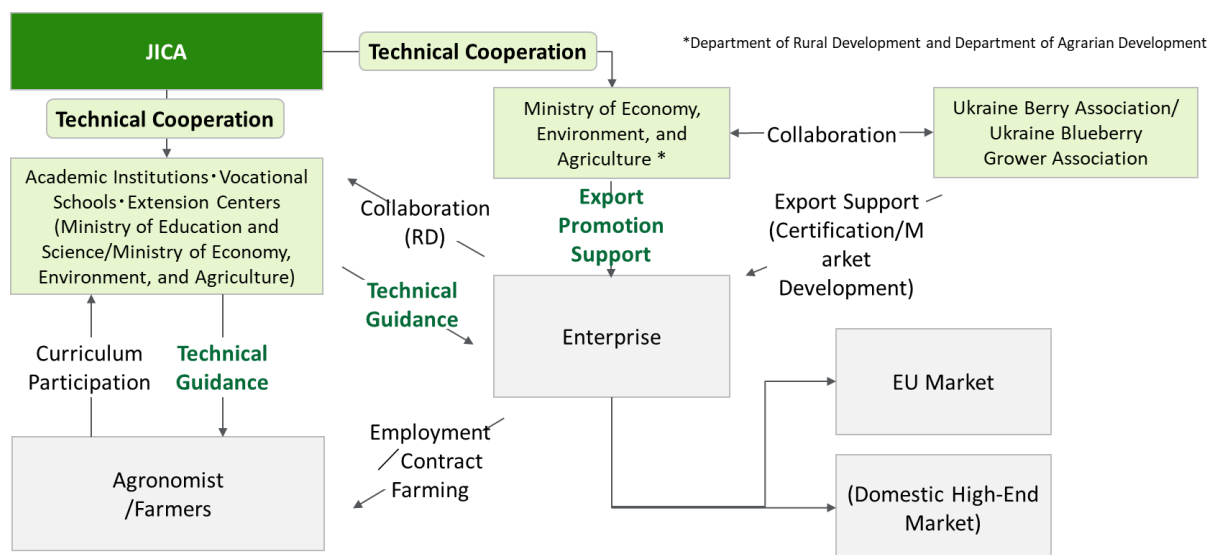
The implementation of this project is expected to yield the following outcomes:

1. Improvement in the yield and quality of blueberries through enhanced production technology.
2. Enhanced competitiveness in export markets through the acquisition of international certifications.
3. An increase in export volume resulting from the expansion of sales channels, with a particular

focus on the EU market.

Beneficiaries: Blueberry cultivation enterprises (including some Household)

Implementing Agencies: Ministry of Economy, Environment and Agriculture (Department of Rural Development and Department of Agrarian Development), and Ministry of Education and Science of Ukraine.



Source: JICA survey team

Figure 3.5.3 Production Technology Enhancement and Export Promotion Project (Technical Cooperation Project)

3.5.2 Two-Step Loan Project for Strengthening Climate Risk Countermeasures (Japanese ODA Loan)

This proposal outlines a measure to establish a sustainable agricultural production system by providing capital investment support to the agricultural sector in Ukraine, with a focus on blueberry and strawberry producers. The objective is to mitigate frost damage and expand the cultivation of high-value-added crops. In Ukraine, blueberry and strawberry production is predominantly conducted through open-field cultivation, which makes it highly vulnerable to the impacts of frost damage and climate change. As a result, the sector faces several challenges, including reduced yields, price collapses due to oversupply during harvest seasons, and quality degradation. Furthermore, infrastructure such as greenhouses and frost protection equipment are inadequate, and there is a shortage of capital and technology needed to introduce high-value cultivation methods.

This initiative proposes a framework wherein JICA will provide financial support through a Yen Loan (Two-Step Loan) and implement accompanying technical cooperation to promote the effective utilization of protected cultivation facilities. Specifically, the framework includes the following components:

1) Financial Support through a Two-Step Loan

- ✓ JICA will provide an Japanese ODA Loan to the Government of Ukraine. The funds will then be channeled through government-designated financial institutions to provide financing to berry producers for capital investments.
- ✓ The funds will be allocated for the introduction of frost protection systems, greenhouse facilities, processing equipment, and other necessary infrastructure. This will facilitate the development of agricultural infrastructure capable of responding to climate change risks.

2) Implementation of Technical Cooperation

- ✓ To promote the adoption and efficient operation of protected cultivation, this component will be implemented in combination with the production technology support and export promotion assistance described in Proposal #1.
- ✓ The project will involve disseminating cultivation techniques for high-value-added crops by providing technical guidance to producers, supporting human resource development, and assisting with the acquisition of international certifications.
- ✓ In collaboration with the Ukraine Berry Association (UBA) and the Ukrainian Blueberry Grower Association (UBGA), the project will support market development targeting the EU and domestic high-end markets.

Project Purpose

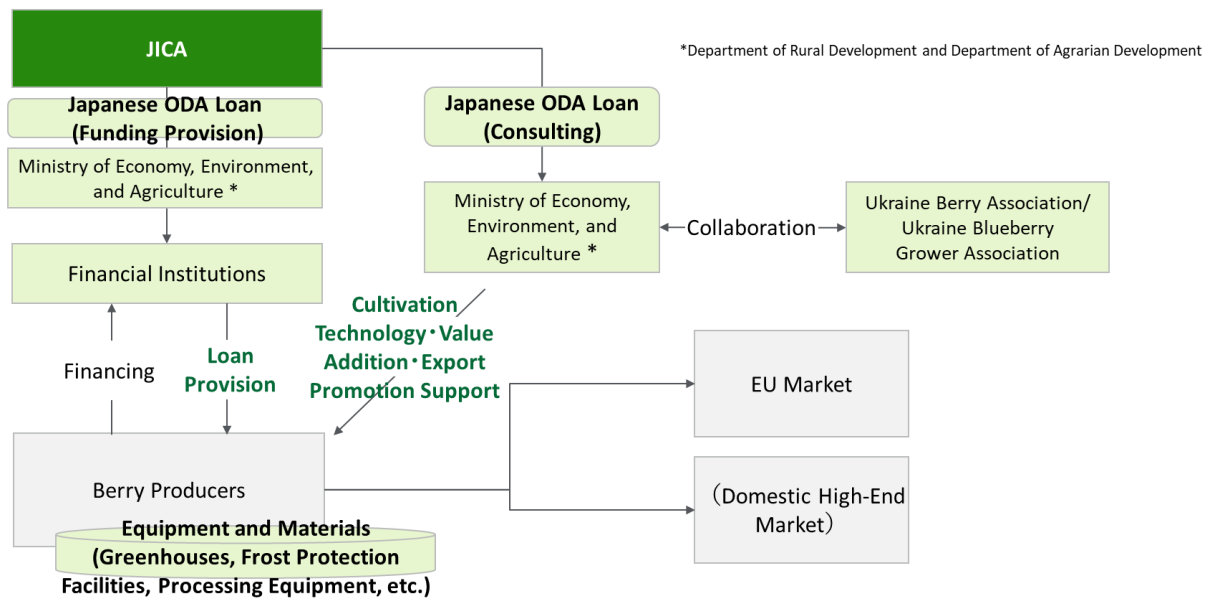
The objective is to build a frost-resistant production system to mitigate the impacts of climate change, promote the cultivation of high-value-added crops, and enhance competitiveness in export markets, particularly for blueberries.

The implementation of this project is expected to yield the following outcomes:

1. Increased adoption of cultivation equipment and protected cultivation, leading to strengthened frost damage countermeasures and improved yields.
2. An increase in the production and export volume of high-value-added strawberries and blueberries.
3. Further expansion of export volume through the implementation of export enhancement support, primarily targeting the EU market.

Beneficiaries: Berry cultivation enterprises/households

Implementing Agencies: Ministry of Economy, Environment and Agriculture (Department of Rural Development and Department of Agrarian Development), and Ministry of Finance of Ukraine; and designated financial institutions.



Source: JICA survey team

Figure 3.5.4 Two-Step Loan for Strengthening Climate Risk Countermeasures (Japanese ODA Loan)

Applicability of Japanese Technologies

The introduction of advanced Japanese equipment and materials is considered a potential use of the loans provided to producers under this program. In Japan, fruit cultivation, including berries, faces climatic risks such as frost damage, similar to the conditions in Ukraine. Consequently, various countermeasures and technologies have been developed. For instance, to mitigate frost damage for blueberries cultivated in open fields, the installation of anti-frost fans¹⁰⁶ presents a viable option. These fans are widely utilized in Japan, not only for fruit orchards but also extensively for tea plantations. Japanese anti-frost fans are noted for their advantages, which include high-efficiency and low-noise operation through inverter control, automatic functionality linked with weather sensors, and durable, cold-resistant, and anti-corrosion specifications. A diverse product lineup is available, featuring compact tower models that are adaptable to the various topographical conditions across Ukraine.

Furthermore, for the irrigation systems used in both open-field blueberry cultivation and greenhouse strawberry production, introducing advanced Japanese irrigation technology has the potential to enhance productivity and, in turn, improve farmer profitability. These outcomes can be achieved by improving water-use efficiency and promoting crop growth. For example, incorporating a nano-bubble generator, a proprietary technology of Kakuichi Co., Ltd.¹⁰⁷, can contribute to crop growth promotion and yield increases. This technology can be installed "in-line" with existing drip irrigation and nutrient solution circulation systems. It is characterized by its ability to stably generate ultra-fine bubbles from air or

¹⁰⁶ Sowonet, <https://www.sowanet.co.jp/item/16-item.html> (Retrieved January 26, 2026)

¹⁰⁷ Kakuichi, <https://www.kaku-ichi.co.jp/aqua/> (Retrieved January 26, 2026)

oxygen that remain suspended in the water for extended periods. This process is expected to increase dissolved oxygen levels, thereby improving rhizosphere aeration. As a result, it is anticipated to enhance root development and nutrient uptake efficiency, promote fruit enlargement and coloration, and improve overall quality attributes such as sugar content (Brix), firmness, and size grading.

CHAPTER4 MILK VALUE CHAIN

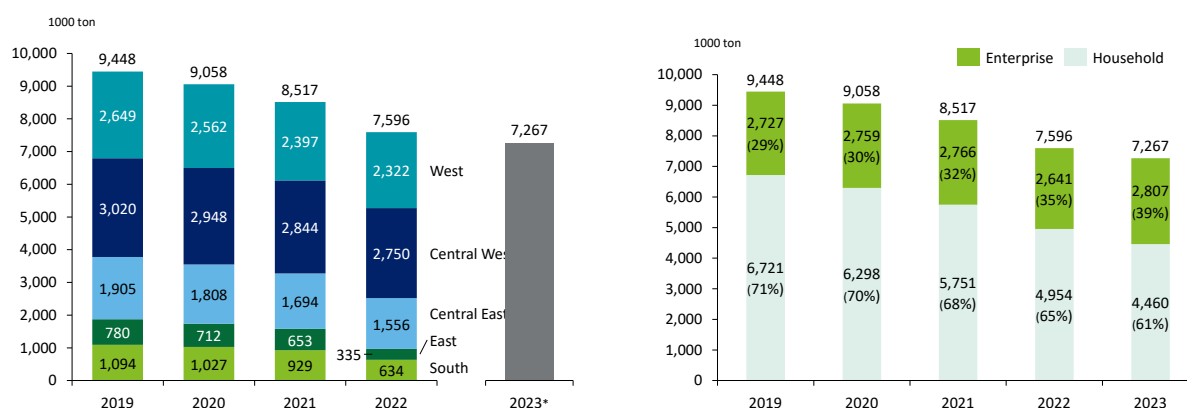
4.1 Overview

4.1.1 Production

(1) Raw Milk Production in Ukraine: Current Status (2023) and Future Trends

In 2023, the total raw milk production in Ukraine amounted to 7.267 million tons. This volume was composed of 2.807 million tons from enterprises and 4.460 million tons from households. This structure indicates that households account for approximately 60% of the total production, highlighting the critical role of this farming category in the domestic milk supply. This production structure is strongly correlated with the number of dairy cattle; enterprises held 382,000 head, whereas households managed more than double this figure, at 881,000 head.

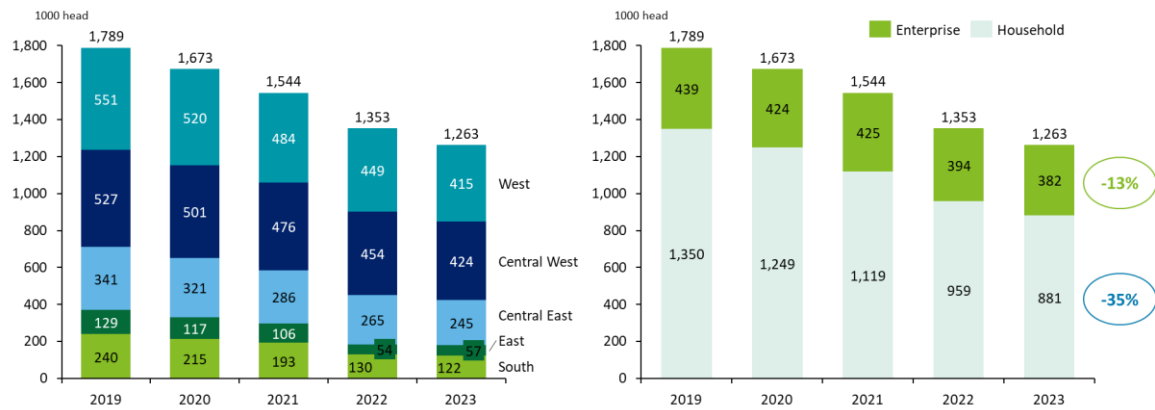
Meanwhile, both raw milk production and the number of dairy cattle have been on a downward trend. Specifically, analysis of the period from 2019 to 2023 reveals that while the number of cattle in enterprises decreased by 13%, households experienced a significantly sharper decline of 35%. This trend is considered to be attributable to the deterioration of profitability, which stems from the soaring prices of fuel and animal feed. Consequently, it is presumed that a large number of households with vulnerable business foundations have been forced to cease their operations and exit the sector.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

*2023: Nationwide aggregate only

Figure 4.1.1 Raw Milk Supply Trends: By Region (left) and By Farm Type (right)

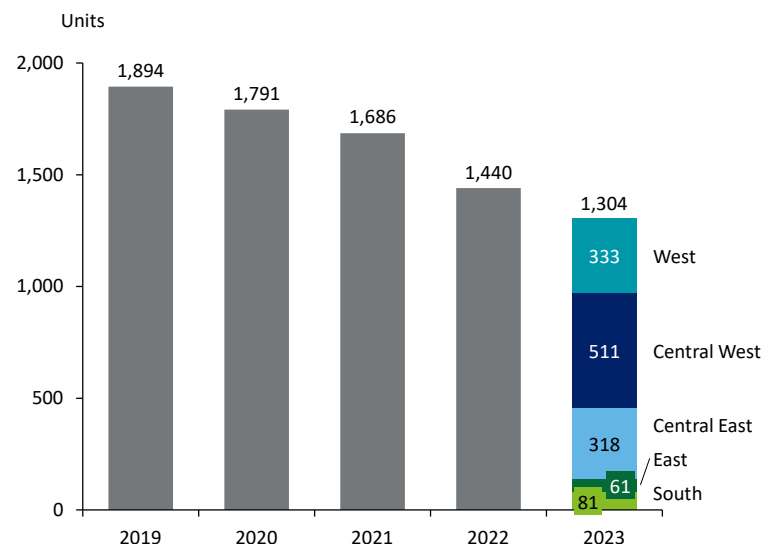


Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure 4.1.2 Dairy Cattle Population Trends: By Region (left) and By Farm Type (right)

Against the backdrop of this declining trend among households, it is projected that by February 2025, production from dairy enterprises will account for approximately 55% of the total raw milk output, surpassing the share of households¹⁰⁸. This suggests a future structural shift in Ukraine's dairy sector towards a system centered on dairy enterprises.

A regional analysis of production trends reveals that the western and west-central regions are characterized by higher raw milk production and larger dairy cattle populations compared to other areas. More specifically, while dairy enterprises are predominantly concentrated in the west-central region, the western region shows a tendency to have a relatively high number of large-scale operations with more cattle per farm.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

¹⁰⁸ Interfax-ukraine. "Ukrainian dairy farms increase milk production by 4% in Feb". 2025-03-25. <https://en.interfax.com.ua/news/economic/1058678.html>, (Accessed 2025-08-21).

[fisheries](#))

(2019-2022: Nationwide aggregate only)

Figure 4.1.3 Trends in the Number of Enterprise Dairy Farms: By Region

Furthermore, a geographical restructuring of the domestic dairy industry is underway, influenced by the full-scale invasion. As parts of the west-central and east-central regions, where dairy farming has historically been active, have become frontline areas, the relocation of production facilities to regions considered safer is in progress. Specifically, this includes moves to oblasts such as Ternopil and Ivano-Frankivsk in the west, and Odesa in the south¹⁰⁹.

In response to these domestic production trends, the Government of Ukraine formulated the "Dairy Industry Development Strategy Program until 2030" in 2020¹¹⁰. The program sets a primary objective to restore annual milk production to 10 million tons by 2030. Associated targets include achieving a dairy cattle population of 3 million head per year, an annual milk processing volume of 8 million tons, and a per capita consumption of milk and dairy products of 250 kg per year. The total cost to achieve these goals is estimated at UAH 90 billion (€1.8 billion), of which 50% is planned to be covered by the state budget. Specific measures incorporated in the program include: subsidies for dairy farmers and processors, stable state procurement of dairy products, exemption from Value Added Tax (VAT) on imported equipment, and the establishment of a special fund financed by customs duties on imported dairy products.

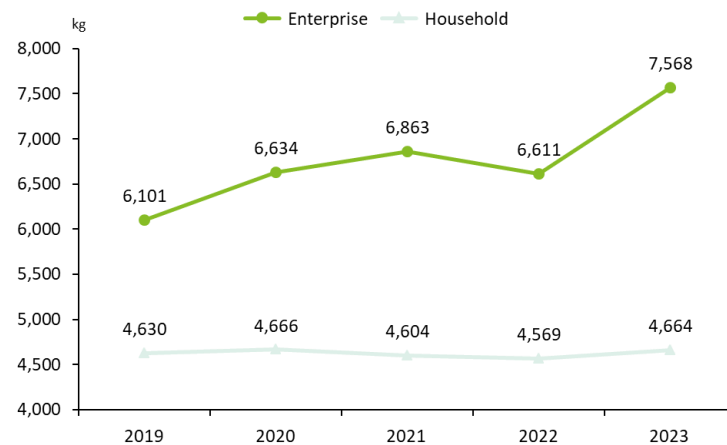
(2) Comparison of Productivity

An examination of the annual raw milk production per dairy cow in 2023 reveals a significant disparity in productivity between the different farming categories. Specifically, while the yield in dairy enterprises reached approximately 7.5 tons per year, that of households remained at approximately 4.6 tons per year. This trend is also evident over time; data from 2019 to 2023 shows that while the productivity of enterprises has continued to improve, that of households has remained largely stagnant.

This productivity gap is considered to be driven by the enhancement of efficient production systems, particularly within enterprises. The fact that total feed consumption has remained stable amidst a declining national dairy herd suggests an increase in the feed allocation per head. This is presumed to be the result of a management strategy by enterprises to strengthen profitability by improving individual animal productivity through active expansion of operational scale and capital investment.

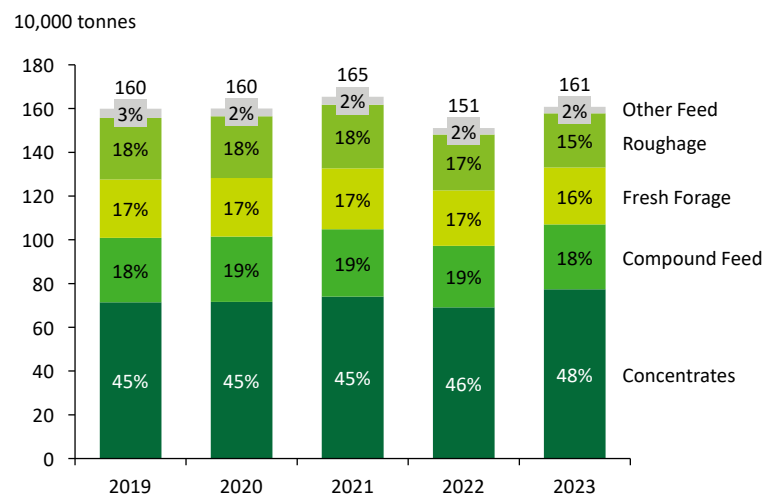
¹⁰⁹ AMP. "Due to the war, Ukraine lost 233,700 cows". 2022-12-23. <https://avm-ua.org/en/post/due-to-the-war-ukraine-lost-233700-cows>, (Accessed 2025-08-21).

¹¹⁰ Vadim Petrovich Chagarovsky. "Ukraine's dairy industry and its future in 10 years: problems, national development program and state support". 2020-10-18. <https://agropolit.com/blog/412-molochna-galuz-ukrayini-ta-yiyi-maybutnye-cherez-10-rokiv-problemi-natsionalna-programa-rozvitku-ta-derjavna-pidtrimka>, (Accessed 2025-08-21).



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>) ("Production of milk," used as "Raw Milk Supply").

Figure4.1.4 Trends in Milk Yield per Cow: By Farm Type



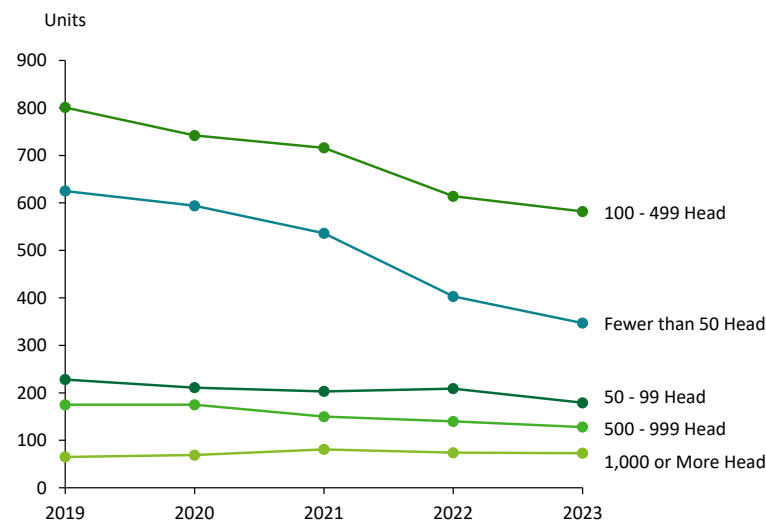
Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>) (Unit converted as 1 centner = 0.1 tons) *Total feed volume for cattle and water buffalo nationwide

Figure4.1.5 Trends in Feed Consumption and Composition Ratio for Enterprise Dairy Farms*

Furthermore, an analysis of dairy enterprises by operational scale indicates a declining trend for small-scale operations (fewer than 50 head) and medium-scale operations (100-499 head). In contrast, the number of large-scale operations (1,000 or More Head) is increasing, which suggests that consolidation toward larger entities is progressing even within the enterprise category. From this trend, it is anticipated that the consolidation into large-scale operations will continue, further promoting efficiency and competitiveness.

It can be inferred that the background to this consolidation and expansion of scale includes international competitive pressures and a changing domestic market environment. This appears to be accelerating a process of selection and consolidation that favors operations with superior capital strength and technological capacity. Therefore, it is expected that the improvement of productivity and the

expansion of scale within dairy enterprises will remain a fundamental trend in the Ukrainian dairy sector.



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure4.1.6 Trends in the Number of Enterprise Dairy Farms: By Farm Size

(3) Raw Milk Quality and Distribution

In Ukraine, the quality of raw milk has been regulated under a system of four grades established by national standards. Until 2019, the standard DSTU 3662-97 was applied¹¹¹, which stipulated 'Second' grade as the minimum standard for shipment from among four grades: Extra, Higher, First, and Second. However, driven by the objective of strengthening exports to the EU market, a new standard, DSTU 3662-2018, was introduced in 2020¹¹². As a result, the system was reorganized into three grades (Extra, Higher, and First), with the 'Second' grade, which did not meet the shipment criteria, being abolished in principle. To accommodate producers' adaptation¹¹², a transitional period was in place until 2022, during which the shipment of 'Second' grade milk was permitted exclusively for non-food applications such as casein and animal feed¹¹³.

Raw milk quality standards are projected to become even more stringent. Following the lifting of the currently imposed martial law¹¹⁴, it is planned that one year later (August 2026), only milk of 'Higher' grade or above will be permitted for shipment. Two years after the lifting (August 2027), this will be

¹¹¹ Svitlana Yermak et Al. "PROBLEMS OF ENSURING MILK QUALITY IN UKRAINE IN TERMS OF EUROPEAN STANDARDS IMPLEMENTATION". 2020-07-01. <https://keypublishing.org/jhed/wp-content/uploads/2020/07/01.-Full-paper-Svitlana-Yermak.pdf>, (Accessed 2025-08-21).

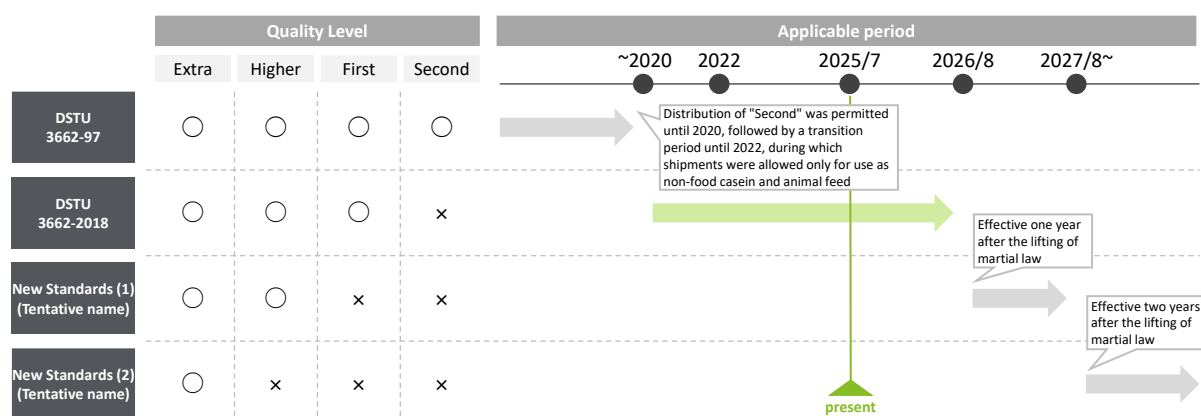
¹¹² Marina Solonar. "New standards for milk: Is the second grade not a shortage?". 2020-02-19. <https://kurkul.com/spetsproekty/729-novi-standarti-na-moloko-drugiy-sort-ne-brak>, (Accessed 2025-08-21).

¹¹³ European Pravda. "Association with the EU: second-grade milk will be accepted until January 1, 2020". 2018-02-3. <https://www.eurointegration.com.ua/news/2018/07/3/7083898/>, (Accessed 2025-08-21).

¹¹⁴ Olena Harmash, David Holmes. "Ukraine's parliament extends martial law until August". 2025-04-16. <https://www.reuters.com/world/europe/ukraines-parliament-extends-martial-law-until-august-2025-04-16/>, (Accessed 2025-08-21).

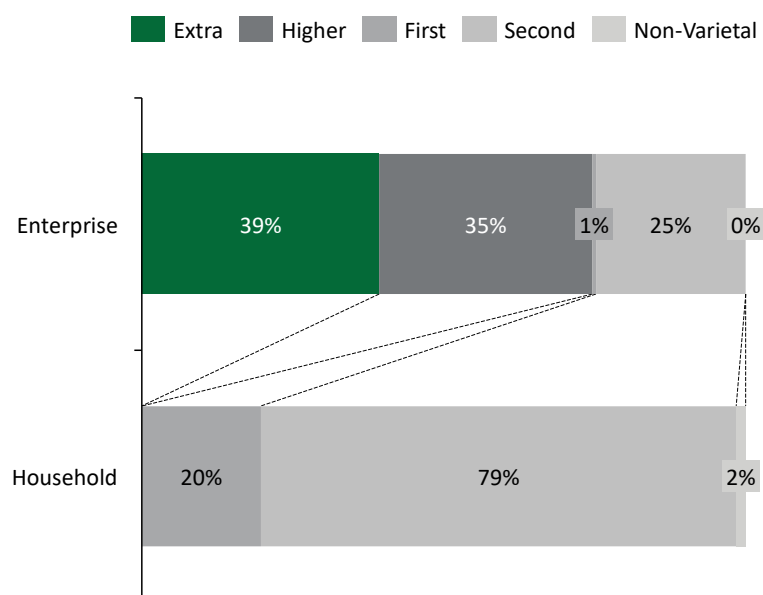
further restricted to only the 'Extra' grade, which is equivalent to EU export standards¹¹⁵.

A strong correlation exists between these quality standards and the farming category. According to 2021 procurement data from dairy processors, dairy enterprises produced high-quality raw milk, with 39% classified as 'Extra' grade and 35% as 'Higher'. This quality shows an upward trend, with the proportion of 'Extra' grade reaching 49% by 2023. In contrast, milk from households was of relatively lower quality, comprising 20% 'First' grade and 79% 'Second' grade. As a substantial portion of this milk does not meet current shipment standards, it is presumed that it cannot be supplied to dairy processors and is largely limited to self-consumption or distribution within local markets.



Source: JICA survey team

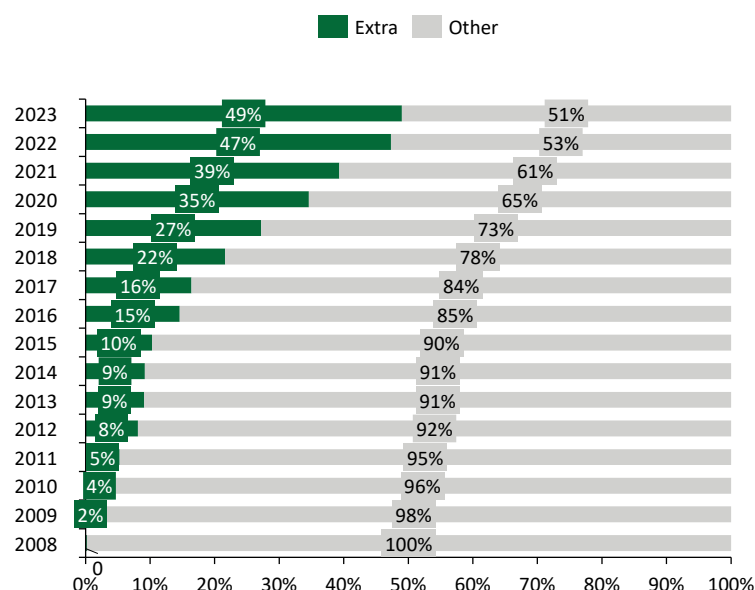
Figure 4.1.7 Raw Milk Quality Standards



Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

¹¹⁵ MINISTRY OF AGRARIAN POLICY AND FOOD OF UKRAINE. "On Approval of the Requirements for the Safety and Quality of Milk and Dairy Products". 2024-09-09. <https://zakon.rada.gov.ua/laws/show/z0593-19#n43>, (Accessed 2025-08-21).

Figure4.1.8 Raw Milk Procured by Dairy Processors: Distribution of Quality Grades by Farm Size (2021)



Source: JICA survey team based on Ukraine Dairy Map – 2024 (<https://infagro.com.ua/eng/milk-map-of-ukraine-2024/>)

Figure4.1.9 Trends in Quality Grade Composition of Raw Milk from Enterprise Dairy Farms

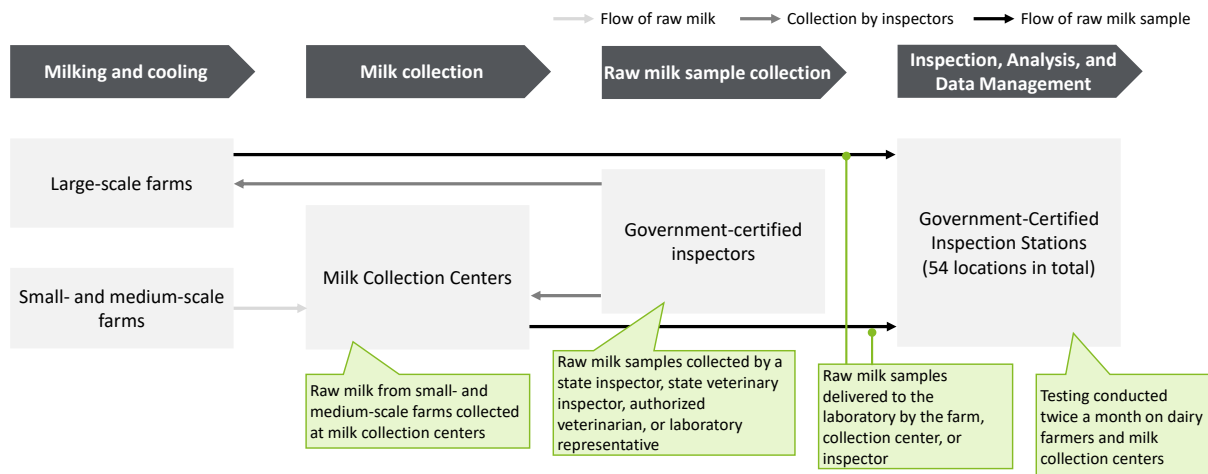
To ensure this quality control, dairy farmers and milk collection centers that ship raw milk for commercial purposes are mandated to undergo bi-monthly inspections¹¹⁶. Conducted under the jurisdiction of the Ministry of Agrarian Policy and Food, these inspections are primarily carried out by the State Service on Food Safety and Consumer Protection. Raw milk that fails to meet the 'First' grade standard is not permitted for shipment, and a shipment suspension order is issued if the standard is not met for three consecutive months¹¹⁷.

Inspections are conducted by impartial personnel—including state inspectors, state veterinary inspectors, certified veterinarians, or laboratory representatives—who collect samples from farms or collection centers¹¹⁸. For small-scale farms, a system is in place where milk collection centers separately store samples from each farm to facilitate the inspection process.

¹¹⁶ Union of Dairy Enterprises of Ukraine. "Raw Milk Control Program: From Pilot Project to National Level". <https://uadairy.com/programa-kontrolyu-syrogo-moloka-vid-pilotnogo-proyektu-do-nacziionalnogo-rivnya/>, (Accessed 2025-08-21).

¹¹⁷ Vitaliy Bashynskiy. "How not to be outlawed: innovations in state control of milk". 2024-01-15. <https://milkua.info/uk/post/ak-ne-opinitisa-poza-zakonom-novovvedenna-sodo-derzavnogo-kontrolyu-moloka>, (Accessed 2025-08-21).

¹¹⁸ ABM. "Raw Milk Sample Logistics: Raw Milk Control Program in Ukraine". 2025-04-22. <https://avm-ua.org/uk/post/logistika-zrazkiv-sirogo-moloka-programa-kontrolyu-sirogo-moloka-v-ukraini>, (Accessed 2025-08-21).



Source: JICA survey team

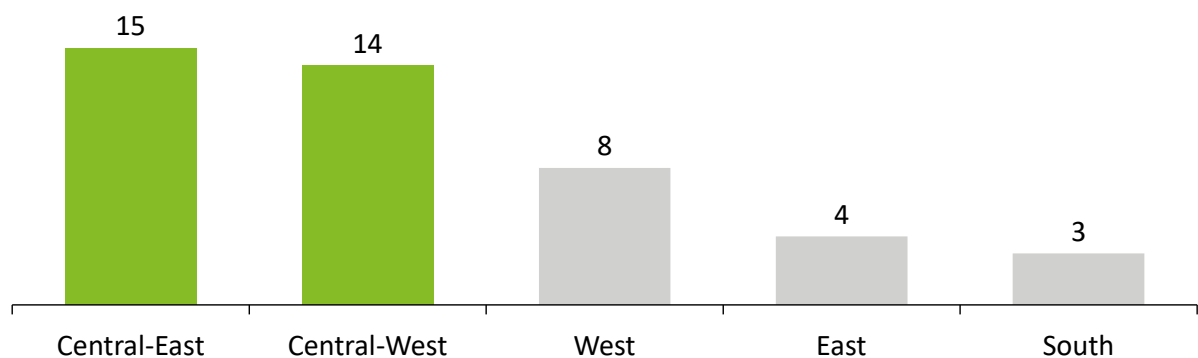
Figure 4.1.10 Raw Milk Inspection Flow

The key inspection parameters and their frequencies are defined as follows: total bacterial count (twice a month), somatic cell count (once a month), and inhibitors such as antibiotics (once a month)

¹¹⁹.

As of 2025, there are 54 accredited laboratories in the country to conduct these tests¹²⁰. They are predominantly concentrated in the east-central (15 laboratories) and west-central (14 laboratories) regions, whereas the numbers are lower in the western (8), eastern (4), and southern (3) regions.

However, it is considered that the number of laboratories in the western region is sufficient to meet current demand, as this area has a high concentration of large-scale enterprises, which leads to a consolidation of testing services.



Source: : JICA survey team based on DPSS (<https://dpss.gov.ua/diyalnist/bezpechnist-harchovih-produktiv-ta-veterinarno-medicyna/prohrama-kontroliu-syroho-moloka/upovnovazheni-laboratorii>)

¹¹⁹ Union of Dairy Enterprises of Ukraine. "Raw Milk Control Program: From Pilot Project to National Level". <https://uadairy.com/programa-kontrolyu-syrogo-moloka-vid-pilotnogo-proyektu-do-nacziionalnogo-rivnya/>, (Accessed 2025-08-21).

¹²⁰ STATE SERVICE OF UKRAINE ON FOOD SAFETY AND CONSUMER PROTECTION. "За результатами запровадження П р о г р а м и контролю сирого молока на базі інформаційно-комунікаційної системи Д е р ж а в н о ї служби України з питань безпечності х а р ч о в и х продуктів та захисту споживачів («Молочний модуль») у 2024 році". <https://dpss.gov.ua/storage/app/sites/12/uploaded-files/ricnii-zvit-2025-veb.pdf>, (Accessed 2025-08-21).

*Data from 44 regional inspection centers is used as a substitute due to the unavailability of data for the full 54 centers.

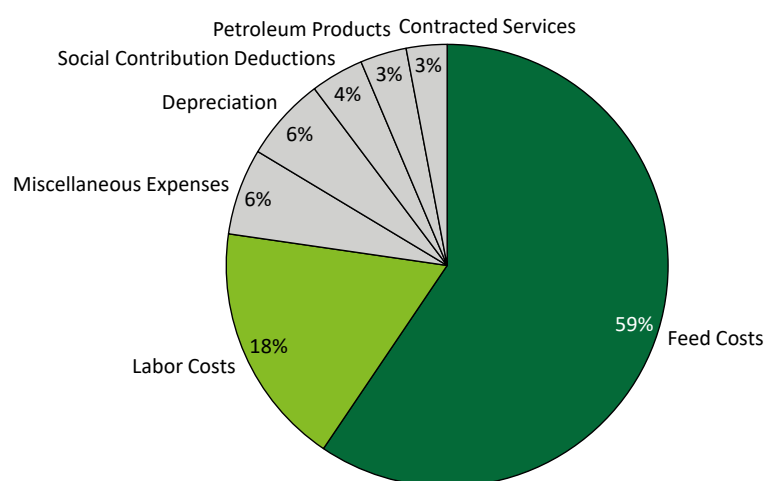
Figure 4.1.11 Number of Raw Milk Inspection Centers*: By Area

To reinforce this regulatory framework, the government, with support from Switzerland, has been promoting the "Quality and Safety of Raw Milk Control Program" since 2019. The program aims to establish a system to align the country's raw milk quality with EU standards, focusing on the dissemination of an IT platform known as the "Dairy Module." This platform is designed to thoroughly monitor inspection processes and manage quality data. As of January 2025, the adoption rate of this system was approximately 59% among all business operators involved in milk and dairy product activities, but remained at approximately 28% when limited to milk collection center¹²⁰.

(4) Impact of Feed

An examination of the production cost structure for raw milk within dairy enterprises, as of 2020, reveals that feed costs (59%) and labor costs (18%) constitute the vast majority of expenditures. Feed cost, in particular, stands out as the single largest variable factor impacting profitability. In fact, it has been confirmed that not only did the intermediate unit price of domestic feed increase by approximately 23% from 2019 to 2021¹²¹, but the prices of key feed additives, including vitamins, minerals, and amino acids, have also been soaring¹²².

In this context, while dairy enterprises are increasing feed allocation per head to enhance productivity¹⁵, the aforementioned surge in feed prices is considered to significantly erode the profitability gains derived from these operational efforts. This cost pressure is even more acute for households with vulnerable business foundations, and it is presumed to be one of the direct triggers compelling many to cease their operations and exit the sector.



¹²¹ State Statistics Service of Ukraine. "Official Website". <https://stat.gov.ua/en>. (Accessed 2025-08-21).

¹²² Eastern European Correspondents. "Feed additives prices soar in Ukraine". 2022-08-08. <https://www.allaboutfeed.net/animal-feed/feed-additives/feed-additives-prices-soar-in-ukraine/>. (Accessed 2025-08-21).

Source: JICA survey team based on State Statistics Service of Ukraine (Based on the average for Enterprise dairy farms)
(<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure4.1.12 Breakdown of Total Raw Milk Cost by Item (2020)

4.1.2 Processing

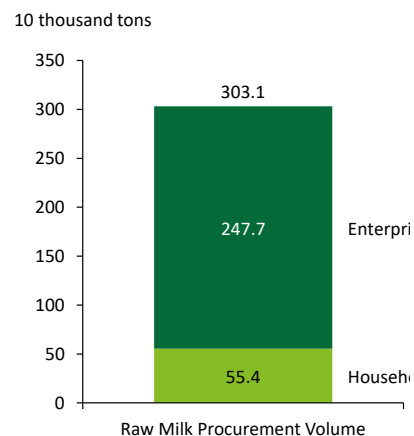
(1) Procurement of Raw Milk

In 2021, the total volume of raw milk procured by domestic dairy processors amounted to 3.031 million tons. The breakdown of this supply by source was 2.477 million tons from dairy enterprises and 0.554 million tons from households. This indicates a structure in which dairy processors are heavily reliant on dairy enterprises for their raw material procurement, as they account for 81.7% of the total volume supplied.

This difference in the source of supply is also clearly reflected in the quality and transaction price of the raw milk. While milk procured from dairy enterprises consists mainly of 'Extra' (39%) and 'Higher' (35%) grades, the vast majority of that from households comprises 'First' (20%) and 'Second' (79%) grades, showing a significant disparity in quality. Reflecting this quality difference, a differential has arisen in the average purchase price per ton. The average price for milk from enterprises was UAH 9,935.8 (€198.7), compared to UAH 6,920.9 (€138.4) for milk from households¹⁷. This constitutes a price gap of approximately 1.4 times.

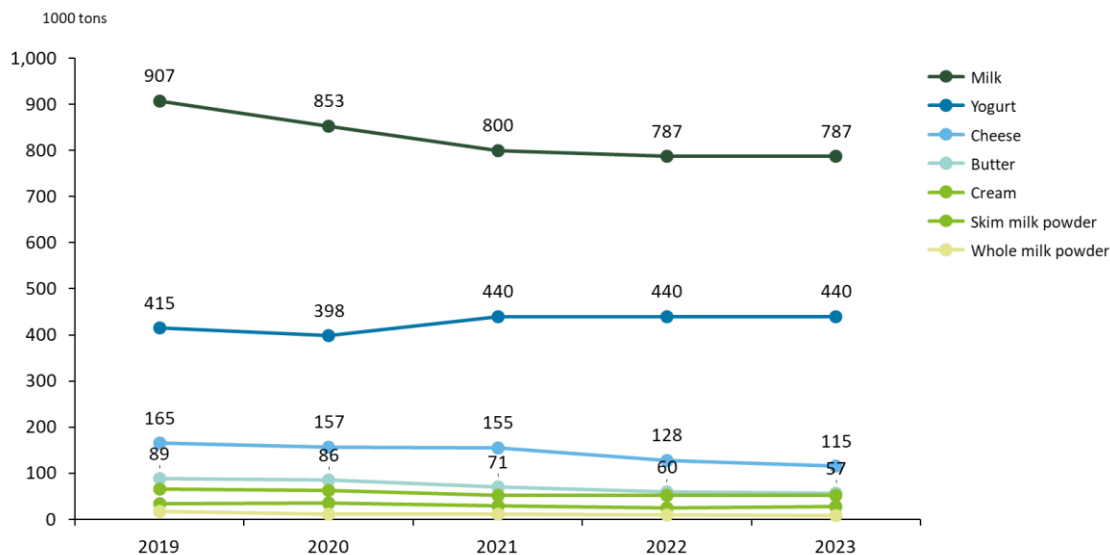
(2) Production of Dairy Products

Processed dairy products in Ukraine predominantly consist of fermented items such as liquid milk and yogurt. However, the domestic production of these products has been on a downward trend, a pattern that was established even before the full-scale invasion. This decline is considered to be primarily attributable to the reduced domestic output of raw milk, which constitutes the main raw material for the processing sector.



Source: JICA survey team based on State Statistics Service of Ukraine
(<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

Figure4.1.13 Raw Milk Procurement by Dairy Processors: Breakdown by Supplier Type (2021)



Source: JICA survey team based on JIDF 「The global dairy farming situation」 (https://www.j-milk.jp/gyokai/database/jidf_faostat.html#hdg10)

Figure4.1.14 Trends in Dairy Product Production

(3) Impact of the Invasion

The full—scale invasion has presented a complex and severe set of challenges to the value chain of Ukraine's dairy farming and milk processing industries. Among the most pressing of these are the destruction of transportation infrastructure and the resulting logistical constraints. Martial law, declared in the initial phase of the invasion in 2022, disrupted conventional raw milk collection routes and, combined with attacks on distribution centers, imposed geographical limitations on the supply chain¹²³.

This situation has persisted, with the extension of martial law decided until August 2025. With curfews still enforced in some regions, logistical constraints continue. As of 2024, with approximately 150 destroyed or damaged bridges yet to be restored¹²⁴, it is presumed that the collection of raw milk and the shipment of products remain extremely difficult in certain areas.

Secondly, the instability of the energy supply and soaring costs are major factors that directly strain the industry's operations. While electricity and fuel are indispensable for operating dairy processing equipment and tankers, intensive attacks on energy infrastructure, particularly from the autumn to winter of 2022, caused widespread power outages. This compelled many operators to use private generators, imposing additional cost burdens¹²⁵. Furthermore, the price of diesel fuel surged to approximately twice

¹²³ AMP. "Massive Russian Attack: Farm Damaged in Nizhyn District, 11 Cows Killed". 2024-12-16. <https://avm-ua.org/en/post/massive-russian-attack-farm-damaged-in-nizhyn-district-11-cows-killed>, (Accessed 2025-08-21).

¹²⁴ Ministry of Economy, Trade and Industry, Trade Policy Bureau, Europe Division. "FY2022 Supplementary Budget Program: Support for Overseas Deployment of Infrastructure Systems to Address Local Social Issues (Feasibility Study on Normalizing Traffic and Logistics through Bridge Restoration in Ukraine)". 2024-02. https://www.meti.go.jp/medi_lib/report/2022FY/060368.pdf, (Accessed 2025-08-21).

¹²⁵ AMP. "We keep the farm and the line! How dairy farm LLC Peremoha (Cherkasy region) accepts the challenge of power failure". 2022-10-27. <https://avm-ua.org/en/post/we-keep-the-farm-and-the-line-how-dairy-farm-llc-peremoha-cherkasy-region-accepts-the-challenge-of-power-failure>, (Accessed 2025-08-21).

its pre-invasion level in May 2022 and has since remained elevated, persistently driving up both transportation and power generation costs¹²⁶.

Finally, the physical damage to production facilities has been extensive. A number of dairy processing plants located in regions affected by the invasion have been damaged or destroyed by direct shelling and other attacks, forcing many to suspend their operations. This has created a severe situation, not only significantly reducing the raw milk processing capacity in those regions but also directly contributing to the decline in the national output of dairy products¹²⁷.

4.2 Consumption: Domestic and International Trends and Future Projections

4.2.1 Domestic Consumption

(1) Consumption of Dairy Products

The per capita consumption of dairy products in Ukraine has been on a gradual downward trend, standing at 202 kg per year as of 2021. This decline in consumption is considered to be attributable to the continuous rise in the retail prices of dairy products. In fact, between 2015 and 2021, dairy product prices increased by 137%, which is presumed to have curbed consumer demand¹²⁸.

The primary factors contributing to this price surge include increased production costs, such as for feed and transportation driven by inflation, and a reduction in raw milk supply stemming from natural disasters and conflict. In terms of specific products, the price increase is particularly pronounced for cheese, due to the large volume of raw milk required for its production. The price index for cheese is projected to reach 251.7% over the period from 2018 to 2025¹²⁹.

Notably, from 2019 to 2021, prior to the full-scale invasion, demand for premium products, particularly high-priced cheeses, was expanding¹³⁰, driven by rising incomes. However, following the invasion, this trend has reversed into a clear decline. This reversal is attributed to heightened economic uncertainty and a reduction in real purchasing power, which is believed to be significantly impacting the premium dairy market¹³⁰.

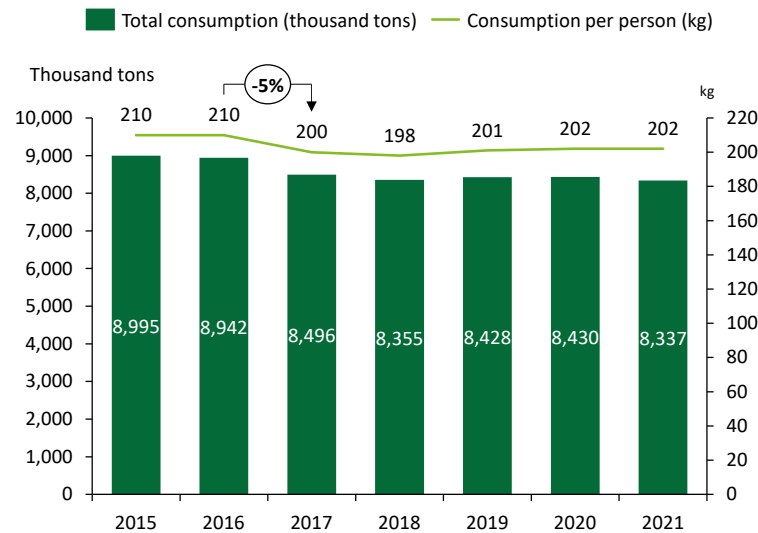
¹²⁶ JICA. "Information Collection and Verification Survey for Ukraine's Recovery and Reconstruction in the Agricultural Sector (Domestic Implementing Partner)". 2024-04. https://openjicareport.jica.go.jp/pdf/1000052562_01.pdf, (Accessed 2025-08-21).

¹²⁷ LVVN Attaché Network. "Ukraine and the Netherlands in the Global Dairy Landscape. Challenges & Opportunities". 2024-08-08. <https://www.agroberichtenbuitenland.nl/actueel/nieuws/2024/08/08/ukraine-dairy-challenges>, (Accessed 2025-08-21).

¹²⁸ State Statistics Service of Ukraine. "Official Website". <https://stat.gov.ua/en>, (Accessed 2025-08-21).

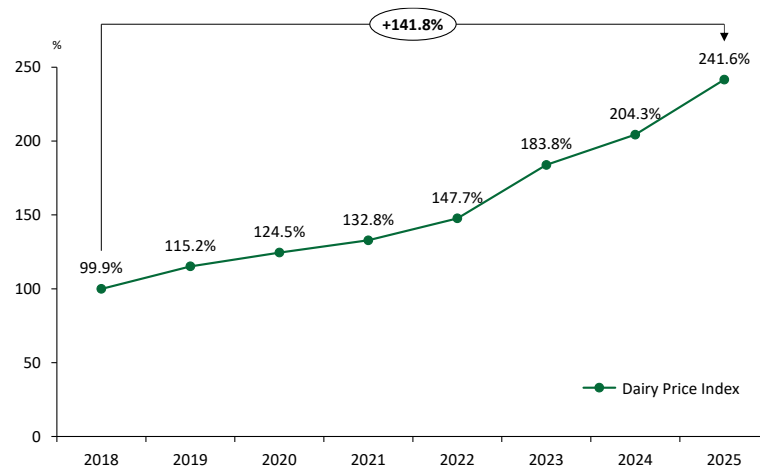
¹²⁹ MinfinMedia. "Food Price Index". 2025-08-20. <https://index.minfin.com.ua/ua/markets/wares/index/dairy>, (Accessed 2025-08-21).

¹³⁰ USDA. "Dairy and Products Annual-Ukraine 2021". 2021-10-21. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Dairy%20and%20Products%20Annual_Kyiv_Ukraine_10-15-2021, (Accessed 2025-08-21).



Source: JICA survey team based on Agroberichten Buitenland
<https://www.agroberichtenbuitenland.nl/actueel/nieuws/2025/02/21/report-cattle-meat-dairy-sectors-of-ukraine>

Figure 4.2.1 Trends in Milk and Dairy Product Consumption



Source: JICA survey team *(Base year: 2017 = 100)
<https://index.minfin.com.ua/ua/markets/wares/index/dairy/>

Figure 4.2.2 Trends in the Dairy Product Price Index*

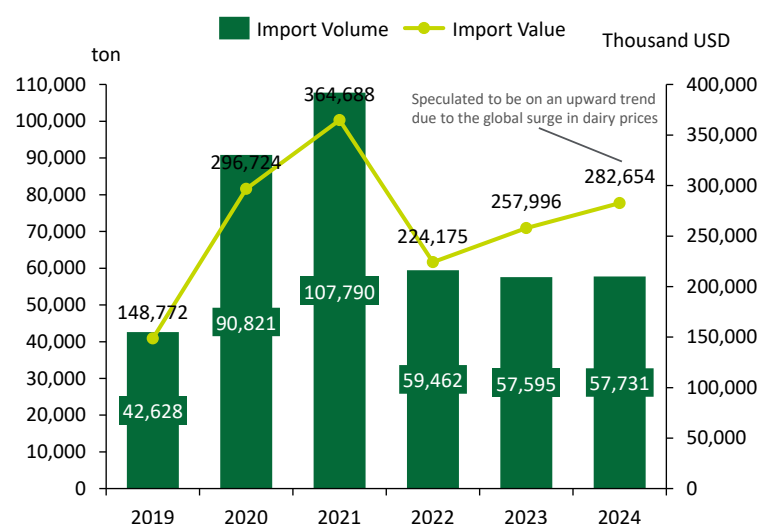
4.2.2 Imports

(1) Import Overview

Ukrainian dairy imports experienced consistent growth in both volume and value from 2019 to 2021. This expansion was largely fueled by a rising demand for premium products, such as cheese, driven by higher domestic income levels. Furthermore, the surging cost of domestic raw milk production appears to have strengthened the shift towards European dairy products, providing an additional impetus for the import surge¹³¹.

¹³¹ Verkhovna Rada of Ukraine. "Will Ukrainians get cheaper milk and dairy products?". 2020-09-14. <https://comeuroint.rada.gov.ua/en/news/73177.html>, (Accessed 2025-08-21).

However, this trend was sharply reversed with the onset of the full-scale invasion in 2022, with both import volume and value shifting to a decline from 2021 to 2022. Analysis indicates that this downturn was a direct consequence of the invasion-induced contraction of the overall dairy market. This market contraction resulted from a significant outflow of the population and a fall in disposable income, which in turn directly led to reduced demand for imported products.



Source: : JICA survey team based on WITS (<https://wits.worldbank.org/>)

Figure 4.2.3 Trends in Import Volume and Value

(2) Import Trends by Product Category

Ukrainian imports of dairy products are primarily composed of cheese, yogurt, buttermilk, and whey, with the main sources being neighboring EU countries such as Poland, Germany, and Belgium. It is presumed that prior to the full-scale invasion, the increase in imports from these EU countries was driven by expanding demand for high-quality products that domestic production was unable to meet.

Conversely, post-invasion import trends have also been strongly influenced by geopolitical factors. A case in point is milk powders (skimmed and whole milk powder). Imports of these products from Belarus, which had temporarily surged around 2021, plummeted after the commencement of the full-scale invasion in 2022. This sharp decline occurred against the backdrop of political confrontation with the country, which is an ally of Russia¹³².

Table 4.2.1 Import Volume, Value, and Major Import Countries by Item (2024)

¹³² Pavlo Rad, Iaroslav Chornogor. "Ukraine-Belarus Relations in the Shadow of War". 2024-03-16. <https://sceeus.se/en/publications/ukraine-belarus-relations-in-the-shadow-of-war/>, (Accessed 2025-08-21).

Items	Import volume	Import Value	Major Import Countries (Share)
Cheese	38,283ton	\$227,076,000	• Poland (45%), Germany (20%), Netherlands (9%)
Yogurt & Buttermilk	8,118ton	\$16,818,000	• Belgium (52%), Poland (37%), Germany (9%)
Whey	6,088ton	\$10,813,000	• Poland (59%), Germany (22%)
Butter and other fats and oils derived from milk	2,575ton	\$18,577,000	• Netherlands (27%), Poland (22%), Germany (17%)
Milk & Cream	2,020ton	\$4,048,000	• Poland (47%), Slovakia (21%)
SMP (Skimmed Milk Powder)	944ton	\$2,998,000	• Germany (58%), Germany (35%) • Belarus (2020-21 only)
WMP (Whole Milk Powder)	420ton	\$1,963,000	• Poland (66%), France (32%) • Belarus (2021 only)
Concentrated Milk (Condensed Milk) and Cream	154ton	\$361,000	• Germany (31%), Spain (28%), Poland (24%) • Belarus (2019-22 only)

Source: : JICA survey team based on WITS (<https://wits.worldbank.org/>)

4.2.3 Exports

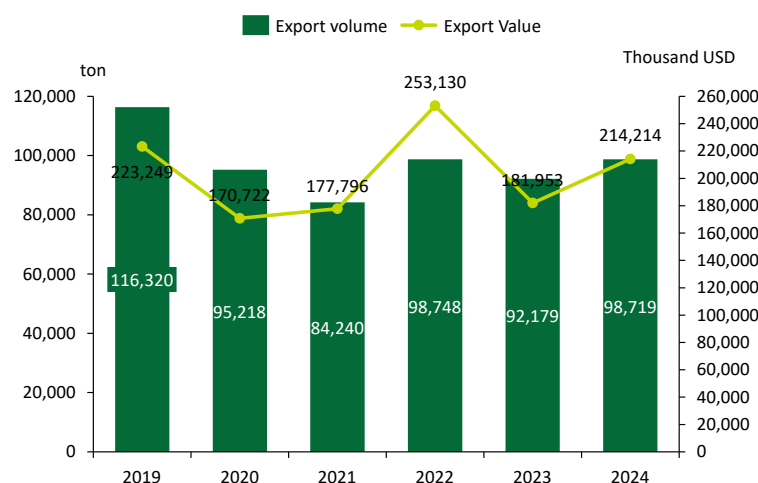
(1) Export Overview

Ukrainian exports of dairy products showed an upward trend in both value and volume from 2021 to 2022. This was primarily attributable to stagnant domestic demand resulting from the full-scale invasion, which led to surplus raw milk being channeled into processed goods for export¹³³. In addition, the temporary suspension of tariffs on Ukrainian agricultural products by the EU provided a significant tailwind for the expansion of exports to the EU bloc.

However, this trend of export expansion was short-lived, reversing into a decline from 2022 to 2023. The principal factor behind this downturn was the decline in the domestic raw milk supply itself, caused by the prolonged invasion, which reduced the absolute volume of dairy products available for export. Furthermore, the surge of Ukrainian agricultural products into the Polish market, prompted by the EU's tariff suspension, provoked backlash from local agricultural producers. It is considered that the subsequent imposition of an import ban on products including butter and cheese by the Polish government exacerbated the decline in exports to the EU¹³⁴.

¹³³ USDA. "Dairy and Products Annual-Ukraine 2023". 2023-10-23. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Dairy%20and%20Products%20Annual_Kyiv_Ukraine_UP2023-0039.pdf, (Accessed 2025-08-21).

¹³⁴ CNBC. "Poland prohibits food imports from Ukraine to soothe farmers". 2023-04-15. <https://www.cnbc.com/2023/04/15/poland-prohibits-food-imports-from-ukraine-to-soothe-farmers.html>, (Accessed 2025-08-21).



Source: JICA survey team based on WITS (<https://wits.worldbank.org/>)

Figure 4.2.4 Trends in Export Volume and Value

(2) Export Trends by Product Category

The principal dairy products exported by Ukraine include milk, cream, skimmed milk powder, whey, and cheese. These products are mainly exported to neighboring European and Asian countries, such as Moldova, Poland, Bulgaria, China, and Kazakhstan.

Regarding milk and cream, exports to Moldova have expanded since 2022. This is considered to be attributable to an increase in surplus raw milk, resulting from reduced domestic dairy demand, being exported to the neighboring country. For skimmed milk powder, exports to Poland, Bulgaria, and Lithuania have grown since 2022. In the case of whey, while China was traditionally the largest export destination, exports to Poland have expanded since 2022. This growth in export volumes for these specific products can be largely attributed to the EU's temporary suspension of tariffs on Ukrainian agricultural products, which significantly lowered the barriers to exporting to the EU bloc.

Table 4.2.2 Export Volume, Value, and Major Export Countries by Item (2024)

Items	Export volume	Export Value	Major Export Countries (Share)
Milk & Cream	26,601ton	\$17,619,000	• Moldova(93%)
SMP (Skimmed Milk Powder)	21,377ton	\$51,438,000	• Poland (25%), Bulgaria (24%), Romania (8%)
Whey	18,684ton	\$13,377,000	• Poland (25%), China (23%), Philippines (9%)
Cheese	12,423ton	\$54,185,000	• Moldova (38%), Kazakhstan (25%), Germany (11%) • Poland (2022 only)
Butter and other fats and oils derived from milk	7,178ton	\$48,897,000	• Moldova (45%), Azerbaijan (14%) • Poland (2022 only)
Concentrated Milk (Condensed Milk) and Cream	6,006ton	\$13,665,000	• Germany (41%), Moldova (15%), United States (14%)
Yogurt & Buttermilk	4,374ton	\$5,917,000	• Moldova(94%)
WMP (Whole Milk Powder)	2,073ton	\$9,116,000	• Israel (43%), Poland (31%)

Source: : JICA survey team based on WITS (<https://wits.worldbank.org/>)

4.2.4 School Nutrition Reform

(1) Overview

The School Nutrition Reform, promoted under the initiative of the Government of Ukraine and the First Lady, is being advanced in cooperation with international organizations such as the WHO and WFP. The reform aims to provide nutritionally balanced meals to children, foster a healthy food culture, and revitalize regional economies through local production for local consumption^{135, 136}.

Within this framework, milk, with its high nutritional value, is positioned as a key food item, as exemplified by the "School Milk" concept. International cooperation is also being strengthened, with Ukraine joining the "School Meals Coalition" in 2023¹³⁷.

While the reform achieved the provision of meals to approximately 1.54 million students in general secondary education institutions during the 2022-23 academic year (46% of which were free of charge), infrastructural challenges persist. Notably, the installation rate of canteens in the country's 12,926 general secondary education institutions remains at only 67.5%¹³⁸. Looking ahead, the government plans a phased expansion of the target grades. From September 2025, the target will be expanded to include grades 4 through 11 in some regions, followed by a nationwide expansion to include up to the 11th grade from September 2026¹³⁹.

To accelerate this reform, the government has established a strategy for 2023-2027 based on four key pillars: 1) securing financial resources for food procurement and equipment renovation; 2) modernizing kitchen facilities and ensuring adherence to HACCP standards; 3) providing capacity-building support for staff in local governments and educational institutions responsible for the reform; and 4) raising food and nutrition awareness among the general public, including children¹⁴⁰. Based on this strategy, the government, various foundations, and donor countries are currently collaborating to provide tangible support, such as the provision of equipment and the implementation of educational programs.

(2) Government Support Initiatives

¹³⁵ WHO. "Expanding the national school meals programme in Ukraine". 2024.
<https://iris.who.int/bitstream/handle/10665/376509/WHO-EURO-2024-9413-49185-73403-eng.pdf?sequence=1>, (Accessed 2025-08-21).

¹³⁶ Ministry of Agrarian Policy and Food of Ukraine. "Vitaliy Koval: The "School Milk" program will give impetus to the development of local farms". 2024-12-19. <https://minagro.gov.ua/news/vitalii-koval-prohrama-shkilne-moloko-dast-poshtovkh-dlia-rozvytku-lokalnykh-fermerskykh-hospodarstv>, (Accessed 2025-08-21).

¹³⁷ Quality Food Trade Program. "Ukraine hosts the European Regional School Meals Summit for the first time". 2024-11-14.
<https://qftp.org/en/news/ukraine-hosts-the-european-regional-school-meals-summit-for-the-first-time/#:~:text=This%20summit%20was%20an%20important,experiences%20and%20implementing%20best%20practices>, (Accessed 2025-08-21).

¹³⁸ Orest Stepanyak, Dmytro Sivak. "School Meals Case Study: Ukraine". 2024-04.
https://schoolmealscoalition.org/sites/default/files/2024-09/Stepanyak_Sivak_2024_School_Meals_Case_Study_Ukraine.pdf, (Accessed 2025-08-21).

¹³⁹ Ministry of Agrarian Policy and Food of Ukraine. "Expansion of the free school meal program: what will change?". 2025-03-20.
<https://mon.gov.ua/news/rozshyrennia-prohramy-bezoplatnoho-shkilnoho-kharchuvannia-shcho-zminytsia>, (Accessed 2025-08-21).

¹⁴⁰ WHO. "Expanding the national school meals programme in Ukraine". 2024.
<https://iris.who.int/bitstream/handle/10665/376509/WHO-EURO-2024-9413-49185-73403-eng.pdf?sequence=1>, (Accessed 2025-08-21).

Based on the government's School Nutrition Reform Strategy, concrete support initiatives are being implemented by domestic and international partners. Four key examples of these undertakings are outlined below¹⁴¹.

The first example relates to Pillar 1 (securing financial resources for food procurement and equipment renovation): the "Approval of a Subvention for the Modernization of School Kitchens." The government has allocated UAH 1.5 billion (€30 million) from the state budget to establish a subsidy program for renovating kitchen facilities and purchasing equipment for 173 schools.

The second initiative addresses both Pillar 1 (securing financial resources) and Pillar 3 (capacity-building support): "Education of Cooks for the School Nutrition Reform." In 2024, the government invested UAH 92.7 million (€1.85 million) to establish 11 culinary training hubs across the country. These hubs regularly conduct training aimed at enhancing the skills of cooks responsible for school meals.

The third example pertains to Pillar 2 (modernizing kitchen facilities and ensuring adherence to HACCP standards): the "Construction of a Large-Scale Factory Kitchen with Support from The Howard G. Buffett Foundation." The first facility, completed in 2023, is projected to be capable of providing meals for up to 10,000 students. A second facility in the Kharkiv region, whose construction began in 2024, is expected to serve approximately 14,000 students.

The fourth initiative focuses on Pillar 4 (raising food and nutrition awareness among the general public): "Providing Opportunities for Children to Learn About Healthy Eating." Through the "DECIDE Project¹⁴²," implemented by Switzerland as part of its support for decentralization for democratic education, an awareness-raising event on healthy eating was held in 2024. This event saw the participation of approximately 8,500 children from 27 regions across the country.

4.3 Detailed Value Chain Analysis

4.3.1 Stakeholder Structure

(1) Key Stakeholders

The Ukrainian dairy value chain is broadly composed of five interconnected stages—procurement, production, processing, distribution, and sales—and functions through the organic integration of stakeholders who fulfill specialized roles at each step.

In the Procurement stage, the initial phase of the value chain, suppliers such as feed, animal health, and dairy equipment companies provide dairy farmers with vital inputs and services for production.

These include animal feed, feed additives, veterinary medicines, herd management systems, and

¹⁴¹ Znaimo. "The School Nutrition Reform Team Digest". 2024-12. https://znaimo.gov.ua/media/pdf/Digest-2_12-24_eng_RGB.pdf, (Accessed 2025-08-21).

¹⁴² Decide. "About the project". <https://decide.in.ua/pro-nas/>, (Accessed 2025-08-21).

milking machines.

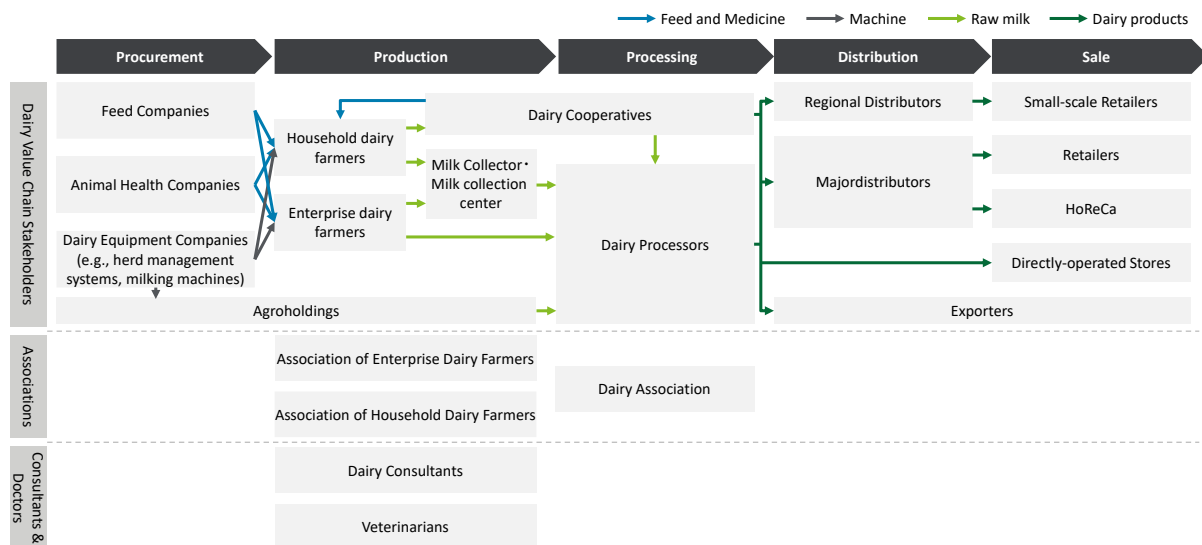
In the production stage, farmers supply the resulting raw milk to dairy processors, collection centers, or cooperatives.

This raw milk then moves to the processing stage, where it is transformed into various products such as fluid milk, yogurt, cheese, and butter, determining the final quality and variety.

In the subsequent distribution stage, regional or large-scale distributors purchase these goods from processors and supply them to retailers, serving as a vital link to the market.

Finally, at the sales stage, the products reach consumers through diverse channels, including small shops, supermarkets, hotels, restaurants, cafes, and processor-owned stores.

Additionally, while not directly part of this linear value chain, there are external support actors such as associations assisting dairy farmers and processors, dairy consultants supporting raw milk production, and veterinarians. By providing technical guidance and specialized services, these actors contribute to enhancing the overall efficiency and quality of the value chain. They play an indispensable role in strengthening its competitiveness from a supporting position.



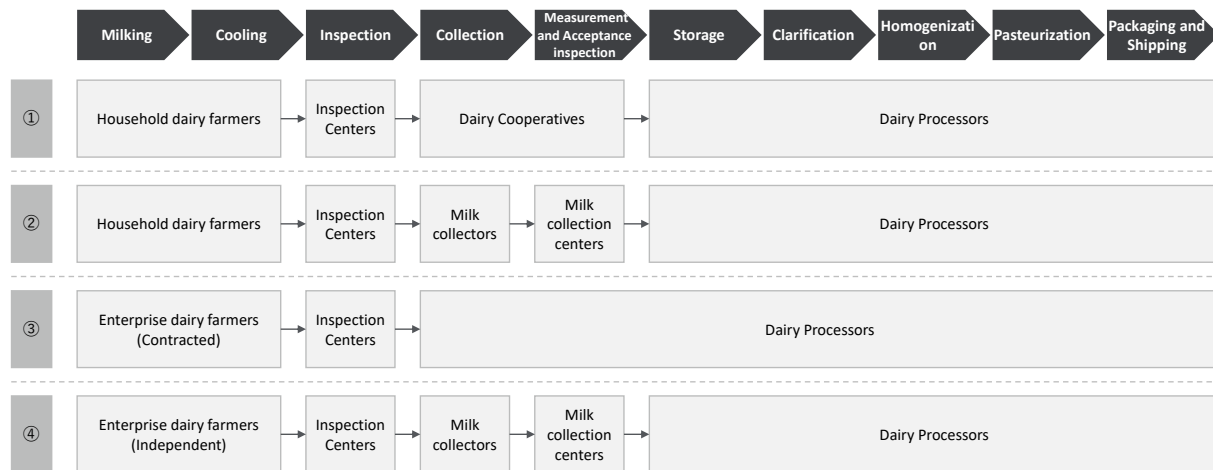
Source: JICA survey team

Figure4.3.1 Key Stakeholders

(2) Dairy Product Distribution Process

The process from raw milk to the shipment of final products consists of a sequential series of stages. This sequence commences with milking and proceeds through cooling, testing, collection, measurement and acceptance inspection, storage, clarification and homogenization, pasteurization, and packaging,

culminating in shipment¹⁴³¹⁴⁴. What is particularly noteworthy about this process is its variable structure: the actors responsible for specific stages, especially from collection to measurement and inspection, are not fixed. Their roles and responsibilities are contingent upon factors such as the operational model of the individual dairy farm, its membership status in a cooperative, or its contractual agreements with dairy processors¹⁴⁵.



Source: JICA survey team

Figure4.3.2 The Dairy Product Process: From Production to Shipment

4.3.2 Procurement

(1) Feed Companies

Ukraine's feed companies operate on a model of domestic sourcing and in-house production of raw materials, achieving an extremely high level of feed self-sufficiency¹⁴⁶. The resulting compound feed, concentrates, and feed additives are supplied through sales channels to individual dairy farmers and dairy cooperatives.

However, the invasion has profoundly disrupted the feed supply chain. Notably, power shortages stemming from attacks on energy infrastructure have forced feed mills to halt production lines, drastically reducing their operational capacity. While the deployment of generators as an alternative power source is progressing, soaring fuel prices are further inflating production costs, creating a vicious cycle. Furthermore, a critical shortage of male labor due to ongoing military mobilization—especially

¹⁴³ The Bull Vine. “Revolutionizing dairy exports: Ukraine's conversion to processing industry delivers 270% growth as raw material prices collapse”. 2025-06-04. <https://www.thebullvine.com/ja/news/revolutionizing-dairy-exports-how-ukraines-processing-pivot-delivers-270-growth-while-raw-commodities-crash/>, (Accessed 2025-08-21).

¹⁴⁴ MINISTRY OF AGRARIAN POLICY AND FOOD OF UKRAINE. “On Approval of the Requirements for the Safety and Quality of Milk and Dairy Products”. 2024-09-09. <https://zakon.rada.gov.ua/laws/show/z0593-19#Text>, (Accessed 2025-08-21).

¹⁴⁵ AMP. “Raw Milk Sample Logistics: Raw Milk Control Program in Ukraine”. 2025-04-23. <https://avm-ua.org/en/post/raw-milk-sample-logistics-raw-milk-control-program-in-ukraine>, (Accessed 2025-08-21).

¹⁴⁶ USDA. “Grain and Feed Annual-Ukraine 2025”. 2025-04-18. https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain%20and%20Feed%20Annual_Kyiv_Ukraine_UP2025-0010.pdf, (Accessed 2025-08-21).

the scarcity of skilled personnel like machine operators and production managers—is severely hampering production activities.

Table4.3.1 Key Feed Companies

Feed Companies	Sales (\$)	Feed productions	Feed supply			Head office
			Compound Feeds	Feed Ingredients (Concentrated feed, etc.)	Feed additives (Premix)	
UKRAINSKE ZERNO TOV	49M	In-house production of wheat, rye, soybeans, soybean meal, sunflower seeds, etc.	○			Ukraine
TROUW NUTRITION UKRAINE LLC	45M	(Unknown)	○			Netherlands
KOUDIJS UKRAINE LLC	34M	In-house production of feed additives, etc.	○	○	○	Netherlands
KARHILL ENIMAL NUTRISHN TOV (Cargill Ukraine)	29M	In-house production of wheat, barley, corn, sunflower seeds, rapeseed, etc.	○	○	○	America
ZAVOD KYIVKOMBIKORM TOV (Dnipro Agro)	25M	In-house production of wheat, barley, sunflower seeds, rapeseed, etc.	○	○		Cyprus
AGROVET PRODUCTION LLC (AVA Group)	22M	(Sourced from domestic farms—no in-house production)	○		○	Ukraine
MEGA FEED LLC	17M	(Sourced from domestic farms—no in-house production)	○		○	Ukraine
ABM-TRADE LTD LLC	12M	In-house production	○	○	○	Ukraine
FEEDNOVA LLC	11M	In-house production		○		Ukraine
VITAHRO NUTRYSYHN TOV (Vitagro Nutrition)	9M	(Sourced from domestic farms—no in-house production)	○	○	○	Ukraine

Source: JICA survey team based on D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>). Key feed companies are defined as the top 10 companies by sales revenue. Feed supply information is based on data from each company's official website UKRAINSKE ZERNO TOV (<https://ukrainske-zerno.com/>), TROUW NUTRITION UKRAINE LLC (<https://www.trouwnutrition.ua/uk-ua/>), KOUDIJS UKRAINE LLC (<https://www.koudijs.com/eu/>), KARHILL ENIMAL NUTRISHN TOV (<https://www.cargill.com/worldwide/ukraine>), ZAVOD KYIVKOMBIKORM TOV (<https://dniproagro.com/en/about-the-company/>), AGROVET PRODUCTION LLC (<https://avagroup.ua/en/>), MEGA FEED LLC (<https://megakorm.com/eng>), ABM-TRADE LTD LLC (<https://abm.com.ua/en>), FEEDNOVA LLC (<https://feednova.com.ua/en/>), VITAHRO NUTRYSYHN TOV (<https://www.vitagronutrition.com.ua/en/>)

(2) Animal Health Companies

A number of Animal Health Companies are operational within Ukraine, fulfilling a critical role in supporting the foundation of the nation's livestock sector. These companies supply a wide array of products, including vaccines, antibiotics, and vitamin supplements, catering not only to the dairy industry but also to a diverse range of animal species such as poultry and swine. Their business models are also varied: some companies engage in direct sales to farms and offer specialized technical support, while others also function as distributors, possessing extensive domestic and international distribution networks.

Table4.3.2 Key Animal Health Companies

Animal Health Companies	Sales (\$)	Role	Products			Head office
			Preventive drugs (Vaccines and anthelmintic drugs)	Therapeutics (Antibiotics and sedatives)	Nutritional supplements (Vitamins and minerals)	
Arterium	126.05M	Production & Sales of Pharmaceuticals (Human & Veterinary)		○		Ukraine
UkrVetPromPostach	11.46M	Veterinary Hospitals & Production/Sales of Veterinary Medicines		○	○	Ukraine
BioTestLab	8.27M	Production & Sales of Veterinary Medicines	○	○	○	Ukraine
Eurovet	7.62M	Distributor (Imported Products)	○	○	○	Ukraine
Brovapharma	6.68M	Production & Sales of Veterinary Medicines	○	○	○	Ukraine
Vetsintez	5.82M	Production & Sales of Veterinary Medicines	○			Ukraine
Invet UA	4.35M	Distributor (Domestic & Imported Products)	○	○		Ukraine
Vetagro	0.93M	Distributor (Domestic & Imported Products)	○	○	○	Ukraine
Fenix Agro	0.83M	Production & Sales of Veterinary Medicines	○		○	Ukraine
Biopharm	0.55M	Production & Sales of Veterinary Medicines	○	○	○	Ukraine

Source: JICA survey team based on D&B Hoovers (<https://www.dnb.com/en-us/products/dnb-hoovers.html>). Key Animal Health Companies are defined as the top 10 companies by sales revenue. Products information is based on data from each company's official website. Arterium (<https://www.arterium.ua/en>), UkrVetPromPostach (<https://www.vetsnab.com.ua/en/>), BioTestLab (<https://www.biotestlab.ua/en>), Eurovet (<https://eurovet.com.ua/en/>), Brovapharma (<https://brovapharma.com/>), Vetsintez (<https://vetsintez.com/en>), Invet UA (<https://www.invet.ua/>), Vetagro (<https://vetagro.com.ua/en/main/>), Fenix Agro (<https://fenix-agro.com/en>), Biopharm (<https://biopharma.ua/en>)

(3) Dairy Equipment Companies

The Ukrainian dairy equipment market is dominated by European brands, with leading companies offering a comprehensive portfolio ranging from milking machines and herd management systems to feeding equipment and various sensors. Meanwhile, domestic startups are gaining prominence, advancing the development of products that incorporate cutting-edge technologies like smart collars—neck-mounted wearable devices for monitoring cattle health—and feed sensors. These emerging firms are creating a new wave of innovation, leveraging IoT and data analytics to enhance the efficiency and advancement of dairy farm operations.

Table4.3.3 Key Dairy Equipment Companies

Dairy Equipment Companies	Sales (\$)	Company Overview	Company Type	Head office
Tetra Laval (DeLaval, Tetra Pak)	16.6B	Milking machines, Refrigeration equipment, Herd management systems, dairy processing machinery, etc.	Major Food Processing, Packaging, and Distribution Company	Switzerland
Zoetis (Smartbow)	8.5B	Smart ear tags, Herd management systems, etc.	Animal Health Company	America
GEA	5.9B	Milking machines, Feeding robots, Smart collars, Herd management systems, etc.	Major Food Machinery Company	Germany
Nedap	382.7M	Milking machines, Smart collars, Herd management systems, etc.	Major dairy machinery company	Netherlands
Milkrite InterPuls	21.7M	Milking machines, Storage tanks, Quality confirmation machines, Herd management systems, etc.	Major dairy machinery company	United Kingdom
Afimilk	8.3M	Smart collar, Feeding monitoring, Herd management system, etc.	Major dairy machinery company	Israel
UNIFORM-Agri	3.8M	Herd management system, etc.	Major dairy machinery company	Netherlands
IKR Group	1.7M	Milking machines, Storage tanks, Dairy processing machinery, etc.	Distributor (with own products)	Ukraine
HowCow	371K	Smart Collar:Monitoring cattle health and productivity using AI	Dairy Startups	Ukraine
ProFeed	126K	Feed sensors:Monitoring the mixing, delivery, and intake of feed	Dairy Startups	Ukraine
WinMixSoft	-	Feed design tools:Formulating optimal rations tailored to each individual cow's nutritional requirements	Dairy Startups	Ukraine

Source: JICA survey team based on Agronomy Research 「Optimisation of dairy farming in Ukraine: Integrating modern information technologies for genetic improvement and sustainable herd management」 (https://sulawe.org/wp-content/uploads/2025/03/ar2025_005_matvieiev_v_tava_doi_010.pdf). Sales data from D&B Hoovers; company overviews, corporate structures, and head office information from respective corporate websites. Dairy equipment companies were identified based on the machinery showcased on Enterprise dairy farm websites. Tetra Laval (<https://www.tetralaval.com/>), Zoetis (<https://www2.zoetis.com.ua/>), GEA (<https://www.gea.com/en/ukraine/>), Nedap (<https://www.nedapidentification.com/distributors/>), Milkrite IterPuls (<https://www.milkrite-interpuls.es/donde-operamos>), Afimilk (<https://www.afimilk.com/%D1%85%D1%96%D1%96-international-dairy-congress/>), UNIFORM-Agri (<https://www.uniform-agri.com.ua/>), IKR Group (https://ikrtech.com.ua/ua/?srsltid=AfmBOopFmo7QVbuqWCREwVp65GT9leSPHQiC4QN0jG_nv8FYFHyQR_), HowCow (<https://howcow.tech/>), ProFeed (<https://profeed.systems/>), WinMixSoft (https://tracxn.com/d/companies/winmix-soft/fmHkRrfjG820it_myB1ws6caaCrUizh5ixNrYZpJdyI).

4.3.3 Production

(1) Agroholdings

Agroholdings in Ukraine are characterized by a business model centered on the efficient production of multiple crops, leveraging vast tracts of agricultural land. For those also engaged in raw milk production, vertical integration is a common practice; they utilize by-products from their own grain cultivation as livestock feed to achieve both cost reduction and resource circulation. Furthermore, these entities exhibit a strong tendency to proactively adopt the latest agricultural technologies and equipment, aiming to enhance productivity and enforce rigorous quality control. As major players in the export of agricultural products to both domestic and international markets, these Agroholdings contribute significantly to the Ukrainian economy.

Table4.3.4 Key Agroholdings

Agroholdings	Production Area (1,000 ha)	Productions					Processing
		Grains (feed)	Vegetables	Fruits	Raw milk	Other Ingredients	
Kernel	600	○	–	–	–	–	Oil
UkrLandFarming	570	○	–	–	○	○ (Beef Cattle, Eggs)	–
NCH	410	○	–	–	–	–	–
MHP	366	○	○ (Potatoes, Carrots, Onions)	–	–	○ (Chicken, Beef cattle)	Chicken processed products
Astarta	248	○	–	–	○ (29,000 heads)	–	Sugar
Miriya Agro Holdings	165	○	○ (Potato)	–	–	–	–
IMC	137	○	–	–	○	–	–
Agroton	122	○	–	–	○ (4,500 heads)	○ (Chicken, Pig)	Bread, Cheese
Ukrprominvest-Agro	120	○	–	–	○ (3,000 heads)	○ (Beef cattle, Pigs)	Sugar
AgroGeneration	120	○	–	–	–	○ (Beef cattle)	–

Source: JICA survey team based on AgroPortal 「Top 10 agricultural holdings of Ukraine. Main highlights in infographics」 (<https://agroportal.ua/publishing/infografika/top10-agrokholdingov-ukrainy-aktsenty-2017-v-infografike>). Kernel (<https://www.kernel-brand.com/>), UkrLandFarming (<https://www.ulf.com.ua/en/>), NCH (<https://nchcapital.com/>), MHP (<https://mhp.com.ua/en/glorietoUkraine>), Astarta (<https://astartaholding.com/en/>), Miriya Agro Holdings (<https://www.linkedin.com/company/mriyaagroholding/>), IMC (<https://www.imcagro.com.ua/en/home>), Agroton (<https://www.agroton.com.ua/en/>), Ukrprominvest-Agro (<https://upi-agro.eu/>), AgroGeneration (<https://agrogeneration.com/>)

(2) Enterprise dairy farmers

Enterprise dairy farms in Ukraine can be broadly categorized into two main types based on their operational structure: the first consists of small and medium-sized farms operating with legacy Soviet-era equipment, while the second comprises large-scale, modernized farms that have secured stable contracts with major dairy processors.

Furthermore, these large-scale Enterprise farms tend to be self-sufficient in feed production and supply their raw milk directly to dairy manufacturers.

Table4.3.5 Classification and Characteristics of Enterprise Dairy Farms

	Small and medium-sized farms	Large-scale farms
Farm size	Less than 500 heads/farm	More than 500 heads/farm
Number of farms	1,108 farms (approx. 85%)*	201 Farm (approx. 15%)*
Raw milk supplier	Milk Collection Centers and Dairy Cooperatives	Contracted Dairy Processors
Production Equipment	Relies on legacy Soviet-era equipment Outdated equipment, such as milking machines and pipelines, indicates a lack of modernization. This leads to a heavy reliance on manual labor, which hinders efficiency and productivity.	Utilizes modern Western equipment The latest technologies and equipment, including robotic milking systems and herd health management systems, are implemented with funding from contracted dairy companies.
Raw milk quality	Relatively low Inadequate sanitation practices and animal husbandry can lead to lower quality raw milk.	Relatively high Well-managed hygiene and housing environments enable the consistent production of high-quality raw milk. Additionally, rigorous quality control is implemented to ensure compliance with the standards set by dairy processors.

Source: JICA survey team based on State Statistics Service of Ukraine, Dairy Global [Challenges at a Ukrainian dairy farm near the frontline - Dairy Global](#), Bulgarian Journal of Agricultural Science [Main trends of dairy industry in Ukraine](#), The Ministry of Agrarian Policy and Food Vitaliy Koval: [Today, 125 dairy farms are being built or modernized in Ukraine](#). *For this analysis, farms are provisionally classified into two categories: "Small and medium-sized farms" (less than 500 heads) and "Large scale farms" (more than 500 heads). The number of farms in each category was then identified based on 2023 data on farm counts by size from the State Statistics Service of Ukraine.

Table4.3.6 Key Enterprise dairy farmers

Enterprise dairy farmers	Milk Yield (1 head/year)	Heads	Number of farms	Feed Source	Raw milk supplier
Progress Ltd.	11,764kg	2,200	2	Partially self-sufficient (corn silage and haylage)	(Unknown)
Ukraina Ltd. (LLC UKRAINE)	11,729kg	2,800	1	(It is assumed that they are partially self-sufficient in feed, given that they are also engaged in grain and oilseed production.)	(Unknown)
Promin LLAGC	11,360kg	8,600	1	Almost 100% self-sufficient (produces 30 types of feed)	Supply to dairy manufacturers (Rouveen Kaasspecialiteiten)
Agroco AgLtd	11,334kg	3,500	2	(Unknown)	(Unknown)
LLC Agrofirma Pischanska	11,023kg	2,000	1	Partly self-sufficient	Supply to a dairy manufacturer (Danone Ukraine)
Agrofirma Promin	11,006kg	450	1	(Unknown)	(Unknown)
Agroservice Ltd.	10,818kg	(Unknown)	(Unknown)	(Unknown)	(Unknown)
Veleten Ltd.	10,664kg	2,200	1	(Unknown)	(Unknown)
Agroprodservice PAC	10,400kg	1,006	1	(It is assumed that they are partially self-sufficient in feed, given that they are also engaged in grain and oilseed production.)	Supply to dairy manufacturers (Ternopilsky Molokozavod)
PAC AF Goryn	10,350kg	2,557	1	(Unknown)	(Unknown)

Source: JICA survey team based on Association of Dairy Producers of Ukraine 「TOP-10 dairy farms in Ukraine」 (<https://avm-ua.org/uk/post/top-10-molocnih-ferm-ukraini?milkua=1>) The term "Key Enterprise dairy farms" refers to the top 10 companies ranked by milk yield per cow. Information other than milk yield was sourced from the respective company websites and the "Ukrainian farms" section on MilkUA.info (<https://milkua.info/en/post/section/ukrainian-farms>). Progress Ltd. (<https://milkua.info/en/post/progress-ltd-volyn>), Ukraina Ltd. (<https://landlord.ua/wp-content/page/ukraina-yaku-stvoryv-oleh-kryzhovachuk/>), Promin LLAGC (<https://milkua.info/en/post/promin-llagc>), Agroco AgLtd. (<https://milkua.info/uk/post/top-10-molocnih-ferm-ukraini-stov-agroko>), LLC Agrofirma Pischanska (<https://milkua.info/uk/post/toy-agrofirma-piscanska>), Agrofirma Promin (<https://milkua.info/uk/post/top-10-molocnih-ferm-ukraini-pp-agrofirma-promin>), Veleten Ltd. (<https://milkua.info/en/post/veleten-ltd>), Agroprodservice PAC (<https://agroprodservice.com.ua/en/>), PAC AF Goryn (<https://milkua.info/uk/post/psp-agrofirma-gorin>)

(3) Household dairy farmers

In contrast to Enterprise dairy farmers, Household dairy farmers in Ukraine possess limited agricultural land, making self-production of feed challenging. Consequently, they rely heavily on external procurement, purchasing it from sources such as feed companies and dairy cooperatives. The sales channels for their raw milk are also distinctive. As of 2021, their supply to major dairy processors accounted for only about 12% of their total production. The vast majority of the remainder is distributed through local channels, including for self-consumption, sales to small retail shops, and direct sales to neighbors. This distribution pattern is often attributed to the underlying challenge that the quality of the raw milk produced does not consistently meet the stringent standards required by large-scale processors.

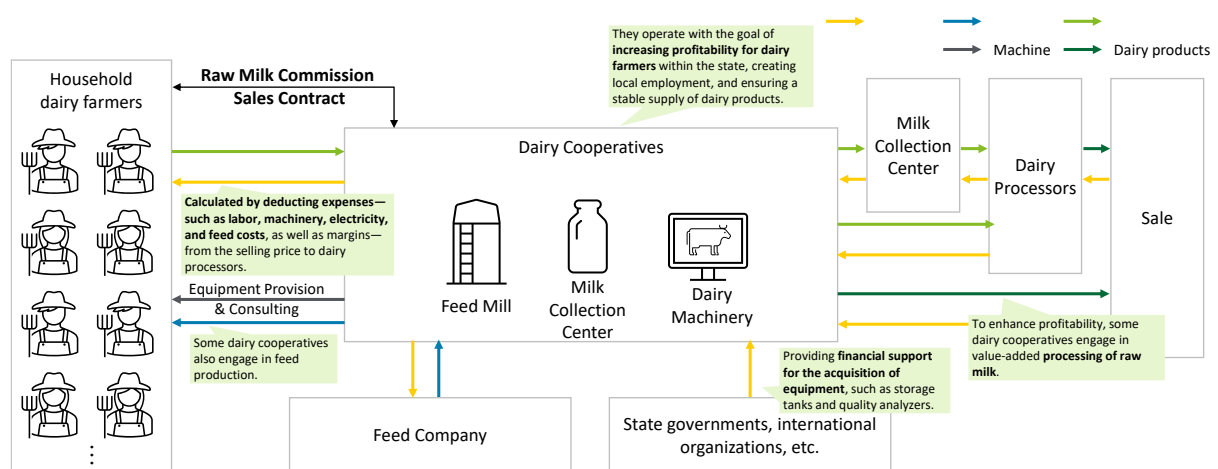
(4) Dairy Cooperatives

Dairy cooperatives carry out a wide range of activities with the aim of improving the economic benefits of their member dairy farmers. These cooperatives are particularly concentrated in western Ukraine, resulting in a regional imbalance. In Ukraine, dairy cooperatives can be broadly classified into two types: production cooperatives and service cooperatives.

Production cooperatives mainly provide support such as supplying production materials (equipment and feed) and offering management consulting. They also play an important role in aggregating raw milk from small household dairy farms and selling it collectively to dairy manufacturers. In addition,

some production cooperatives have their own processing facilities, allowing them to manufacture and sell dairy products directly. This reduces the burden of distribution and sales for dairy farmers and enables them to secure stable profits.

On the other hand, service cooperatives limit their activities to supplying production materials (equipment and feed) and providing management consulting, without engaging in raw milk aggregation or sales to dairy manufacturers. As a result, member dairy farmers have the flexibility to freely choose their own sales channels for raw milk. As of 2024, there are 67 service cooperatives¹⁴⁷ in the dairy sector. This is higher compared to 55 cooperatives in the fruit and berry sector, 25 in the vegetable sector, and 19 in the grain sector, indicating that the dairy sector has a greater tendency towards cooperative formation than other agricultural sectors.



Source: JICA survey team (A list of dairy cooperatives identified through desktop research)

Figure4.3.3 The Dairy Product Process: From Production to Shipment

Table4.3.7 Key Dairy Cooperatives

¹⁴⁷ MINISTRY OF AGRARIAN POLICY AND FOOD OF UKRAINE UKRAINIAN, SCIENTIFIC RESEARCH INSTITUTE OF PRODUCTIVITY OF THE AGRO-INDUSTRIAL COMPLEX. "Results of the activities of agricultural service cooperatives". [rezultati-dijalnosti-silskogospodarskih-obslugovujuchih-kooperativiv-stanom-na-1-sichnja-2024-roku.pdf](#). (Accessed 2026-01-06).

Dairy Cooperative	Number of farms	Head count	Production volume	Feed production and supply	Raw milk supply	Processing	Region
Pokrova Cooperative	300	—	—	—	Dairy Processors	—	Western Region (Lviv Oblast)
Dobrobut Andriivky Cooperative	145	6-24 heads/farm	6ton/day	—	Dairy Processors	—	Central Eastern Region (Dnipropetrovsk Oblast) South (Zaporizhzhia Oblast)
Avangard Cooperative	57	A total of 267 heads	2.5-3ton/day	Produces and sells feed directly to its member farmers	Dairy Processors (Lactalis)	—	Southern Region (Mykolaiv Oblast)
Veselka-2020 Cooperative	50	—	—	—	Dairy Processors (Moloko-Kraina)	—	Central Eastern Region (Poltava Oblast)
Ecom Cooperative	43	5-10 heads/farm	400L/day	—	Processing is carried out within the cooperative	Processes raw milk into value-added products, such as cheese and sour cream, for sale	Western Region (Ivano-Frankivsk Oblast)
Molokodar Cooperative	32	—	200L/day	—	Dairy Processors	—	Western Region (Lviv Oblast)
—	9	—	—	Purchases feed from third-party suppliers for resale to its member farmers	Dairy Processors	—	Central Eastern Region (Dnipropetrovsk Oblast)
Natural Milk Cooperative	—	—	—	Produces and sells feed directly to its member farmers	Dairy Processors (Ukrmilinvest)	—	Western Region (Lviv Oblast)
Podilska Nadiya Cooperative	—	—	4ton/day	—	Dairy Processors	—	Central-Western (Vinnytsia Oblast)
—	—	—	—	—	Dairy Processors	Performs primary processing on raw milk before selling it to dairy processors	Western (Lviv Oblast)

Source: JICA survey team based on Pokrova Cooperative (<https://ecoaction.org.ua/wp-content/uploads/2017/09/Ukraine.-Karpatske-Kolo.-Local-action-groups-in-Western-Ukraine.pdf>), Pokrova Cooperative (<https://decentralization.ua/news/13359>), Dobrobut Andriivky Cooperative (<https://decentralization.ua/uploads/library/file/315/Success-stories-DOBRE.pdf>), Avangard Cooperative (<https://www.dtnpf.com/agriculture/web/ag/news/farm-life/article/2023/08/01/restoring-ukrainian-dairy-co-op-take>), Veselka-2020 Cooperative (<https://milkua.info/uk/post/na-poltavsini-molochnij-kooperativ-obednue-50-gospodarstv>), Ecom Cooperative (<https://tuca.com.ua/en/ecom-cooperative-chesnykivskyi-cheese/>), Ecom Cooperative (<https://shotam.info/na-prykarpatti-seliany-zarobliaiut-u-molochnomu-kooperatyvi-yak-im-tse-vdalos/>), Molokodar Cooperative (<https://kurkul.com/interview/849-bogdan-zeleniy-diyeviy-sposib-ojiviti-selo--stvoriti-molochnij-kooperativ>), Dairy cooperative in the seventh row of the table (<https://ecoaction.org.ua/wp-content/uploads/2017/09/Ukraine.-Karpatske-Kolo.-Local-action-groups-in-Western-Ukraine.pdf>), Natural Milk Cooperative (<https://agrotimes.ua/tvarinnitstvo/rivnenskyj-molochnyj-kooperativ-trydbaye-kombikormovu-liniyu-za-grant-vid-proon/>), Podilska Nadiya Cooperative (<https://kurkul.com/news/6888-na-vinnichchini-vidkrili-obslugovyuchiy-kooperativ-podilska-nadiya>), Dairy cooperative in the tenth row of the table (<https://suspilne.media/lviv/531991-na-lvivsini-stvorili-kooperativnij-molokoperobnij-zavod-koli-vin-zapracue/>)

4.3.4 Processing

(1) Dairy Processors

The prevailing business model for major dairy processors in Ukraine is to produce dairy products by procuring raw milk from contract farms and collection centers, rather than directly owning their own agricultural operations.

Table 4.3.8 Key Dairy Processors

Dairy Processors	Market Size (2024)		Products						Raw milk suppliers	Head office
	Sales* (UAH Million)	Market Share	Milk	Yogurt	Cream	Butter	Cheese	Dried milk		
Molochny Alliance (Milk Alliance)	9,609	8.6%	○	○	○	○	○	○	Contract Farm	Ukraine
Terra Food	8,826	7.9%	○	○	○	○	○	-	Contract Farm	Ukraine
Lactalis Ukraine	8,826	7.9%	○	○	○	○	○	-	63 contract farms and 40 milk collection centers	France
Continuum Holding (Galynchyna, Cheese Club)	5,922	5.3%	○	○	○	○	○	-	(Unknown)	Ukraine
Lustdorf (Loostdorf)	4,022	3.6%	○	○	○	○	-	-	More than 50 contract farms	Ukraine
Ternopilsky Molokozavod (Molokija)	3,352	3.0%	○	○	○	○	-	○	Contract Farm	Ukraine
PepsiCo Ukraine	3,240	2.9%	○	○	○	-	○	-	16 contract farms and 12 milk collection centers	America
Danone Ukraine	2,793	2.5%	○	○	○	-	○	-	Contract Farm	France
Schedro TM	2,793	2.5%	-	-	-	○	-	-	(Unknown)	Ukraine
Monteforte Holding Ltd	2,123	1.9%	Unknown						(Unknown)	Ukraine
Prydniprovsky (Zlagoda, Lyunbimchik)	1,899	1.7%	○	○	-	-	○	-	(Unknown)	Ukraine
Ukrproduct Group	1,452	1.3%	-	-	-	○	○	-	(Unknown)	Ukraine
Hochland Ukraine	1,341	1.2%	-	-	-	-	○	-	(Unknown)	Germany
Savencia Ukraine	1,341	1.2%	-	-	-	-	○	-	(Unknown)	France
Milkiland	1,341	1.2%	○	○	○	○	○	○	7 Contract Farms	Ukraine
Bilotserkivska Agropromyslova Grupa	1,229	1.1%	-	-	-	○	○	○	(Unknown)	Ukraine
Yuriya (Voloshkove Pole)	1,229	1.1%	○	-	-	○	○	○	Contract Farm	Ukraine

Source: JICA survey team based on Euromonitor (<https://www.euromonitor.com/>) (Major dairy companies are defined as enterprises holding a market share of 1% or more. Information regarding products, raw milk sourcing, and headquarters locations was obtained from each company's official website.) Molochny Alliance (<https://www.milkalliance.cy/>), Terra Food (<https://terrafood.ua/en/>), Lactalis Ukraine (<https://lactalis.com.ua/>), Continuum Holding (https://dosye.info/Continuum_Group_Ukraine), Lustdorf (<https://www.loostdorf.com/>), Ternopilsky Molokozavod (<https://www.molokija.com/>), PepsiCo Ukraine (<https://www.pepsico.ua/>), Danone Ukraine (https://danone.ua/about-company/?no_cache=1&L=1), Schedro TM (<https://en.schedro.ua/>), Prydniprovsky (<https://pet-eu.com/news/zlagoda-and-trends/>), Ukrproduct Group (<https://ukrproduct.com/en/>), Hochland Ukraine (<https://www.hochland-group.com/en/index.htm>), Savencia Ukraine (<https://www.savencia.com/en>), Milkiland (<https://www.milkiland.ua/en/>), Bilotserkivska Agropromyslova Grupa (<https://bilotserkivske.com/uk>), Yuriya (<https://dairy-vp.com/>)

* The sales figures for individual companies were estimated based on total industry sales and market share data, the latter of which was available only to two decimal places. As a result, some companies are shown with identical sales figures.

To secure the necessary quantity and quality of raw milk, these companies actively invest in the establishment and modernization of their partner farms. According to the Ministry of Agrarian Policy and Food, 125 farms were undergoing new construction or modernization as of June 2025¹⁴⁸, a trend particularly evident in the western and central-western regions. This movement is exemplified by Danone Ukraine, which, in partnership with ICF Community Wellbeing (an NPO/NGO supporting Household farmers within agricultural cooperatives), co-funded a UAH 245 million (€4.9 million) initiative. This investment supported new farm construction, the renovation of existing facilities, the introduction of modern dairy equipment, and the promotion of cooperative formation, ultimately contributing to increased income for 3,508 dairy farmers.

Table 4.3.9 Example of a Modernized Farm

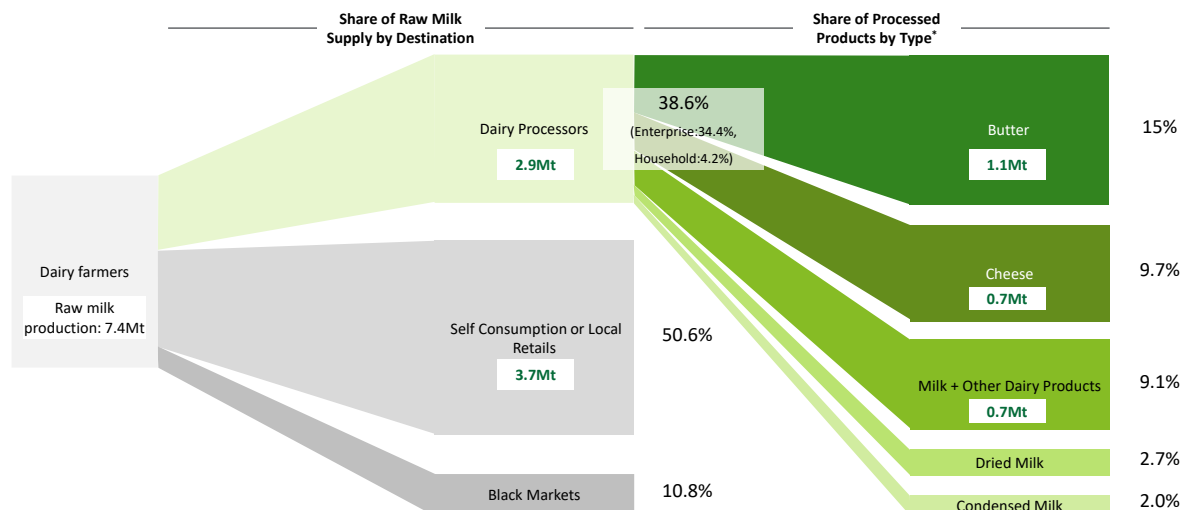
	Herd size	Region
Ukrainian Milk Company (Ukrainian Dairy Processors)	4,000 heads (Newly constructed along with a biogas plant and a feed mill)	Western Region
Ukraine2001 (Ukrainian Dairy Processors)	2,000 heads (Refurbished)	Central-Western Region (Khmelnitskyi Oblast)
Mukko Milk (Polish Dairy Processors)	2,000 heads (New)	Western Region (Lviv Oblast)
Moloko Vitychyn (Ukrainian Dairy Processors)	1,500 heads (New)	Western Region (Rivne Oblast)
Villa Group (Ukrainian AgroHoldings)	(New)	Western Region

Source: JICA survey team based on State Statistics Service of Ukraine (<https://stat.gov.ua/index.php/en/topics/agriculture-forestry-and-fisheries>)

¹⁴⁸ Ministry of Agrarian Policy and Food of Ukraine. "Vitaliy Koval: Today, 125 dairy farms are being built or modernized in Ukraine". 2025-06-03. <https://minagro.gov.ua/news/vitalii-koval-sohodni-v-ukraini-buduetsia-abo-modernizuietsia-125-molochnykh-ferm>, (Accessed 2025-08-21).

Despite these processor-led initiatives, the reality is that milk formally processed by dairy companies accounts for only 38.6% of the nation's total raw milk output. A significant portion is distributed through informal channels, with 50.6% allocated to self-consumption or local retail and 10.8% flowing through the black market^{149,150}.

For the milk that is formally processed, the product breakdown is as follows: butter (15%), cheese (9.7%), fluid milk and other dairy products (9.1%), powdered milk (2.7%), and condensed milk (2.0%).



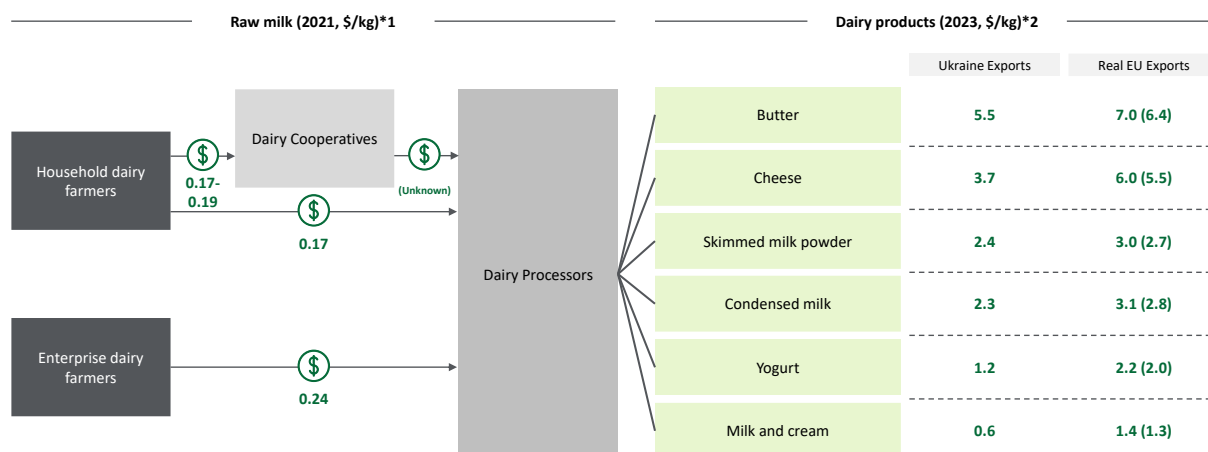
Source: JICA survey team *The required raw milk volume was calculated from the production volume of each dairy product. The conversion factors were sourced from J-milk's publication, ([findNEW: Knowledge of Milk and Dairy Products](#))

Figure 4.3.4 Distribution of Raw Milk between Supply and Processing

The procurement price for raw milk is tiered according to its quality. Milk from Enterprise farmers typically commands a higher price, as it is generally of better quality than that from Household farmers. However, even family-run farms can secure more favorable prices if their product quality is guaranteed through a cooperative. In conclusion, while value is certainly being added through current processing activities, analysis indicates that there remains significant potential for further value enhancement by elevating quality standards, particularly when benchmarked against those of the European Union.

¹⁴⁹ AMP. "The update of the Ukraine Dairy Map-2024 infographic dedicated to the World Milk Day". 2024-06-01. <https://avm-ua.org/en/post/the-update-of-the-ukraine-dairy-map-2024-infographic-dedicated-to-the-world-milk-day>, (Accessed 2025-08-21).

¹⁵⁰ LVVN Attaché Network. "Agribusiness of Ukraine Infographic report 2023/24". 2025-02-18. <https://www.agroberichtenbuitenland.nl/documenten/publicaties/2025/02/17/agribusiness-of-ukraine-2023-2024>, (Accessed 2025-08-21).



Source: JICA survey team based on AgroPortal 「Dairy cooperative in Dnipropetrovsk region enters processing」 (<https://agroportal.ua/konkurs/molochniy-kooperativ-na-chernigivshchini-zahodit-v-pererobku>), Decentralization 「We can do it!」 How peasants organized themselves into a dairy cooperative and began to live better lives」 (<https://decentralization.ua/news/13359>), World Bank 「World Integrated Trade Solution」 (<https://wits.worldbank.org/>), Economics 「Euro Area Consumer Price Index (CPI)」 (<https://tradingeconomics.com/euro-area/consumer-price-index-cpi>)

Figure4.3.5 Market Prices of Raw Milk and Dairy Products

4.3.5 Distribution

(1) Distributors

A distinguishing characteristic of dairy product distributors in Ukraine is their diversified product portfolio; they typically handle a wide array of food items, including fresh produce, rather than specializing exclusively in dairy. While some function as locally focused operators, the majority leverage extensive, nationwide logistics networks to extend their services beyond retail channels to also encompass the HoReCa (Hotels, Restaurants, Catering) sector.

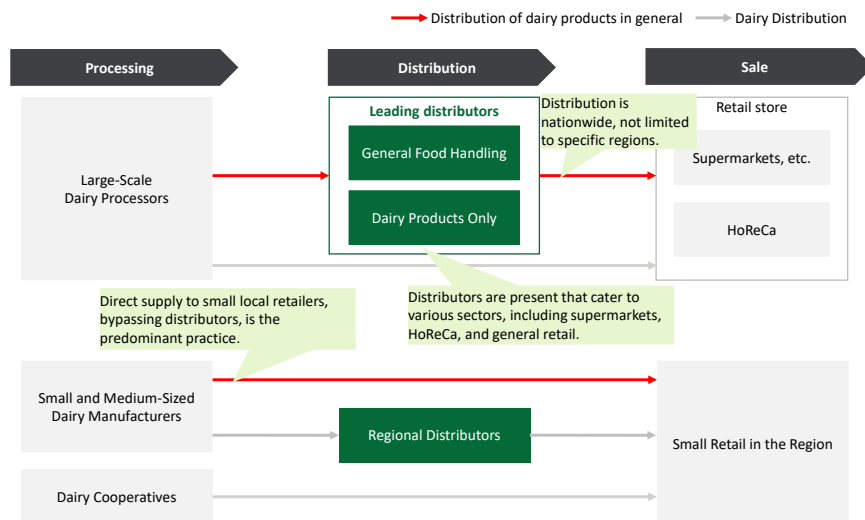
Table4.3.10 Distributors

Distributors	Domestic Sales (\$)	Processing	Foods and Products Handled				Wholesale destination		Head office	Supply area
			Vegetable	Berry	Dairy Products	Other	Supermarkets, etc.	HoReCa		
UkrCapital Trade	36M	○	-	-	○	○	unknown	unknown	Ukraine	Domestic & International (Europe, Asia, Africa, Middle East)
MOKOSHA	12M	-	-	-	○	-	○	○	Ukraine	Western Regions
LIKO	700K	-	○	-	○	○	○	-	Ukraine	All over the country
SMAKOVO UKRAINA	459K	-	○	○	○	○	-	○	Ukraine	Central Western Regions (Nationwide for all except fresh products)
FDMS UKRAINA	8.30K	-	-	○	○	○	○	-	Ukraine	unknown
BRINMI-HOREKA	2.94K	-	-	-	○	○	-	○	Ukraine	All over the country
PAN KOVBASCO	unknown	-	-	-	○	○	○	○	Ukraine	Western Regions West-Central Regions East-Central Regions
SOFIA TORG COMPANY	unknown	-	○	○	○	○	-	○	Ukraine	All over the country
ASCANIA FMCG	unknown	-	○	○	○	○	○	○	Ukraine	All over the country
Cityproducts	unknown	-	-	-	○	○	unknown	unknown	Ukraine	unknown

Source: JICA survey team based on UkrCapital Trade (<https://ukrcapital.trade/en/>), MOKOSHA (<https://mokosha-pb.biz-gid.com/>), LIKO (<https://milk-cheese.com.ua/en/>), SMAKOVO UKRAINA (<https://smakovo.com.ua/>), FDMS UKRAINA (<https://www.fdmsukraine.com/>), BRINMI-HOREKA (<https://bringme.ua/>), PAN KOVBASCO (<https://pankovbasko.com/>), SOFIA TORG COMPANY (<https://sofia-tc.com.ua/>), ASCANIA FMCG (<https://ascania-fmcg.com/en/>), Cityproducts

(<https://www.cityproducts.com.ua/>). This list includes distributors identified through desktop research. Revenue data is sourced from D&B Hoovers. (<https://www.dnb.com/en-us/products/dnb-hoovers.html>)

The distribution structure within the supply chain is consequently bifurcated, largely determined by the manufacturer's scale. Large-scale dairy manufacturers supply their products to retailers via these distributors, whereas small- to medium-sized manufacturers tend to engage in direct delivery to smaller, local retail outlets.



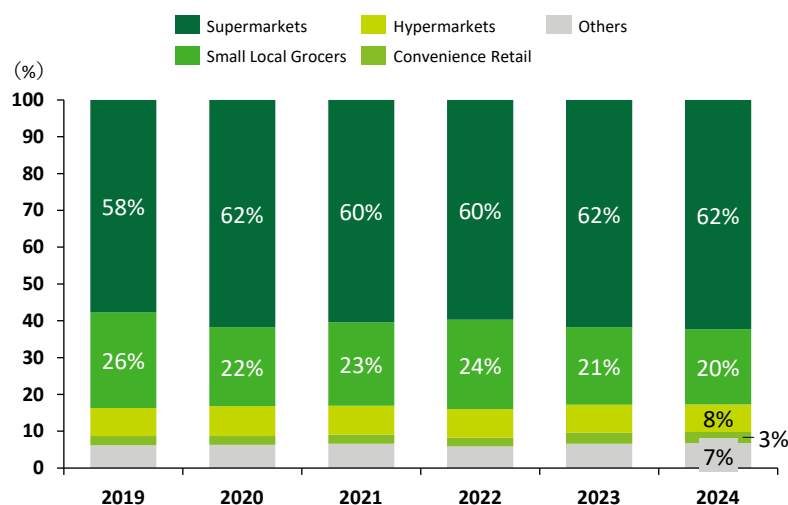
Source: JICA survey team based on Interview Survey

Figure4.3.6 Market Prices of Raw Milk and Dairy Products

4.3.6 Sale

(1) Supermarkets

In Ukraine, the primary sales channels for dairy products are supermarkets and small, local grocery stores, which collectively command a market share of approximately 80%. However, a gradual downward trend has been observed in the number of these latter, smaller establishments between 2019 and 2024.



Source: JICA survey team based on Euromonitor 「Retail Channels of Dairy Products and Alternatives (Ukraine)」 (<https://www.euromonitor.com/>)

Figure 4.3.7 Trend in Sales Channel Mix for Dairy Products

4.3.7 Other Stakeholders

(1) Association of Enterprise Dairy Farmers

The "Association of Milk Producers of Ukraine," which represents Enterprise dairy farmers, operates with the primary objective of enhancing the profitability of the entire dairy sector, placing a strong emphasis on improving milk quality. To this end, the association undertakes a range of initiatives, including supporting the adoption of best practices and providing technical guidance to farmers through its affiliated consulting center, which employs 50 specialists. Its activities also extend to lobbying government agencies and organizing industry events. The core of the association consists of 150 member dairy farms, collectively managing a herd of 76,000 head. Its organizational structure also encompasses affiliated bodies such as the "Dairy Center Kischenzi," a laboratory responsible for milk and feed quality analysis, and "Uman Labs," a dedicated farmer training center. Demonstrating its considerable influence, these 150 member farms alone account for approximately 20% of Ukraine's total raw milk production¹⁵¹.

(2) Association of Household Dairy Farmers

"Family Dairy Farms (FDF)" is an association for family-run dairy farms, spearheaded by Ukrmilkinvest, a dairy processor, and the Ukrainian Coop Federation, an organization that facilitates cooperative formation for family farmers. It unites over 300 Household dairy farmers, who collectively manage a herd of more than 3,500 head. The association's stated objectives are multifaceted: to develop and support Household farmers in producing high-quality raw milk and dairy products, create rural employment, provide high-quality dairy goods, sustain local communities, and promote the consumption of domestic products. These activities are financed by investments from over 760 diverse domestic and international stakeholders, including the governments of Sweden and Canada, the United Nations Development Programme (UNDP), dairy processors, banks, and private investors. Leveraging this capital, FDF offers a comprehensive program to its member farmers, encompassing financing, consulting, technical guidance, and support for establishing cooperatives¹⁵².

(3) Dairy Association

"The Union of Dairy Enterprises of Ukraine" is a key industry association committed to the sustainable development of the domestic dairy sector. Its primary functions involve safeguarding the interests of its member companies, formulating and promoting development strategies to strengthen the industry's overall competitiveness, and improving the regulatory and institutional framework. Specific activities include financing the modernization of dairy processors and developing programs that support their growth. The association's membership comprises 46 major dairy processors, which collectively account for approximately 70% of the country's total processed dairy volume, in addition to educational

¹⁵¹ Association of Milk Producers of Ukraine. "Official Website". <https://avm-ua.org/en>, (Accessed 2025-08-21).

¹⁵² Family Dairy Farms. "Official Website" <https://smf.org.ua/en/golovna-2/>, (Accessed 2025-08-21).

institutions in the agriculture and food sectors¹⁵³.

(4) Dairy Consultants

Ukraine's dairy sector is supported by two primary consulting bodies with distinct areas of expertise. The first is the Consulting Center of the Association of Milk Producers of Ukraine (ABM CC), which aims to enhance the profitability of domestic dairy farms and strengthen the international competitiveness of the Ukrainian dairy industry. Its team of over 85 specialists, operating across nine regions, provides comprehensive management guidance to more than 130 dairy farms, covering everything from reducing milk production costs and improving productivity to optimizing herd management and enhancing cattle health and fertility¹⁵⁴.

The second is the Ukrainian Holstein Association, dedicated to the genetic improvement and elevation of the Ukrainian Holstein breed's status. This organization operates through a collaborative framework where multiple specialized entities assume distinct roles. Its overarching functions include selecting optimal genetic resources for individual farms, issuing internationally compliant pedigree certificates, and supporting the development of a legislative framework conducive to genetic advancement. Within this structure, DGE, a livestock consultancy, supplies breeding animals and provides consulting; ABM, the farmer association, supports farmers through its ABM CC; the feed company DK FEED facilitates the adoption of high-quality feed; and DK VET supplies veterinary medicines required by ABM's consultants and others¹⁵⁵.

4.4 Challenges and Opportunities

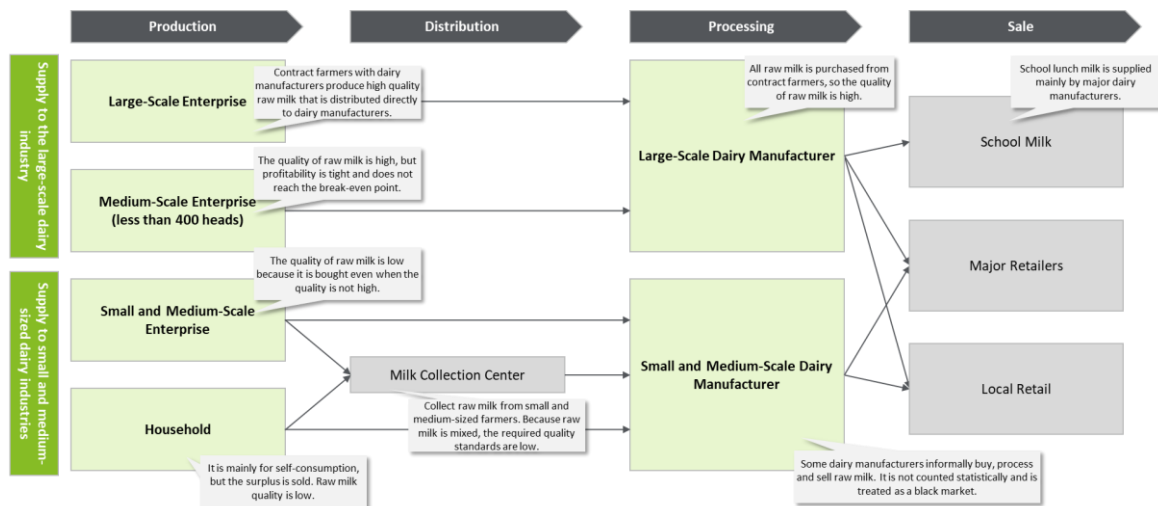
4.4.1 Challenges and Strategies in Production

Raw milk production in Ukraine's dairy sector features a diverse structure depending on farm size and supply destination. Specifically, farms can be categorized into large-scale enterprise farms, medium-scale enterprise farms (with fewer than 400 cows), small and medium-scale enterprise farms, and household farms. Each category faces distinct challenges, making it necessary to identify the current situation, key issues, and response policies for each stakeholder. The following section outlines the current status, major challenges, and response strategies for each type of farm.

¹⁵³ The Union of Dairy Enterprises of Ukraine. "Official Website". <https://uadairy.com/en/>, (Accessed 2025-08-21).

¹⁵⁴ The Consulting Center of the Association of Milk Producers of Ukraine. "Official Website". <https://avm-kc.org.ua/en>, (Accessed 2025-08-21).

¹⁵⁵ Ukrainian Holstein Association. "Official Website". <https://holstein.com.ua/en/ukrainian-holstein-association/>, (Accessed 2025-08-21).



Source: JICA survey team based on Interview Survey

Figure4.4.1 Dairy Value Chain

(1) Large-Scale Enterprise Farms (Supplying to Major Dairy Manufacturers)

Large-scale enterprise farms are characterized by having a large number of dairy cattle, enabling them to establish efficient production systems and achieve relatively high profitability. Many of these farms have secured stable sales channels for raw milk through contracts with major dairy manufacturers, which also tends to provide them with favorable pricing.

However, the recent instability in Ukraine—particularly since the Russian military invasion—has led to a serious outflow of human resources from the agricultural sector, with a notable loss of young workers and skilled professionals. Although agricultural universities and technical schools supply a certain number of new graduates, they are insufficient to meet the demand for immediate, job-ready talent, resulting in chronic shortages of specialists such as veterinarians, machine operators, and management personnel.

Significant challenges also exist in terms of equipment. While some large-scale farms have introduced Western-made milking machines and pipeline cooling systems to enhance hygiene management and production efficiency, others continue to use equipment dating back to the Soviet era. Investment in state-of-the-art equipment requires substantial capital and long payback periods, making it difficult for farms to commit to such investments amid current political and economic uncertainty. Aging equipment leads to decreased production efficiency and increased hygiene risks, which can negatively impact both the quality and yield of raw milk.

To address these issues, it is necessary in the short term to promote proper maintenance and partial upgrades of existing equipment, while strengthening collaboration with agricultural education institutions to cultivate practical human resources through expanded internships and on-site training. In the long term, farms should seek to secure funding in partnership with international financial institutions and external investors, and systematically plan for phased equipment modernization. In addition, management reforms should be considered, including improvements to workplace conditions and

compensation in the agricultural sector, as well as the introduction of labor-saving measures through the use of advanced ICT technologies for operational efficiency and automation.

(2) Medium-Scale Enterprise Farms (Fewer Than 400 Cows, Supplying to Major Dairy Manufacturers)

Medium-scale enterprise farms with fewer than 400 cows find it challenging to achieve profitability due to insufficient economies of scale, making stable management through dairy alone a significant issue.

In particular, rising feed¹⁵⁶ and fuel prices are placing considerable pressure on operations. In Ukraine, many feed additives are reliant on imports, and the ongoing conflict and logistical constraints have led to soaring prices for vitamins, minerals, and other feed additives. In addition, global grain price increases have further raised the burden of feed costs.

Fuel shortages are also severe, with unstable supplies of electricity and gas affecting overall production activities. Smaller farms, in particular, struggle to pass these increased costs onto buyers, resulting in declining profit margins and greater management instability.

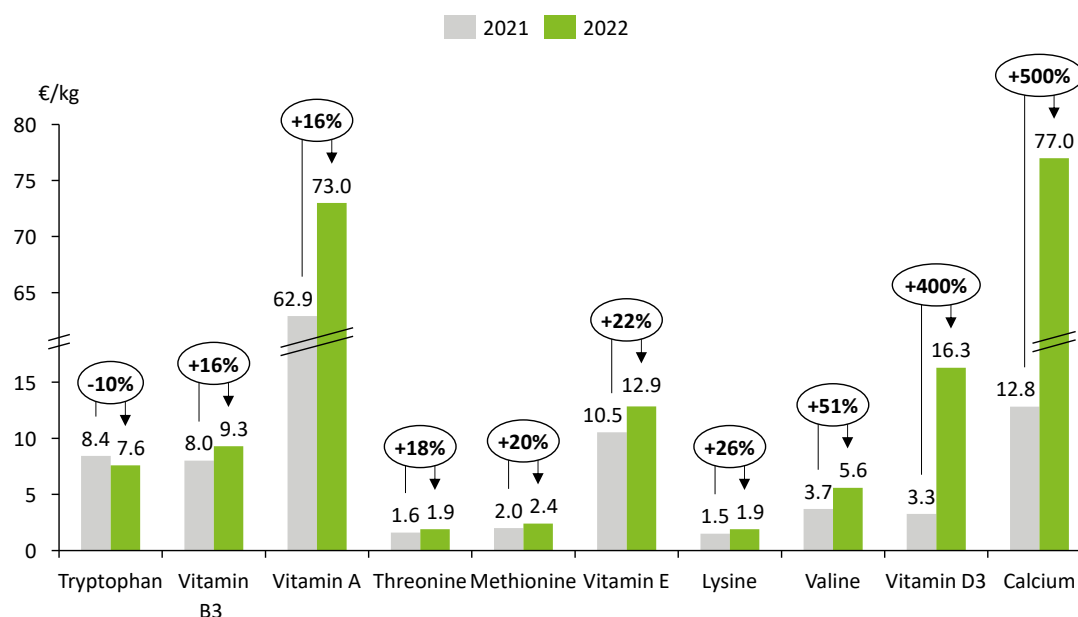
Securing human resources is another serious challenge, as the agriculture sector faces a shortage of workers due to the outflow of young people, military mobilization, and overseas migration. For medium-scale farms, obtaining a sufficient number of skilled professionals and technical workers is essential for scaling up and improving productivity. However, it is currently difficult to secure a diverse workforce—including field workers, managers, and technicians—which hinders stable management and the maintenance of production systems.

To address these challenges in the short term, it is essential to provide technical guidance aimed at maximizing the efficiency of existing feed use, review feed management methods, and disseminate cattle health management technologies. For example, by conducting nutritional analysis of roughage and designing optimal feeding plans, farms can make the most of limited feed resources and improve both milk yield and quality. Additionally, adopting energy-saving production methods, establishing joint purchasing systems within the region, and utilizing information-sharing networks can be effective in reducing costs.

From a long-term perspective, farms should aim to introduce amino acid-balanced feeds and high-value functional feeds, establish self-sufficient feed production systems using local resources, and promote the use of renewable energy such as biogas. The adoption of heat pumps, which contribute significantly to energy efficiency, can also help curb fuel costs. For human resource development, it is necessary to actively implement diverse recruitment strategies in collaboration with local agricultural organizations and government agencies, including promoting the appeal of agriculture, encouraging the

¹⁵⁶ Eastern European Correspondents. “Feed additives prices soar in Ukraine”. 2022-08-08. <https://www.allaboutfeed.net/animal-feed/feed-additives/feed-additives-prices-soar-in-ukraine/>. (Accessed 2025-08-21).

participation of women, elderly people, and foreign workers.



Source: JICA survey team based on ALL ABOUT FEED 「Feed Additives prices soar in Ukraine」 (<https://www.allaboutfeed.net/>)

Figure 4.4.2 Price Trend of Major Feed Additives (€/kg)

(3) Small and Medium-Scale Enterprise Farms (Supplying to Small and Medium-Scale Dairy Manufacturers)

Many small and medium-scale enterprise farms continue to rely on outdated production technologies and equipment from the Soviet era, resulting in insufficient hygiene management and inadequate cooling facilities, which contribute to a decline in raw milk quality. The small size of barns, the use of tie-stall housing, and deteriorating pipelines lead to inefficiencies and pose sanitation concerns. Aside from the minimum quality inspections mandated by the government, quality control is largely left to the discretion of individual farms, resulting in inconsistent inspection frequency and accuracy.

Furthermore, as small and medium-scale dairy manufacturers have limited quality requirements, there is little incentive for producers to improve quality. This is because their main sales channels are regional retail markets, where high-quality dairy products are not necessarily demanded. In some cases, small and medium-scale dairy manufacturers purchase raw milk unofficially, process it, and sell it locally. Such transactions are not reflected in official statistics and are effectively treated as part of the black market.

Additionally, the aging processing equipment at these dairy manufacturers makes it difficult to produce high-quality dairy products, resulting in low quality requirements for farmers. Rising feed costs further strain management, making it difficult to provide balanced rations. Structurally, labor shortages due to youth disengagement from agriculture and workforce outflow are prevalent, and small farms in particular are finding it increasingly difficult to maintain production systems.

To address these challenges in the short term, it is essential to promote the dissemination of hygiene management techniques and support the introduction of simple cooling equipment, thus raising quality awareness at the farm level. Introducing quality incentive schemes in collaboration with dairy manufacturers, and promoting price differentiation based on quality, can also motivate producers to pursue quality improvements. Joint purchasing frameworks should be expanded, and technologies for local feed production should be promoted to help reduce feed costs.

In the long term, supporting the establishment of clusters among farms can facilitate shared use of equipment and materials, standardization of quality control systems, and improved management efficiency through information sharing. For example, Family Dairy Farms is an organization that supports the modernization, productivity improvement, and quality enhancement of small-scale dairy farms in Ukraine through cluster activities. Each farm can receive comprehensive services from project experts, enabling even small-scale farms to achieve profitable agricultural businesses. Furthermore, efforts should be made to establish a sustainable production system by promoting human resource development in collaboration with local agricultural organizations, government, and educational institutions, and by encouraging the participation of women and the elderly in agriculture.

Should Ukraine join the EU, new opportunities may arise for small and medium-scale enterprise farms, which have traditionally produced lower-quality raw milk. EU accession would provide access to subsidies, technical assistance, and educational programs in the agricultural sector, making it easier to obtain the funding and know-how necessary for equipment investment and production technology improvement. On the other hand, compliance with the EU's strict agricultural standards and quality certification systems will be required, leaving challenges such as upgrading outdated milking and cooling equipment, strengthening hygiene management systems, and improving feed quality. Since many small and medium-scale farms lack sufficient investment capacity and specialized knowledge, EU accession alone may not directly resolve these issues. Therefore, ongoing external technical cooperation and financial support will remain essential.

(4) Household Farms (Supplying to Small and Medium-Scale Dairy Manufacturers)

Household farms primarily sell surplus milk after meeting their own consumption needs. As a result, they have limited motivation to improve raw milk quality or profitability, and their small scale prevents them from enjoying the benefits of economies of scale. Reliance on outdated production methods and equipment from the Soviet era, lack of refrigeration facilities, and insufficient knowledge of hygiene management are major factors contributing to declining quality. In particular, available refrigeration equipment is typically designed for 10-20 cows, making it uneconomical for household farms that keep only two or three cows, resulting in limited adoption. Apart from government-mandated milk inspections, quality control is largely left to the discretion of the farmers, and inspection frequency is often inadequate. Rising feed and fuel costs, as well as supply risks due to logistical constraints, further strain farm management. Labor shortages are also a serious issue, exacerbated by youth disengagement from agriculture, military mobilization, and overseas migration.

To address these challenges in the short term, it is effective to support the introduction of refrigeration and hygiene management equipment, provide thorough technical guidance on hygiene practices, and implement on-site training and quality awareness campaigns in collaboration with dairy manufacturers and local agricultural organizations.

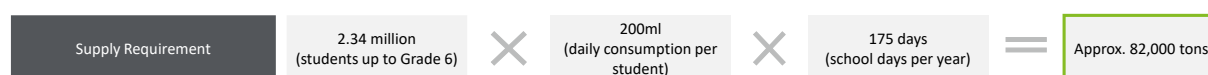
In the long term, it is important to encourage participation in dairy cooperatives or the formation of new cooperatives to promote shared use of equipment, joint purchasing, and the standardization of quality management systems. Additionally, strategies should include promoting local feed production using regional resources, supporting the involvement of women and the elderly in agriculture, and revitalizing local communities to secure human resources.

(5) School nutrition reform

Regarding milk in the school nutrition reform, this section outlines the challenges to ensuring its stable supply and proposes corresponding short- to long-term countermeasures. This analysis is based on an assessment of the required quality standards, necessary supply volumes, and the current situation of suppliers.

The milk supplied under the reform is required to comply with DSTU 7566-2014, the quality standard for milk for children¹⁵⁷. Meeting this standard necessitates the use of high-quality raw milk equivalent to the "Extra" grade, the highest tier under the national raw milk quality standard, DSTU 3662-2018¹⁵⁷.

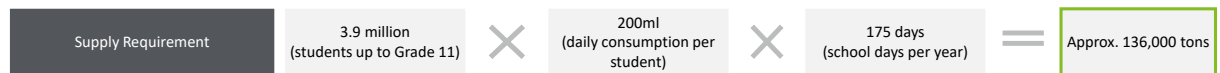
The required supply volume will increase in stages according to the reform's progress. In the short term, as the program expands to all students up to the 6th grade by September 2026, approximately 82,000 tons will be required. This corresponds to about 8.4% of the 2021 production volume of "Extra" grade raw milk. In the medium to long term, as the program extends to all students up to the 11th grade over the next several years, the requirement will grow to approximately 136,000 tons, corresponding to about 14% of the "Extra" grade production. However, dairy processors procure only 49% of their "Extra" grade raw milk from "Enterprise" farms, and this milk is also used as an input for other dairy products for the general public, including processed goods and exports. Given these supply-side constraints, ensuring a stable supply for school meals under the current production system is difficult, and it is anticipated that the required volume may not be met.



Source: JICA survey team

Figure4.4.3 Short-Term Projected Supply Requirement: Expansion to Grade 6 (by Sep 2026)

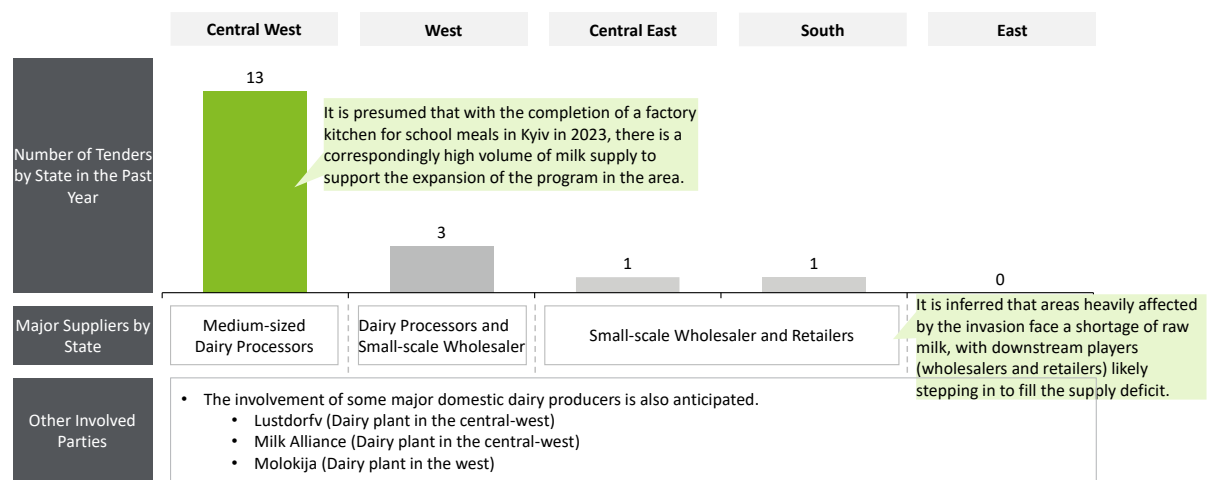
¹⁵⁷ Коржова Катерина Олександрівна. "Improvement of the safety management system for the production of vitamin-enriched ultra-pasteurized milk (fat content 2.5%) at the branch of LLC 'Yahotynsky Maslozavod' ('Yahotynske for Children)". <https://dspace.nuft.edu.ua/server/api/core/bitstreams/9cbc9304-3403-4ce0-8890-4cc5f7310e8a/content>, (Accessed 2025-08-21).



Source: JICA survey team

Figure4.4.4 Mid- to Long-Term Projected Supply Requirement: Expansion to Grade 11 (in the coming years)

The primary suppliers are medium-sized dairy processors, with a high concentration of supply in the central-western regions (based on transaction records over the past year on "Prozorro Market," the e-platform for public procurement). The involvement of major dairy processors is presumed to be limited, with some participating in related events for educational institutions in collaboration with the Ministry of Education and Science of Ukraine and with support from Switzerland¹⁵⁸.



Source: JICA Survey Team based on transaction data for public procurement, including school milk, from the Prozorro Market e-platform over the past year (as of June 17, 2025). (<https://prozorro.gov.ua/ProzorroMarket>)

Figure4.4.5 Suppliers of School Milk

Considering quality standards, required supply volume, and suppliers, it is necessary to examine challenges and response strategies for both the short term (from September 2026 onward) and the medium to long term (over the coming years). A common issue for both periods is that, as the number of schools receiving school meal milk increases, there is a possibility that the existing small and medium-sized dairy manufacturers in the region may not be able to supply sufficient quantities of Extra grade raw milk, assuming a policy of local production for local consumption. Since local sourcing of school meal milk is a key goal of school nutrition reform, the role of regionally rooted small and medium-sized dairy manufacturers will become increasingly important going forward.

As a short-term measure, the most effective approach is to source school meal milk from large-scale dairy manufacturers. If school meal milk is to be procured from small and medium-sized dairy manufacturers, it will be necessary to improve the quality of raw milk at existing supplier farms and to

¹⁵⁸ Quality FOOD Trade Program. "Results of the competition for educational institutions on the occasion of World School Milk Day". 2023-11-01. <https://qftp.org/news/rezultaty-konkursu-dlia-zakladiv-osvity-z-nahody-vseshitnoho-dnia-shkilnoho-moloka/>, (Accessed 2025-08-21).

establish new procurement systems from farms capable of producing high-quality raw milk. However, developing such quality management systems and securing new suppliers is difficult to achieve in a short period of time. Therefore, under current conditions, procuring milk from large-scale dairy manufacturers that already meet the supply standards for school meals is considered the most realistic and promising option.

In the medium to long term, it will be necessary to fundamentally strengthen the supply base in collaboration with small and medium-sized dairy manufacturers, dairy cooperatives, and major distributors. To procure greater volumes of high-quality raw milk, it is essential to improve the quality of raw milk produced by farms currently supplying lower-quality (First grade) milk, primarily small and medium-sized enterprise dairy farms. Therefore, initiatives by small and medium-sized dairy manufacturers to encourage quality improvements among their supplier farms, as well as promoting participation in dairy cooperatives, are expected to be effective strategies.

4.4.2 Challenges and Strategies in Processing

The current situation and challenges of dairy processing in Ukraine's dairy sector vary significantly depending on the size of the dairy manufacturers, the quality of raw milk procured, and the target markets. Specifically, dairy manufacturers can be categorized as either large-scale or small and medium-scale, with each facing distinct challenges and requiring different response strategies. The following section provides an analysis of the current status, major issues, and response strategies for each type.

(1) Large-Scale Dairy Manufacturers

The greatest challenge for large-scale dairy manufacturers is low profitability. While farm profitability remains relatively high at around 40%, the manufacturers' profit margins are only a few percent. This is mainly due to soaring fuel costs and rising raw milk prices caused by the ongoing conflict. Additionally, manufacturers maintain long-term relationships with farms and continue to purchase raw milk at relatively high prices, even as domestic demand declines. Although the supply of high-quality raw milk within Ukraine is sufficient, structural issues such as population decline and reduced consumption directly lead to decreased sales. To expand sales in the future, it will be essential to develop export markets, especially targeting EU countries.

However, entering export markets faces a major barrier: the lack of price competitiveness for Ukrainian dairy products. Dairy products from EU countries benefit from government subsidies, allowing them to maintain lower production costs and a clear price advantage. In contrast, Ukrainian dairy manufacturers do not receive such subsidies and are unable to invest in the latest processing equipment, which requires substantial investment and long payback periods. Previously, Ukraine's value-added tax (VAT) refund system functioned as an effective investment incentive, but this system has since been abolished as part of EU integration requirements. As a result, manufacturers must pay VAT when purchasing equipment, further discouraging investment. Consequently, aging facilities make it difficult to maintain or improve production efficiency and product quality, limiting the ability to

produce high-quality, price-competitive dairy products for export markets.

Human resource challenges are also severe. The ongoing conflict has led to the outflow of not only technical experts and quality control staff, but also general labor, resulting in a shortage of personnel required for stable factory operations and high-quality dairy production. This makes it difficult to optimize quality management and production processes, imposing significant constraints on the production of competitive dairy products.

In response to these challenges, short-term strategies should focus on reviewing fuel and raw milk procurement costs and building efficient production systems. In the medium to long term, introducing or utilizing subsidy programs from international organizations and the government, as well as combining various funding sources including external capital, will be important for making phased investments in state-of-the-art processing equipment to enhance competitiveness. Additionally, to enter the EU market, it is essential to develop products and strengthen marketing systems that meet local market needs and quality standards. On the human resource side, collaboration with educational institutions and local communities to enhance training programs, improve working conditions, and stabilize employment will be necessary.

If Ukraine joins the EU in the future, many new opportunities are expected for dairy manufacturers. Access to the EU internal market will expand, greatly increasing sales opportunities in a large, unified market. This will allow Ukrainian manufacturers, previously facing a shrinking domestic market and population decline, to secure stable sales channels and expand their scale. Ukrainian dairy products, especially traditional yogurts, cheeses, and fermented products, can be differentiated and add value in the EU market through unique manufacturing methods and flavors.

Furthermore, EU membership will require compliance with EU food safety and quality standards, incentivizing manufacturers to upgrade production and processing systems and strengthen quality management. This will enable the development of high-quality dairy products that meet international standards and enhance brand value.

On the other hand, EU accession is expected to intensify market competition, introducing new challenges such as competition with major EU dairy manufacturers and increased costs for compliance with EU standards. Overcoming these challenges will drive modernization and strengthen the international competitiveness of the Ukrainian dairy industry. To achieve this, the introduction of advanced processing equipment, securing highly skilled personnel, and development of new markets will be indispensable. Moving forward, product development for the EU market, establishment of robust quality management systems, and building capacity to utilize EU subsidies and programs will pave the way for sustainable growth for Ukrainian dairy manufacturers.

(2) Small and Medium-Scale Dairy Manufacturers

Small and medium-scale dairy manufacturers face three major challenges: low profitability, difficulty in securing high-quality raw milk, and labor shortages. These manufacturers have limited sales, and rising fuel and material costs further squeeze profit margins. Additionally, declining domestic

consumption due to population decrease directly leads to reduced sales, destabilizing their business foundations. To improve profitability, it is essential to shift from low-quality to high-quality dairy products and develop new sales markets.

Securing high-quality raw milk is a significant challenge for producing high-quality dairy products. Historically, these manufacturers have sourced raw milk from collection centers, but the quality has been suboptimal, and direct contracts with farms are limited. As a result, efforts to improve quality have been insufficient. Aging processing machinery further complicates the issue, as investment requires long payback periods and political instability makes such decisions difficult, resulting in slow equipment upgrades. Ukraine's tax system also poses a burden, as VAT payments delay equipment renewal, leading to reduced productivity and difficulty in producing high-quality dairy products. Moreover, having previously sold low-quality products, manufacturers must seek new sales channels for high-quality products. With the promotion of local milk sourcing for school nutrition reforms, developing new distribution strategies such as supplying regional school meals is also important.

Labor shortages, similar to those faced by large-scale manufacturers, are a major issue, with outflows of both specialized and general labor making stable factory operation and quality management difficult. This adversely affects product quality, production efficiency, and overall business stability.

In response to these challenges, short-term strategies include thorough cost reduction and efficiency improvements, maintenance and partial upgrades of existing equipment to maintain productivity, and strengthening collaboration with contract farms and introducing quality incentive schemes to improve the quality of raw materials. Additionally, exploring new local sales channels such as school meals and developing locally focused products and marketing strategies will be effective. In the long term, introducing external capital and partnering with international organizations for investment in advanced equipment, upgrading quality management systems, and enhancing human resource development programs should be pursued to build a stable supply of skilled labor.

4.4.3 Target Groups for Support

In assessing the priorities for support among stakeholders in Ukraine's dairy sector, the evaluation is based on the challenges faced by each player, the urgency of support, the scope of impact on Ukrainian dairy farming, and the significance of the support.

For large-scale enterprise farms, while some face challenges such as delayed modernization of facilities, most have contracts with dairy manufacturers and play an important role in ensuring the stability and sustainability of raw milk supply. Thus, the significance of supporting them is high. However, these large-scale farms generally maintain high profitability and possess the financial resources to invest in equipment independently. Therefore, the urgency of support is low, and the impact is limited to those few farms lagging in modernization.

Medium-scale enterprise farms (less than 400 cows) primarily face low profitability, making scale expansion and productivity improvement necessary. However, their lack of financial resources makes

self-driven improvement difficult, resulting in a high urgency for support. Additionally, a significant number of medium-scale farms have contracts with dairy manufacturers, contributing to the overall stability and sustainability of raw milk supply, which increases the impact and significance of support. Supporting these farms is directly linked to strengthening the foundation of Ukraine's dairy industry.

Small and medium-scale enterprise farms face challenges related to both low raw milk quality and profitability. With upcoming revisions to raw milk quality standards and the promotion of local consumption of high-quality milk through school nutrition reform, there is a strong need for these farms to produce higher-quality milk. The urgency is extremely high, as these farms account for approximately 30% of the total raw milk produced by enterprise farms, making the scope of impact broad. Furthermore, integration with the EU and the raising of domestic standards make technical guidance, investment in equipment, and support for hygiene management essential. School nutrition reform also directly impacts regional employment and sustainability, further elevating the social significance and priority of support for these farms.

For household farms, low raw milk quality and profitability are ongoing issues, and revisions to raw milk quality standards are planned in the near future. Continued low profitability threatens business sustainability, resulting in high urgency for support. However, although household farms produce a large volume of raw milk, most is consumed within the household, and the amount supplied to the market is limited. In recent years, both production and market supply from household farms have been declining, while output from enterprise farms is increasing. Therefore, the scope and significance of support for household farms are relatively low.

Large dairy manufacturers face challenges such as low international competitiveness and profitability. As they process the majority of dairy products in Ukraine, their impact on the industry is significant, and the significance of supporting them is high from the perspective of industry maintenance and growth. Increasing profitability requires expanding exports due to declining domestic demand, but current competitiveness is low. While rapid improvement is desirable, large manufacturers are capable of addressing these issues independently, so the urgency of support is low.

Small and medium-sized dairy manufacturers face difficulties in procuring high-quality raw milk and low profitability. Although their production volume is not as high as large manufacturers, they play a certain role in supplying milk to local school meal programs as part of school nutrition reform. However, their overall impact on the industry is limited. The production of high-quality dairy products requires access to high-quality raw milk, which depends on the quality improvements of small and medium-sized farms. At this stage, the urgency of support is low.

Labor shortages are an industry-wide issue affecting both farms and manufacturers, with high urgency and broad impact. The exodus of young people from agriculture, military mobilization, and emigration have exacerbated labor shortages across all skill levels, from general workers to skilled personnel. From the perspective of sustainability and nurturing the next generation of agricultural workers, the significance of support is extremely high.

In summary, the highest priority for support should be given to medium-scale enterprise farms (less than 400 cows) and small and medium-scale enterprise farms. Additionally, addressing labor shortages is a critical issue for the sustainability of the entire industry and should also be prioritized. Concentrated support in these areas is a strategic initiative directly linked to the stability and development of Ukraine's dairy sector.

4.5 Proposals

4.5.1 Support for Medium-Scale Enterprise Farms with Fewer Than 400 Cows (Technical Cooperation Project and Grant Aid)

First, it is recommended to support medium-scale enterprise farms with fewer than 400 cows by utilizing JICA's technical cooperation and grant aid schemes. This initiative should be implemented mainly through Department of Agrarian Development and the Department of Rural Development, Ministry of Economy, Environment and Agriculture of Ukraine and dairy farmers' associations, with the primary aim of enhancing the productivity and profitability of medium-scale enterprise farms belonging to these associations.

The raw milk processing industry in Ukraine is mainly divided into large dairy manufacturers and medium-sized dairy manufacturers. The former procures high-quality raw milk from both large and medium-scale enterprise farms with fewer than 400 cows. While large enterprise farms boast a high profit margin of over 40%, medium-scale enterprise farms with fewer than 400 cows often have low profitability, with many failing to reach the break-even point. This is because dairy farming is an industry with strong economies of scale, and around 400 cows is generally considered the break-even threshold. Furthermore, recent increases in energy and feed costs have further squeezed profitability. Many of these farms attempt to secure profits through diversified management and the sale of by-products, but fundamental business improvement has not been achieved. Expanding herd size is key to improving profitability, but a lack of capital makes such expansion difficult. Therefore, the practical approach is to first enhance productivity through efficiency improvements and energy saving, and then proceed with facility expansion when profitability has improved.

This issue has also been pointed out by the Association of Milk Producers of Ukraine (AMP), and currently, there is insufficient support from the government. There are approximately 500 medium-scale farms in Ukraine with 100 to 400 cows (including those not contracted with major dairy manufacturers), and they play a critical role in the stability and sustainability of domestic raw milk supply, making the significance of supporting them extremely high. This initiative targets medium-scale enterprise farms affiliated with producer associations such as AMP, working through Department of Agrarian Development and the Department of Rural Development, Ministry of Economy, Environment and Agriculture of Ukraine. Specifically, collaboration will be established with organizations within AMP that possess specialized human resource development and technical support functions, such as the Consulting Center, Dairy Center Kischenzi (DCK), and Uman Labs. AMP has more than 150 member farms, with an average herd size of 600 cows per farm, but the focus will be on providing intensive

support to farms with fewer than 400 cows.

Through JICA's technical cooperation, the management know-how and expertise in environmental and energy measures developed by advanced large-scale farms in Japan with 300–400 cows will be transferred to local Ukrainian farms via experts and trainers from AMP and related organizations. Specifically, training and guidance will be provided on themes such as production management efficiency, profitability improvement measures, and energy/environmental strategies, supporting local farmers to achieve productivity improvements independently. In addition, through grant aid, the latest technologies – including energy-saving equipment, automation devices, barn environment control technologies, and by-product processing technologies—will be leased or lent via the association, thereby reducing the initial investment burden and promoting sustainable business improvement. This approach aims to achieve both efficiency and energy savings simultaneously, thereby strengthening the competitiveness of medium-scale enterprise farms.

Project Objective

To transfer the expertise of highly profitable and productive large-scale farms in Japan, while also promoting the introduction of energy-saving and efficiency-enhancing technologies through grant aid. This will contribute to improving the productivity and profitability of medium-scale enterprise farms with fewer than 400 cows.

Beneficiaries

If the Association of Milk Producers of Ukraine (AMP) serves as the implementing association, the target beneficiaries are AMP member farms with fewer than 400 cows. AMP has 150 member farms, with an average herd size of 600 cows per farm. Assuming a uniform distribution due to lack of individual data, it is estimated that about 50 of these are medium-scale enterprise farms with fewer than 400 cows.

Implementing Agencies

Department of Agrarian Development and the Department of Rural Development, Ministry of Economy, Environment and Agriculture of Ukraine and producer associations

Applicability of Japanese Technology

The expertise of large-scale Japanese dairy farms, which achieve high profitability and productivity, can be transferred through experts affiliated with academic institutions and dairy-related organizations. Many of these institutions have partnership agreements with JICA, making it highly likely that their cooperation can be secured for project implementation. Specifically, the utilization of knowledge held by the following educational and dairy-related organizations is expected.

Table4.5.1 Japanese Dairy-Related Academic Institutions and Organizations

Knowledge Type	Attribute	Organization Name	Summary
General	Academic Institution	Obihiro University of Agriculture and Veterinary Medicine	It is known as the only livestock college among the national universities in Japan, and has a livestock department. Japan's first university to conclude a comprehensive cooperation agreement with JICA that focuses on the veterinary and livestock sectors
General	Academic Institution	Rakuno Gakuen University	We have established a cooperative relationship with JICA over many years. Partnership Agreement signed in October 2024
General	Academic Institution	Tokyo University of Agriculture	Academic agreement concluded with the National University of Life and Environmental Sciences of Ukraine in 2003
General	Academic Institution	Hokkaido University	Concluded Comprehensive Partnership Agreement with JICA in April 2025
General	Government Agency	National Agriculture and Food Research Organization	An organization under the jurisdiction of the the Ministry of Agriculture, Forestry and Fisheries that promotes multifaceted technological development in order to solve the problems facing Japan's livestock industry and strengthen its international competitiveness
Hygienic Management	General Incorporated Association	Japan Dairy Council	Organization to stabilize milk supply and demand, rationalize distribution, improve quality, and promote understanding of dairy and domestic milk products
Hygiene Management, Raw Milk Quality	General Incorporated Association	Japan Dairy Industry Association	An industry group that contributes to the sound development of the entire dairy industry and the improvement of public health by aiming to improve the quality of milk and dairy products, hygiene management, demand expansion, fair trade, and environmental measures.
Raw Milk Quality, Raw Milk Inspection	Public Interest Incorporated Foundation	Japan Dairy Technical Association	An organization that aims to improve the quality of milk and dairy products, promote food hygiene, dairy and dairy industries, and contribute to a healthy diet
Hygienic Management	Public Interest Incorporated Association	Japan Livestock Industry Association	An organization that plays a central role in the promotion of livestock in Japan through a wide range of businesses, with the aim of improving livestock management, ensuring a stable supply of safe livestock products, and improving livestock hygiene.

It is envisaged that technologies already implemented in advanced large-scale dairy farms in Japan with herd sizes of 300-400 cows, and with proven track records overseas, will be applied. These Japanese technologies can make significant contributions to improving productivity, operational efficiency, and energy conservation in dairy production. Specifically, the following technologies are considered applicable for this project.

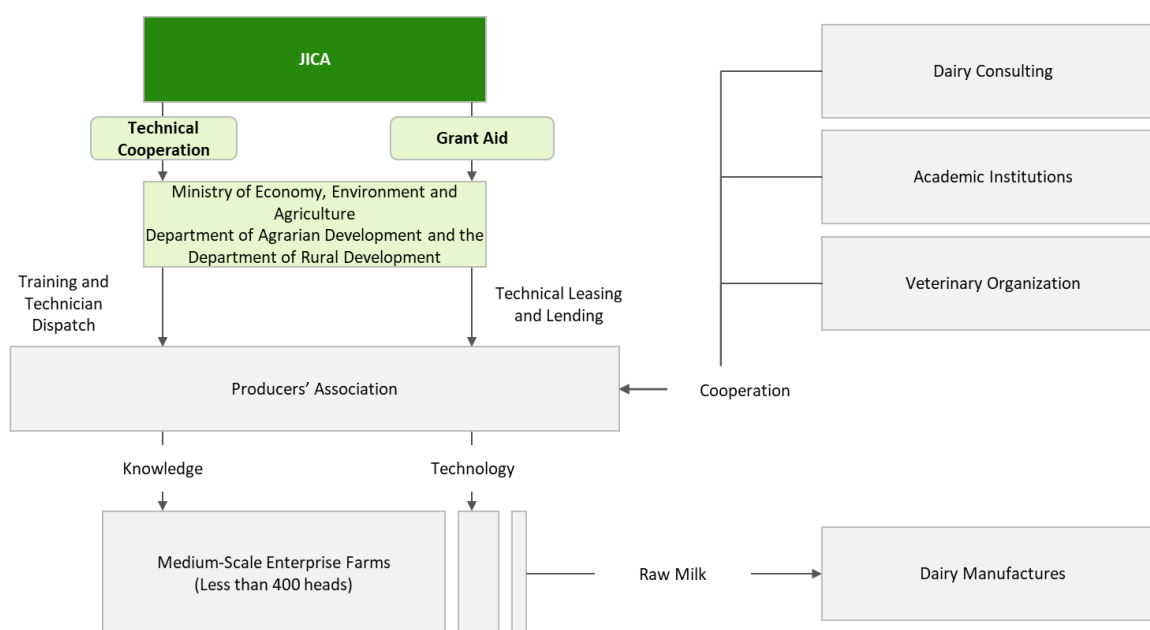
Table4.5.2 Japanese Technologies (For Medium-Scale Enterprise Farms with Fewer Than 400 Cows)

Types of technology	Technology	Overview
Productivity Enhancement	Estrus, rumination, and activity sensor	Regular measurement of activity, rumination, and rest with collars and ear tags. Reducing missed estrus and early detection of changes in physical condition improve breeding performance and reduce milk yield losses.
	Feed analysis and formulation optimization software	NIR, etc., are used to measure feed ingredients and moisture, and the formulation is automatically corrected with software. It reduces overfeeding and underfeeding as well as daily fluctuations and improves milk components and feed efficiency.
	Labor monitoring sensor	Detect and notify signs of calving with tail attachment and body temperature and behavior data. Reduce calf mortality and mother attrition by saving labor at night and early intervention in difficult births
	Herd management software	Centralized management of breeding, milk yield, treatment, culling, and herd testing. Alerts and reports support decision-making, reducing missed tasks and the burden of record-keeping.
Automation and Efficiency	Milking robot	Cows voluntarily go to the milking booth and automate attachment, milking, and cleaning. Significantly reduce labor and improve productivity by increasing the number of milking sessions.
	Feeding robot	TMR is automatically transported and supplied for feeding to optimize the frequency and timing of feeding. In addition to labor savings, balancing intake contributes to rumen stability and the stability of milk yield and milk components.
	Automatic scraper	Automatically removes manure from the aisles regularly to maintain cleanliness. Saves labor in fecal removal work, reduces the risk of hoof disease and mastitis, and is effective in suppressing odors.
Energy conservation	Biogas power generation	Anaerobic fermentation of manure to recover methane for use in power generation and boiler heat. It can supplement electricity and fuel, reduce odors, and allow the digestate to be used as fertilizer.
	Solar and storage batteries	Generate electricity from solar power and use it for self-consumption in milking and cooling. Storage batteries help level electricity costs by reducing peak power and the risk of power outages.

Other Considerations

- To ensure the sustainability of the project, it is essential to establish fair and highly transparent business relationships between producer associations and their member farms.
- It is necessary to continuously monitor security conditions and supply chain disruption risks

resulting from the ongoing invasion, and to maintain flexibility in revising project plans as needed.



Source: JICA survey team

Figure 4.5.1 Support for Medium-Scale Enterprise Farms with Fewer Than 400 Cows

4.5.2 Support for Small and Medium-Scale Enterprise Farms (Technical Cooperation Project and Grant Aid)

Second, it is proposed to implement support for small and medium-scale enterprise farms utilizing JICA's technical cooperation and grant aid schemes. This initiative will be led by Department of Agrarian Development and the Department of Rural Development, Ministry of Economy, Environment and Agriculture of Ukraine and cluster providers, focusing primarily on improving the raw milk quality of affiliated small and medium-scale enterprise farms.

The target small and medium-scale enterprise farms supply raw milk to small and medium-sized dairy manufacturers, but currently, low milk quality is a structural issue. The main causes include the continued use of outdated facilities and equipment dating from the Soviet era, insufficient cooling and hygiene management facilities, lack of knowledge in storage and quality management, and, due to logistical constraints, deterioration in feed balance (especially with rising costs of feed additives such as vitamins and minerals). Milk quality testing is also largely left to the discretion of farmers, apart from the minimum inspections mandated by the government, resulting in inadequate management systems.

Additionally, at present, small and medium-sized dairy manufacturers do not necessarily demand high-quality raw milk, and there is little incentive for farmers to improve quality. This is because the main sales channels for small and medium-sized dairy manufacturers are local retail markets, which do not always require high-quality dairy products. Furthermore, some small and medium-sized dairy manufacturers purchase raw milk unofficially, process it, and sell it locally. Such transactions are not included in official statistics and are, in effect, considered part of the black market. The existence of this black market makes it difficult to enforce strict milk quality management and ensure traceability, thereby

hindering overall industry quality improvement.

However, with EU integration, the raising of domestic standards, and increasing demand for high-quality local milk due to school nutrition reforms, fundamental improvement in raw milk quality will be essential in the future. If these institutional and market changes are not addressed, small and medium-sized dairy manufacturers and their supplying farms risk being forced out of the market. On the other hand, support for small and medium-scale farms is highly significant not only for strengthening producer competitiveness but also for maintaining local employment and the sustainability of communities.

This initiative will be implemented in collaboration with cluster providers such as the Agro-Food Consulting Agency and Family Dairy Farms, via Department of Agrarian Development and the Department of Rural Development, Ministry of Economy, Environment and Agriculture of Ukraine. The Agro-Food Consulting Agency is an NGO established by The Union of Dairy Enterprises of Ukraine, with a mission to improve milk quality, strengthen value chains, and close the technology gap for multiple small and medium-sized farms, including those in Boryspil city. Key stakeholders include dairy consultants from the Union, the National University of Life and Environmental Sciences, the Swisscontact Foundation, and the Veterinary Alliance of Ukraine. Family Dairy Farms is an organization led by Ukrmilinvest, working with local governments in Khmelnytskyi, Ternopil, and Rivne regions, and cooperating with organizations such as LADS and the Ukrainian Cooperative Federation to foster and support small-scale dairy farmers.

Through JICA's technical cooperation, Japanese knowledge on feed and nutrition design, quality and hygiene management, as well as breeding and health management, will be transferred to experts and trainers working with cluster providers, who will then provide guidance and dissemination to local farmers. Under the grant aid scheme, equipment and technologies such as nutritionally balanced feed, milk testing and analysis devices, energy-saving equipment, and water treatment facilities will be leased or lent via clusters to reduce the initial investment burden on farmers. This will help raise the quality and productivity of raw milk at small and medium-scale enterprise farms, contributing to the improvement of the overall value chain's quality and competitiveness.

Project Objective

To transfer Japanese expertise in feed and nutrition design, quality and hygiene management, and breeding and health management, while promoting the introduction of technologies that contribute to improved raw milk quality and productivity through grant aid. This will help realize improvements in raw milk quality among small and medium-scale enterprise farms.

Beneficiaries

The target beneficiaries are 12 small and medium-scale enterprise farms located in Boryspil city, Kyiv region.

Implementing Agencies

Department of Agrarian Development and the Department of Rural Development, Ministry of

Economy, Environment and Agriculture of Ukraine and cluster providers

Applicability of Japanese Technology

Japanese expertise in feed and nutrition design, quality and hygiene management, and breeding and health management is expected to be transferable through experts affiliated with academic institutions and dairy-related organizations. These institutions have signed partnership agreements with JICA, making it highly likely that their cooperation can be secured for project implementation. Moreover, this expertise is applicable not only to medium-scale farms with fewer than 400 cows but also to small-scale farmers. The accumulated know-how of Japanese dairy-related organizations contributes to the efficiency and quality improvement of dairy production regardless of farm size, and especially includes many practical techniques and management methods suitable for small-scale farms. Specifically, the utilization of knowledge held by the institutions and organizations listed in Table 4.5.1 “Japanese Dairy-Related Academic Institutions and Organizations” is expected.

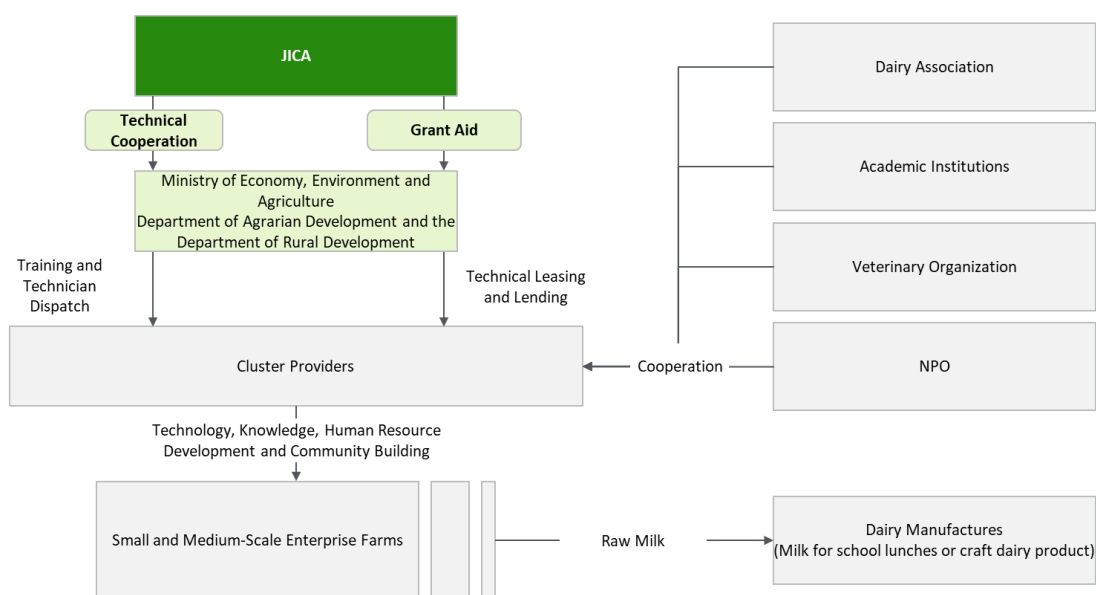
The project targets various technologies that have contributed to improvements in raw milk quality in Japan, such as cooling and refrigeration equipment, barn environment control technologies, milk analysis devices, and nutrition management technologies, as well as technologies that enhance productivity, efficiency, and energy conservation in dairy production. In particular, the following technologies are considered feasible for introduction under this project.

Table 4.5.3 Japanese Technologies (For Small and Medium-Scale Enterprise Farms)

Types of technology	Technology	Overview
Hygiene Management	Barn Environment Control	Ventilation, temperature and humidity, and wind speed are controlled to keep the floor and sleeping area dry. By suppressing heat and humidity, bacterial growth is reduced, and the number of bacteria associated with mastitis and dirt is decreased.
	Composting	Proper fermentation of manure and bedding (temperature, moisture, and turning) to suppress pathogenic bacteria and odors. Fly incidence is reduced as well, and hygiene standards are improved by preventing recontamination of the barn.
Nutritional management	Balanced feed	Optimizes energy, protein, NDF, minerals, etc., and stabilizes the rumen. Suppresses immune decline and metabolic diseases, contributing to reducing the risk of mastitis and stabilizing milk ingredients.
	Improving drinking water	Promote water intake by cleaning the aquarium, testing water quality (bacteria, iron, sulfates, etc.), and securing water supply. It supports feeding and milk yield, reduces the risk of diarrhea and infection, and stabilizes raw milk quality.
Raw Milk Management	Cooling and storage equipment	Quickly cooled in a pre-cooler or bulk tank to maintain a constant temperature. It suppresses bacterial growth and flavor deterioration, and is highly effective in reducing general bacterial counts and stabilizing shipping quality.
	Raw milk analyzer	Measures fat, protein, lactose, urea nitrogen, and somatic cell-related indicators. Useful for early detection of abnormal milk, feed adjustment, and evidence for mastitis countermeasures.
Health Management	Monitoring sensors	Continuously monitor activity, rumination, and body temperature, and alert you to any abnormalities. Detect signs of mastitis, metabolic disease, and heat stress early to reduce the severity of illness and milk loss.
	Mastitis analysis	On-site evaluation of changes in somatic cell count and milk composition, and, in some cases, estimation of bacterial species. Speed up treatment and isolation decisions that match the cause and are effective for the proper use of antibacterial agents and prevention of chronicity.

Other Considerations

- To ensure the sustainability of the project, it is essential to establish fair and highly transparent business relationships between cluster providers and member farms within the cluster.
- It is necessary to continuously monitor security conditions and supply chain disruption risks resulting from the ongoing invasion, and to maintain flexibility in revising project plans as needed.



Source: JICA survey team

Figure4.5.2 Support for Small and Medium-Scale Enterprise Farms (Technical Cooperation Project and Grant Aid)

4.5.3 Support for Human Resource Development in the Dairy Industry (Technical Cooperation Project)

Third, it is proposed to implement support for human resource development across the entire dairy industry through technical cooperation. This initiative will be led by national academic institutions and vocational training schools, aiming to foster human resources for both dairy farmers and dairy manufacturers and to ensure the appropriate deployment of skilled personnel in the field.

In Ukraine's dairy sector, the outflow of labor due to youth disengagement from agriculture, military mobilization, and overseas migration has become increasingly severe. This has resulted in a shortage of both skilled workers essential for maintaining productivity and quality, as well as general laborers. Labor shortages are evident across the entire value chain, including cattle breeding, milking, logistics, quality management, and sales/marketing, raising concerns about declining industry competitiveness and sustainability.

Some large-scale enterprise farms have begun accepting personnel from local agricultural education institutions and are working on digitalization and automation to reduce labor requirements. However, due to investment costs and technical constraints, it is difficult to introduce these measures across all farms. Efforts to utilize the labor force of women and the elderly are also underway, but these are insufficient to offset the overall labor shortage. Therefore, systematic human resource development is extremely important for the sustainability of the industry and for securing the next generation of agricultural workers, making the significance of support very high.

This initiative will systematically support human resource development for both farmers and dairy manufacturers through collaboration with national academic institutions and vocational training schools, and via producer associations such as the Association of Milk Producers of Ukraine and the Union of Dairy Enterprises of Ukraine. The Association of Milk Producers of Ukraine works with agricultural universities to offer practical training programs for farmers and specialized skill courses such as farm management, artificial insemination, and hoof trimming. The Union of Dairy Enterprises of Ukraine collaborates with the National University of Food Technologies (NUFT), Odessa National Academy of Food Technologies (ONAFIT), and Sumy National Agrarian University (SNAU) to provide training programs for dairy manufacturers on milk quality management, food safety, and quality assurance.

Through JICA's technical cooperation, advanced Japanese knowledge on dairy and manufacturing technologies, farm management, feed management, breeding and hygiene management, and quality control/inspection will be transferred to trainers at these academic institutions and training schools. These local trainers will then foster human resources for farmers and dairy manufacturers, supporting the dispatch and retention of skilled professionals. For dairy manufacturers, Japanese expertise in milk quality management, food safety, and energy-saving equipment operation will be shared to strengthen on-site capabilities and quality assurance systems. This will enhance human resource capacity and competitiveness across the entire value chain, helping to build a foundation for the sustainable development of Ukraine's dairy sector.

Project Objective

To transfer Japanese knowledge and practices from farms and dairy manufacturers through technical cooperation, the project aims to develop human resources via local trainers, contributing to industry sustainability and the cultivation of the next generation of agricultural workers.

Beneficiaries

If the implementing association is the Association of Milk Producers of Ukraine, the target is its 150 member farms. If it is the Union of Dairy Enterprises of Ukraine, the target is its 46 member dairy manufacturers.

Implementing Agencies

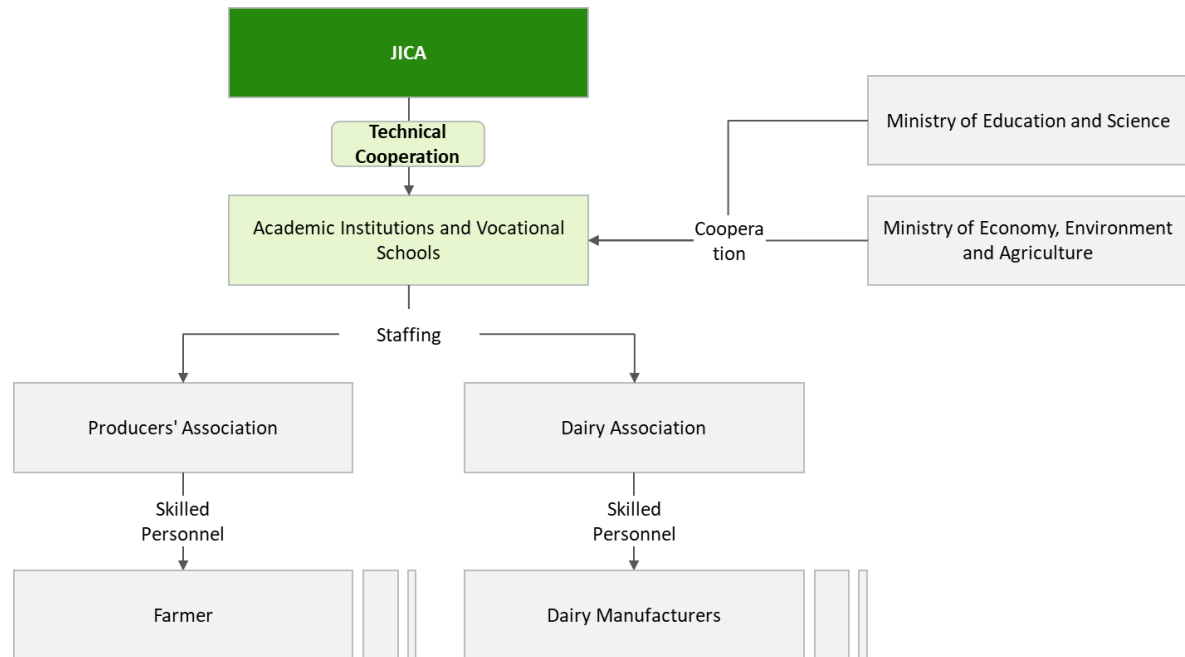
Academic institutions and vocational schools

Applicability of Japanese Technology

Japanese knowledge and practices developed in farms and dairy manufacturers can be transferred through experts affiliated with academic institutions and dairy-related organizations. These institutions have partnership agreements with JICA, making their cooperation highly likely for project implementation. The expertise held by these institutions and organizations covers the entire dairy value chain, from raw milk production to processing, quality control, and distribution, and is therefore applicable not only to farmers but also to dairy manufacturers. Specifically, the utilization of knowledge held by the institutions and organizations listed in Table 4.5.1 "Japanese Dairy-Related Academic Institutions and Organizations" is expected.

Other Considerations

- To ensure project sustainability, it is essential to establish fair and highly transparent business relationships between associations and their member farms and dairy manufacturers.
- It is necessary to continuously monitor security conditions and supply chain disruption risks resulting from the ongoing invasion, and to maintain flexibility in revising project plans as needed.



Source: JICA survey team

Figure4.5.3 Support for Human Resource Development in the Dairy Industry (Technical Cooperation Project)

CHAPTER5 MILK PILOT PROJECT

5.1 Overview

5.1.1 Background to Support for Dairy Farmers in Boryspil District

In 2025, Boryspil District requested support for small and medium-scale dairy farmers within the city. In response, four organizations—the Union of Dairy Enterprises of Ukraine, the National University of Life and Environmental Sciences of Ukraine, Swisscontact, and the Veterinary Alliance of Ukraine—joined forces to establish the Agro-Food Consulting Agency (hereinafter, the Consulting Agency) as a cluster provider responsible for supporting dairy farmers. This dairy pilot project is being implemented in collaboration with the Consulting Agency and aims to examine how Japan can support small and medium-scale dairy farmers in Ukraine through technological cooperation and human resource development. This chapter was prepared based on interviews with the Consulting Agency, as well as with dairy farmers and dairy processors located in Boryspil District.

In cooperation with the Union of Dairy Enterprises of Ukraine, Swisscontact has, since 2024, continued to support small and medium-scale farmers in the vegetable, berry, and dairy sectors in Chernihiv, Poltava, and Sumy Oblasts. Specifically, in partnership with five supply companies to expand resource and market access, it has conducted 40 trainings on technology and business development, provided support to craft producers 15 times, and plans to hold forums and compile an oblast-wide catalog. In parallel, it is strengthening public–private partnerships and developing support hubs for women entrepreneurs and farmers. Furthermore, it is establishing producer cooperatives in berries, vegetables, and beekeeping; developing a business model for the introduction of solar power for dairy; and strengthening cooperative know-how through a study tour in Lviv Oblast. It has also conducted three trainings on resource access and seeks to improve access to finance through the introduction of agricultural notes.

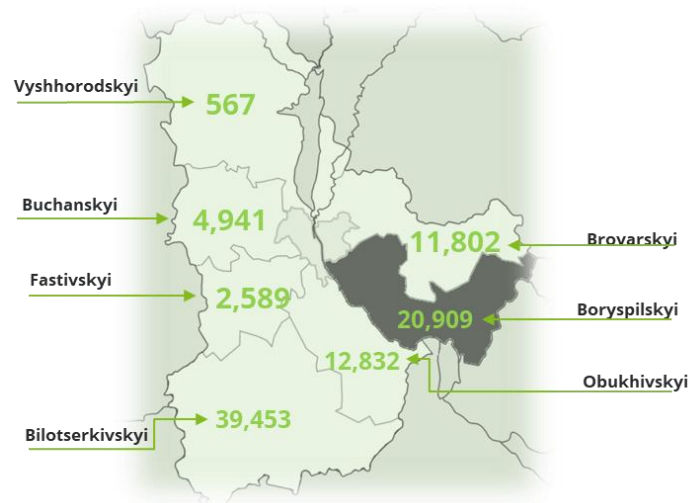
There are plans to extend these programs to Kyiv Oblast, with the aim of ensuring food security in the oblast and invigorating entrepreneurial activity in rural areas. The request from the City, combined with support from the respective institutions, led to the decision to implement the dairy pilot project at this juncture.

5.1.2 Overview of Livestock and Dairy in Boryspil District

Kyiv Oblast consists of seven cities. Among them, Boryspil District ranks second in the oblast in terms of the number of cattle kept by Enterprise farms—20,909 head as of November 2025—making it one of the key hubs of the oblast’s livestock industry. An analysis of the city’s dairy sector reveals a clear structure by farm type. There are 23 Enterprise dairy farms keeping 15,247 dairy cows in total, averaging about 663 cows per farm—predominantly large-scale operations. By contrast, there are 441 Household farms; however, the total number of dairy cows is 1,320, or approximately 2–3 cows per farm, indicating predominantly small-scale operations.

The main dairy processors with processing facilities in Boryspil District are Yagotynsky Butter Plant

(raw milk processing capacity of 370 tonnes per day) and Pereyaslav-Moloko (30 tonnes per day). Both belong to the Union of Dairy Enterprises of Ukraine.



Source: JICA survey team based on interview results

Figure5.1.1 Number of Cattle Kept by Enterprise Farms in Kyiv Oblast

Table 5.1.1 Number of Enterprise Farms and Number of Cattle Kept in Boryspil District

Herd Size	Enterprise Farmers	Number of Cattle	Number of Dairy Cattle	Number of Dairy Cow
1-50	5	61	60	38
51-200	4	613	612	217
201-500	3	1,022	1,016	450
501-1,000	6	4,407	4,175	1,785
>1,000	5	14,806	9,384	1,226
Total	23	20,909	15,247	3,716

Source: JICA survey team based on Interview Survey

5.1.3 Overview of Small- and Medium-Scale Enterprise Farms in Boryspil District

Based on the number of dairy cows kept, farms with fewer than 100 head are defined as “small-scale farms,” and those with 100 to fewer than 400 head are defined as “medium-scale farms.” Below is a detailed description of their characteristics and the management challenges they face.

(1) Small-Scale Enterprise Farms

The primary buyers of raw milk produced by small-scale farms are local dairy processors. However, pricing power resides with the dairy processors, leaving farmers with weak bargaining power. As a result, farm-gate milk prices are held at low levels, and many farms face profitability challenges.

To break out of this situation, some farms have begun to reduce reliance on shipments to dairy processors by processing their raw milk into higher value-added dairy products—such as cheese, butter, and yogurt—and developing their own sales channels by selling directly to local retailers.

It is rare for raw milk produced by small-scale farms to meet the highest grade, “Extra,” under Ukraine’s quality standards; much of it remains at “First,” two grades lower. Two main factors underlie this persistently modest quality.

First is the issue of feed balance. Due to low profitability, farms lack the economic capacity to purchase feed additives such as vitamins that enhance nutritional value. Consequently, they must rely on feeds composed of available ingredients—such as farm-grown corn and wheat and purchased sunflower cake—without achieving an optimal nutrient balance. This nutritional deficiency increases the risk of peripartum diseases and directly degrades raw milk quality.

Second is the problem of hygiene management. Although there is awareness of the need to comply with national sanitary requirements, a serious labor shortage makes it difficult to maintain close oversight during milking and calving. Insufficient staffing hampers proper care for each cow, keeping rates of mastitis and peripartum diseases high and further deteriorating raw milk quality.

Modernization of the production base tends to lag at small-scale farms. Many barns are continuations of structures built during the Soviet era, and core equipment—such as milking machines and milk pipelines—likewise shows advanced aging. The condition of this infrastructure makes it physically difficult to maintain sanitary conditions and contributes to higher disease risks, including mastitis—a structural factor behind persistently low milk quality. Investment in productivity-enhancing technologies is also limited. While some farms have introduced herd management software, the adoption of so-called smart livestock technologies—such as monitoring sensors that track each cow’s health status and activity in real time—has scarcely progressed.

Supplying raw milk for school meals has not materialized for small-scale farms. There are two major barriers. The first is price: procurement for school meals is conducted through a tender system that sets prices at low levels, and dairy processors tend to prioritize sourcing low-cost raw milk. Under these

conditions, it is difficult for small-scale farms to maintain profitability while continuing to supply at their attainable cost levels, and the lack of economies of scale works to their disadvantage. The second is quality: the quality standards required for school milk are high, including strict control of somatic cell count and total bacterial count, rapid cooling after milking, and maintenance of the cold chain. Meeting these requirements demands a commensurate level of capital investment and operational management that many small-scale farms have yet to achieve. These dual hurdles of price and quality make entry into the school meals market extremely difficult for small-scale farms at present.

(2) Medium-Scale Enterprise Farms

The main buyers of raw milk are dairy processors, and many farms have built stable supply relationships as contract farmers. Compared to small-scale farms, economies of scale allow them to achieve relatively lower production costs per unit of milk. Nevertheless, they still fall short of large-scale farms, and profitability remains an issue; many are aiming to increase herd size and improve production efficiency. A managerial feature is flexible decision-making in response to milk price fluctuations—for example, when prices fall, they may finish low-yield cows for sale as beef to maximize returns.

Although they employ elderly people and women, labor shortages are a serious issue on the production floor—particularly a shortage of male workers to handle physically demanding tasks such as barn cleaning, feeding, and moving cattle. By job category, the most acute shortfall is in daily animal caretakers.

The competitiveness of medium-scale farms is underpinned by rigorous production management systems. As a result, many such farms frequently meet the highest grade, “Extra,” under Ukraine’s quality standards.

Hygiene management is thorough. Some farms have resident veterinarians, and countermeasures and treatments for peripartum diseases and hoof diseases are conducted systematically. Manure handling is also systematized, with cleaning and removal methods adapted to the housing system (freestall/tie-stall). Collected manure is stored in designated areas and then reused as fertilizer on the farms’ own fields, implementing circular agriculture.

Owning relatively large tracts of land gives these farms a high degree of feed self-sufficiency, which is a source of cost competitiveness. Before sowing, they estimate annual feed requirements and secure buffer stocks to hedge weather-related risks, thereby enabling planned production. For nutrients that self-produced feed cannot supply—proteins (e.g., sunflower meal), vitamins, and minerals—they make planned purchases from external sources to optimize nutritional balance and effectively prevent metabolic diseases.

Production facilities are relatively modern. It is common to see milking parlors equipped with meters that automatically measure milk yield, as well as herd management software that integrates individual production and reproduction data. This enables data-driven, efficient farm management. On the other

hand, the adoption of more advanced smart livestock technologies—such as monitoring sensors that track each cow’s health status in real time—remains limited.

Medium-scale farms are the primary suppliers of milk for school meals because they can consistently meet tender requirements in terms of both procurement standards and quality. First, on quality, they continuously meet indicators such as high grading, low bacterial counts, and low somatic cell counts, underpinned by relatively advanced production management systems. Second, on cost, they leverage economies of scale to keep production costs within a certain range. Since dairy processors seek high-quality, low-cost raw milk, raw milk from medium-scale farms that satisfies both quality and price conditions is prioritized. The typical supply arrangement is to ship raw milk to partner dairy processors’ plants, where it is processed into the final product (milk) and then delivered to each school and kindergarten. On the processor side, there are no entry restrictions based solely on production volume; any raw milk that meets the quality and price thresholds can qualify as a supply source. Therefore, medium-scale farms that can stably meet quality standards and achieve a cost structure aligned with bid price ranges hold a relatively advantageous position in supplying milk for school meals.

5.2 Technical Validation toward Cluster Formation

5.2.1 Objective

Findings to date indicate that, while large-scale farms have achieved high profitability through modernization, small and medium-scale farms face investment constraints due to low profitability, are limited to producing lower-quality raw milk, and see their managerial stability undermined. Therefore, by matching primarily Japanese technologies and know-how to the challenges of small and medium-scale farms, we will validate applicability and identify candidate technologies and know-how. Specifically, we will conduct an applicability assessment of technologies and know-how centered on Japan.

5.2.2 Japanese Dairy Technologies That Address the Challenges of Ukraine’s Small and Medium-Scale Farms

We examine advanced Japanese dairy technologies that can help resolve the management challenges faced by Ukraine’s small and medium-scale farms. For the five Japanese dairy technologies listed below, we analyze their compatibility with concrete local needs and organize and consider their applicability and the key considerations for introduction.

Company	Technology	Overview of Technology	Overseas Expansion
Kohshin Engineering Co., Ltd.	Composting System	- Efficiently and rapidly carry out primary decomposition, volume reduction, and sanitization of livestock manure and other organic wastes by aerobic fermentation, thereby facilitating subsequent curing/composting and producing high-quality fertilizer. - Contributes to improving the efficiency of manure handling by dairy farmers and reducing the cost of purchasing fertilizers from outside.	- Already deployed in 43 countries, including Europe, with 80% of sales generated overseas. - In Europe, deployments more often target poultry than dairy cattle. - Full-fledged deployment to Ukraine is difficult under current circumstances, but we are open to collaboration if opportunities arise.
Desamis Co., Ltd.	Monitoring Sensors	- Collar- or tag-type sensors that monitor cattle activity and health 24/7 and automatically detect estrus and health abnormalities. - Contributes to more efficient herd management by dairy farmers.	Currently expanding mainly in Asian countries. In Europe, demonstrations were conducted in Denmark, a major dairy producer (however, they were interrupted by COVID-19).
Panasonic Environmental Systems & Engineering Co., Ltd.	Next-Generation Enclosed Barn System	- Provide a system that automatically optimizes the in-barn environment by combining fans, sensors, control units, and misting devices. - By managing temperature, humidity, and air quality, improves barn hygiene, reduces disease risks such as mastitis, and contributes to increased milk yield and improved reproductive performance.	- Not deployed overseas and limited to domestic installations. Currently, products deployed overseas are Panasonic Corporation's general-purpose commercial fans, not Panasonic Environmental Engineering's livestock-dedicated fans. - Exports are feasible by leveraging Panasonic Holdings' distribution network.
Enzyme Co., Ltd.	Humic Amendment	- Propose a drinking-water system that improves water quality and animal-health problems by suspending a humic amendment in the drinking tank and aerating. - As water quality improves, can contribute to better health through increased water intake by dairy cows. (Reference) Possesses technologies related to compost deodorization and wastewater treatment.	- Currently expanding mainly in Asian countries. - Participated as a supporting firm in the JICA project "Basic Survey on the Volume Reduction and Resource Recovery of Waste Sludge in Vietnam."
Ajinomoto Co., Inc.	Amino Acid-Balanced Feed	- Provide amino acid-balanced feed that optimally balances the amino acids required for growth and milk yield. - Improves feed efficiency and, by suppressing the discharge of excess nutrients, reduces dairy farms' environmental footprint and feed costs; also contributes to maintaining cow health.	Installed at multiple dairy farms in Europe.

Source: JICA survey team based on Interview Survey

Figure 5.2.1 Japanese Dairy Technologies Targeted for Technical Validation

(1) Kohshin Engineering Co., Ltd. (Composting System)

The composting system¹⁵⁹ developed by Kohshin Engineering Co., Ltd. (hereinafter, Kohshin Engineering) is designed to rapidly and stably process organic waste—such as livestock manure and food residues—through highly controlled aerobic fermentation. The system integrates the entire sequence of processes, from pretreatment (e.g., crushing and mixing), to aeration and agitation control within the reactor, continuous monitoring of temperature and humidity, and deodorization and exhaust treatment. This configuration enables operators to set optimal operating conditions tailored to the characteristics of the input materials (e.g., moisture content, C/N ratio) and to suppress quality variability. As a result, it can consistently produce homogeneous, sanitary organic fertilizer with very high soil-improvement efficacy and application safety. In addition, its enclosed structure and advanced deodorization functions minimize odor-related impacts on the surrounding environment, contributing to local resource circulation and reductions in greenhouse gas emissions. Automated monitoring and control reduce labor requirements and are expected to support sustained, stable operation.

Effective utilization of livestock manure remains a major challenge for small and medium-scale farms in Ukraine. At many farms, manure is collected and stored, then applied as fertilizer to in-house feed grain fields; however, this practice tends to result in the use of immature compost, limiting benefits to

¹⁵⁹ Homepage of Kohshin Engineering Co., Ltd. <https://www.kohshin-s.jp/>, (Accessed 2026-03-25).

soils and crops. Consequently, overall fertilization is often insufficient, and many farmers purchase expensive chemical fertilizers to make up the shortfall. While some large farms have introduced biodigesters to convert manure into energy, such systems are unlikely to be realistic options for small and medium-scale farms given the costs of introduction and the operational scale required.

Many small and medium-scale dairy farms are inferred to be facing serious management challenges stemming from declining profitability amid rising production costs. The introduction of Kohshin Engineering's composting system could provide an effective solution to this problem. By self-producing high-quality organic fertilizer using this system, farms can, first, directly reduce expenditures on externally purchased chemical fertilizers. Second, stable, high-quality organic fertilizer improves the physical and chemical properties of soils and contributes to higher crop yields. This, in turn, can raise feed self-sufficiency and further reduce purchased feed costs, with the potential to significantly improve farm profitability. In light of these economic benefits, potential demand for this system is judged to be very high.



Source: Kohshin Engineering Co., Ltd. 「KNLL Composter」 (<https://www.kohshin-s.jp/product-jp/%e7%99%ba%e9%85%b5%e6%99%9f/>)

Figure5.2.2 Composting System

(2) Desamis Co., Ltd. (Monitoring Sensors)

U-motion¹⁶⁰ from Desamis Co., Ltd. (hereinafter, Desamis) is an advanced behavior-monitoring service that combines a compact, cow-worn sensor with cloud-based AI analytics. From accelerometry and related data collected by the sensor, the system precisely infers each animal's activities—such as feeding, rumination, standing/lying, and walking—around the clock. The AI analyzes these behavioral patterns, automatically detecting subtle changes that indicate estrus or early signs of disease, and immediately pushes alerts to managers' smartphones or PCs. This reduces missed heats and shortens days open, minimizes losses through earlier detection and treatment of disease, and delivers substantial labor savings in observation while leveling day-to-day workloads. Technically, data are aggregated from barns or pastures over low-power wide-area (LPWA) wireless to a gateway and transmitted to the cloud; ruggedized sensors and long-life power supplies minimize day-to-day operating burden. The accumulated data can become a critical management asset that supports both productivity improvement

¹⁶⁰ Homepage of Desamis Co., Ltd. <https://www.desamis.co.jp/>, (Accessed 2026-03-25).

and animal welfare.

Amid worsening labor shortages, small and medium-scale dairy farms in Ukraine urgently need to move beyond traditional husbandry management based on visual observation. In reproductive management in particular, reliance on visual heat detection leads to frequent missed nighttime heats and misinterpretation of signs, depressing reproductive performance and straining farm finances. While some large farms are adopting smart livestock technologies, diffusion among small and medium-scale farms has lagged due to upfront costs and operational know-how barriers, widening productivity gaps. Under these circumstances, there is very high potential demand for technologies that can substitute for observational labor and improve reproductive performance based on objective data.

Introducing U-motion directly addresses these challenges. By deploying the system, overall husbandry management can be streamlined and the time saved can be reallocated to higher value-added, animal-specific care tasks. For veterinarians as well, objective time-series data—such as activity levels and rumination time—are likely to be extremely useful inputs for improving diagnostic accuracy and determining treatment strategies.



Wearable Sensors for Comprehensive Livestock Monitoring

U-motion® is a comprehensive system for monitoring cattle behavior, designed to enhance livestock management. The system consists of wearable sensors attached to the neck, a receiver for data reception, and software accessible from computers or smartphones (no installation required, internet connection necessary). U-motion® supports farmers by alerting them to abnormalities in real time.

U-motion® resolves challenges in the following ways

Reducing days open to enhance productivity.	Minimize treatment costs and milk yield losses.
Being prepared for calving anytime.	Simplifying information management.
Identifying cows to be aware of.	Reducing calf illness and mortality.

Source: Desamis Co., Ltd. 「U-motion」 (<https://www.desamis.co.jp/u-motion-lp-01>)

Figure5.2.3 U-motion

In addition, the new animal welfare standards¹⁶¹ that came into force in Ukraine in January 2026 provide a strong boost to the adoption of this technology. These standards impose obligations on farmers to regularly monitor animal health, provide timely veterinary care, and maintain detailed records of treatments, mortality, changes in health status, and preventive interventions. U-motion is an optimal solution for automatically delivering the legally required continuous health monitoring and objective recordkeeping, and, from a compliance standpoint, the need for adoption among small and medium-scale dairy farms is expected to increase further.

Animal Welfare Standards
• Livestock facilities and animal environments must ensure conditions that meet physiological and behavioral needs, including space, lighting, ventilation and indoor microclimate. • Animals must have continuous access to appropriate feed and water. • Practices that cause unnecessary suffering or restrict natural behavior are prohibited. • Keepers are obliged to monitor animal health regularly, provide timely veterinary care, and maintain detailed records of treatments, mortality, health changes and preventive interventions. • Staff working with animals must receive appropriate training on welfare requirements.
Background and Objectives of Implementation
• Animal health and welfare outcomes, contributing to reduced disease, stress and mortality in livestock. • Food safety and quality, building trust for local and international consumers. • Trade relations, by laying groundwork for deeper integration with EU agricultural markets and supply chains. • Business transparency, as compliance is documented and becomes part of official control systems.

Source: JICA survey team based on Agroberichten Buitenland (<https://www.agroberichtenbuitenland.nl/actueel/nieuws/2026/01/05/ukraine-implements-eu-aligned-animal-welfare-standards-from-1-january-2026>)

Figure5.2.4 Order No. 224 of 8 February 2021, “On the approval of requirements for the welfare of agricultural animals during their keeping”

(3) Panasonic Environmental Systems & Engineering Co., Ltd. (Next-Generation Enclosed Barn System)

The next-generation enclosed barn system¹⁶² developed by Panasonic Environmental Systems & Engineering Co., Ltd. (hereinafter, Panasonic Environmental Systems & Engineering) is a comprehensive environmental solution based on a sealed structure that isolates the interior from external conditions and uses advanced mechanical ventilation and HVAC technologies to optimally control temperature, humidity, airflow, and lighting throughout the year. By integrating high-efficiency heat-recovery ventilation, mist cooling, and insulating curtains under unified control, the system minimizes heat and cold stress on cattle, stabilizes feed intake and milk yield, and directly contributes to maximizing productivity. In addition, the system centrally captures exhaust air and treats it through multi-stage processes—such as biological deodorization and chemical scrubbing—to minimize odor and dust impacts on the surrounding environment. A range of sensors is linked to a cloud-based monitoring

¹⁶¹ Agroberichten Buitenland. “Ukraine implements EU-aligned animal welfare standards from 1 January 2026”. 2026-01-05. <https://www.agroberichtenbuitenland.nl/actueel/nieuws/2026/01/05/ukraine-implements-eu-aligned-animal-welfare-standards-from-1-january-2026>, (Accessed 2026-03-25).

¹⁶² Homepage of Panasonic Environmental Systems & Engineering Co., Ltd. <https://panasonic.co.jp/hvac/peseng/technology/solution/06/>, (Accessed 2026-03-25).

platform that continuously visualizes parameters such as the Temperature-Humidity Index (THI) and ammonia concentration, enabling rapid remote responses in the event of anomalies. The design emphasizes energy efficiency, supporting sustainable operations.

One of the most pressing issues facing Ukraine's small and medium-scale farms is the high incidence of diseases during the transition period, particularly around the peripartum stage. At the root of this problem is stress from inadequate housing environments that suppresses immune function. Enhancing bovine comfort—i.e., improving animal welfare—requires secure, clean resting areas and, above all, better air quality within barns. However, many existing barns rely on natural ventilation and, due to their small size, face structural constraints that prevent adequate airflow. As a result, elevated ammonia concentrations and stagnant humidity are common, increasing the risk of respiratory diseases and creating persistently poor sanitary conditions.

Symptomatic measures such as simply adding ventilation fans have inherent limitations. Ukraine's continental climate exposes cattle not only to summer heat but also to severe subzero winter cold, both of which impose significant stress and markedly hinder productivity. Given the need to maintain optimal thermal conditions year-round and to ensure clean air quality, there is extremely high potential demand for enclosed barn systems that can actively control the internal environment irrespective of outside conditions. Panasonic's system can substantially reduce both heat and cold stress and fundamentally improve sanitary conditions, thereby contributing significantly to reducing transition-period diseases and stabilizing productivity throughout the year. This constitutes a highly effective investment toward improving farm profitability and achieving sustainable dairy operations.



Source: Panasonic Environmental Systems & Engineering Co., Ltd. 「Livestock environmental solutions」
(<https://panasonic.co.jp/hvac/peseng/technology/solution/06/>)

Figure5.2.5 Next-Generation Enclosed Barn System

(4) Enzyme Co., Ltd. (Humic Amendment)

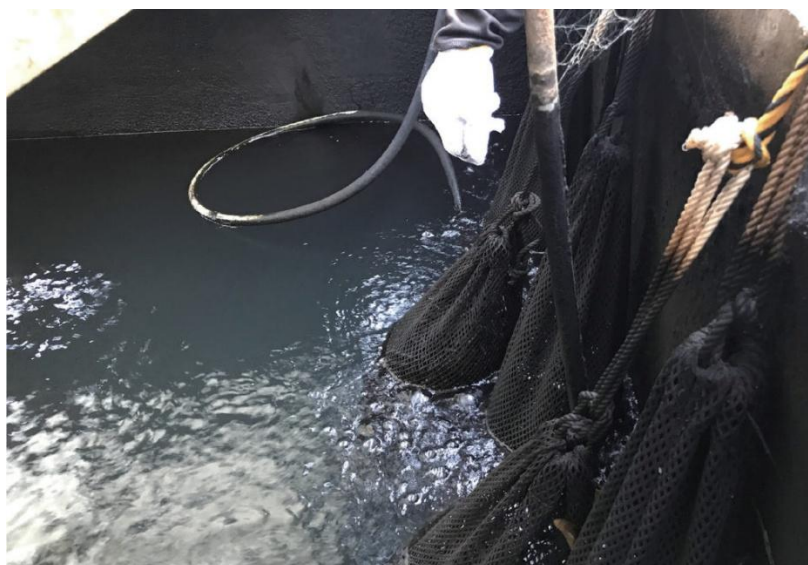
The humic amendment¹⁶³ provided by Enzyme Co., Ltd. (hereinafter, Enzyme) is a multifunctional soil and livestock-environment conditioner whose main components are humic and fulvic acids

¹⁶³ Homepage of Enzyme Co., Ltd. <https://www.enzyme.co.jp/service/4483/>, (Accessed 2026-03-25).

extracted from natural minerals such as leonardite. The material delivers a range of effects depending on the application. As a soil amendment, it promotes the formation of soil aggregates and increases cation exchange capacity (CEC), thereby enhancing water- and nutrient-holding capacity and supporting healthy crop growth. As a feed additive, when used in preparing silage and fermented total mixed rations (TMR), it promotes the activity of lactic acid bacteria, stabilizes fermentation quality, and helps preserve nutritional value. Particularly noteworthy is its use for improving drinking water. The strong chelating action (metal-ion sequestration) and buffering capacity of its principal component, fulvic acid, play an important role in addressing water-quality issues.

Many of the water sources used by Ukraine's small and medium-scale dairy farms pose a water-quality challenge in that they are too hard for livestock drinking. Hard water has a distinctive taste due to calcium and magnesium ions, markedly reducing palatability for cattle. As a result, water intake declines, leading to mild dehydration and reduced feed intake, which ultimately become serious productivity constraints in the form of lower milk yield and poorer health status. At present, many farms have not implemented effective countermeasures, and improving the drinking-water environment is recognized as an urgent management issue for boosting productivity.

Against this backdrop, there is extremely high demand for water-quality improvement technologies that can increase cattle water intake. Enzyme's humic amendment could be an effective solution to this problem. When added to drinking water, the chelating action of fulvic acid can bind and sequester excess mineral ions that cause hardness, improve water taste, and increase water intake by cattle. Compared with large-scale water-treatment or softening equipment, this material has lower introduction costs and is simple to operate, making it a realistic option even for capital-constrained small and medium-scale farms. Accordingly, the potential for adoption of this material—which directly improves productivity and animal health—is judged to be very high.



Source: Enzyme Co., Ltd. 「Humic water spraying, drinking water and auxiliary feed system」 (<https://www.enzyme.co.jp/service/4483/>)

Figure5.2.6 Humic Amendment

(5) Ajinomoto Co., Inc. (Amino Acid–Balanced Feed)

Ajinomoto Co., Inc.’s amino acid–balanced feed¹⁶⁴ is an advanced nutritional management technology that reconciles maximization of livestock productivity with reduced environmental impact, based on the “ideal protein” concept. At its core, high-purity, feed-grade amino acids produced by fermentation (e.g., lysine, methionine) are precisely added to rations so that, while restraining overall crude protein levels, the animal’s requirements for essential amino acids are met without excess or deficiency according to growth stage and production goals. In dairy cows, the use of rumen-protected amino acids that escape degradation in the rumen and are absorbed in the small intestine enables efficient supply of limiting amino acids such as lysine and methionine, contributing significantly to increased milk yield and milk protein. By avoiding excess nitrogen intake, this approach greatly reduces nitrogen excretion from manure and ammonia emissions, thereby lowering environmental impact. At the same time, it reduces dependence on costly protein ingredients (e.g., soybean meal) and increases formulation flexibility, helping to cut feed costs and mitigate raw material price volatility.

Although many small and medium-scale farms in Ukraine self-produce a large portion of their feed, its nutritional value is not necessarily optimized, with particular issues in both the quantity and quality of protein (i.e., amino acid balance). Prices for feed additives—vitamins, minerals, and high-quality amino acid preparations—have surged, making stable procurement difficult for capital-constrained small and medium-scale farms. As a result, rations at many farms are nutritionally imbalanced, with chronic shortfalls in essential amino acids that are critical for milk production. This nutritional deficiency directly leads to lower milk yield and poorer milk components, while imposing significant metabolic stress on cows and markedly increasing the risk of peripartum diseases.

Under these circumstances, Ajinomoto’s amino acid–balanced feed technology could be a highly effective solution to the profitability challenges facing Ukraine’s small and medium-scale farms. By precisely supplementing the most deficient essential amino acids, it can dramatically improve overall nutrient utilization efficiency. This boosts feed efficiency and curbs unnecessary intake, yielding a direct reduction in feed costs. Furthermore, improved nutritional status raises milk yield and quality while lowering disease risk, directly enhancing farm income. Accordingly, this technology—offering high returns for modest investment—has the potential to fundamentally improve farm profitability, and potential demand is judged to be extremely high.

¹⁶⁴ Homepage of Ajinomoto Co., Inc. <https://www.ajinomoto.co.jp/amino/sustainability/shokuniku.html>, (Accessed 2026-03-25).

**Improve Cattle Nutrition with Amino Acid and
Contribute to Reduction of Greenhouse Gases Emissions and Feed Costs
AjiPro®-L, Lysine Formulation for Cattle**

We introduce the Customized Feed Solution (CFS) Dept. of the Bio & Fine Chemicals Division produces *AjiPro®-L*, a formulation for cattle with the amino acid lysine.

AjiPro®-L is a formulation that can be added to cattle feed to supplement the essential amino acid lysine, which cattle tend to be deficient in, and improve the amino acid balance in feed. Production and sales began in North America in 2011 and sales in Japan began in 2015.

Currently, *AjiPro®-L* is used around the world and has the largest market share (according to our research) of lysine formulations for cattle.



This product is currently attracting a lot of attention from dairy and beef farmers, as well as the dairy and meat manufacturers around the world, because it reduces both greenhouse gas (GHG) emissions from the cattle and feed costs while maintaining and improving cattle productivity, by balancing the amino acids in cattle feed.

Source: Ajinomoto Co., Inc. 「Improve Cattle Nutrition with Amino Acid and Contribute to Reduction of Greenhouse Gases Emissions and Feed Costs *AjiPro®-L*, Lysine Formulation for Cattle」 (https://www.ajinomoto.co.jp/company/en/ir/news/news-20250424/main/0/link/202504_IRTopics_CFS_AJIPRO-L_E.pdf)

Figure5.2.7 Amino Acid–Balanced Feed

5.2.3 Applicability of Japanese Dairy Technologies

Based on the analysis in the preceding sections, we formulated the hypothesis that each Japanese dairy technology has high potential to help solve the challenges faced by Ukraine’s small and medium-scale farms and that there is actual demand for introduction locally. This section organizes the results of our verification of that demand and the applicability of each technology, drawing on insights gained through the actual technology matching process.

(1) Kohshin Engineering Co., Ltd. (Composting System)

In the course of technology matching, we confirmed that many Ukrainian dairy farms self-produce feed and other crops, and a clear need emerged for systems to return organic resources, including manure, to farmland—that is, for the effective use of fertilizers. Against the backdrop of persistently high chemical fertilizer prices and the adoption of organic cultivation at some farms, the orientation toward organic fertilizers is strengthening, and the demand for composting systems is assessed as high. Furthermore, with a view to future EU integration, regulatory and policy support could further advance organic cultivation and resource circulation, making the necessity and profitability of composting even stronger over the medium to long term. With this external environment and nascent demand as a premise, we next examined the economic feasibility of introduction and concrete deployment models.

To consider the application of this system, we first identified the business scale at which it is economically viable. While Kohshin Engineering offers a diverse product lineup capable of handling manure from herds of 150 to 2,500 head, a model that processes manure from roughly 800 to 1,000 head

is considered to offer the greatest economic rationality in terms of investment payback and business sustainability. Based on this premise, technology matching confirmed that there are two main introduction models.

The first is a direct-introduction model for large-scale farms; large dairy farms with 1,000 head or more, capable of meeting the scale requirements on their own, are the most promising candidates for direct adoption. For example, Astarta-Kyiv¹⁶⁵, a major agricultural enterprise in Kyiv Oblast including Boryspil District, operates both large dairy and extensive cropping divisions, allowing it to effectively use high-quality compost produced in-house on its own fields—an ideal model case for maximizing the benefits of introduction.

The second is a regional circular collaborative business model. To ensure that the benefits of this technology accrue to small and medium-scale farms, rather than pursuing stand-alone introduction, it is essential to build a model that collects manure from multiple farms, composts it centrally, and redistributes it. Potential operators for this model include the city's manure treatment facility, large dairy farms in the city, dairy processors in the city, cooperatives in the city, and agroholdings. The next task is to evaluate geographic aggregation efficiency and each candidate's level of interest in the project, and to select the most feasible partner and pilot area.

Introducing this system contributes to improved profitability on multiple fronts. The main benefits are as follows. Direct benefits include reducing the cost of purchasing increasingly expensive chemical fertilizers. In addition, applying high-quality organic fertilizer improves the physical and chemical properties of soils, increases crop yields, and raises feed self-sufficiency, yielding secondary effects such as lower purchased feed costs. The greatest added value from adopting this technology is the potential to generate a new revenue stream through carbon credits. In technology matching, Kohshin Engineering's technology was identified as a greenhouse gas (GHG) reduction methodology registered under the Gold Standard¹⁶⁶, and a demonstration project in the Netherlands confirmed a reduction effect of 8.8 tonnes CO₂e per head per year. Assuming a sales price of USD 30 per credit, this would amount to approximately USD 264 per head per year—an additional revenue of non-negligible scale. This could significantly shorten the investment payback period and become a decisive factor in substantially enhancing the economic appeal of the project.

On the other hand, introducing the system requires clearing physical and legal constraints. Installation of a composting system presupposes securing a site of sufficient size and selecting a location that takes into account the surrounding environment in terms of odor and sanitary management. Specific candidate sites include co-location with existing manure treatment facilities and idle land owned by large farms or dairy processors. In all cases, compliance with relevant Ukrainian laws and regulations—including waste management laws, environmental standards, and sanitary standards—is essential. Therefore, prior

¹⁶⁵ Astarta-Kyiv. <https://astartaholding.com/en/kontakti-kompanij/>, (Accessed 2026-04-02).

¹⁶⁶ Gold Standard. <https://globalgoals.goldstandard.org/documents/methodology/>, (Accessed 2026-04-02).

to full-scale commercialization, it is indispensable to confirm the requirements and procedures for obtaining permits and approvals through consultations with the competent authorities.

(2) Desamis Co., Ltd. (Monitoring Sensors)

During the technology matching process, it became clear that amid worsening labor shortages, small and medium-scale dairy farms have a strong need to reduce labor for observation tasks and to improve reproductive performance. At present, reproductive management centers on visual behavioral observation, making missed heats and misinterpretation of signs likely. By contrast, leveraging Desamis's monitoring technology would streamline husbandry management and allow time saved to be reallocated to attentive, animal-specific care, confirming high demand for the introduction of monitoring sensors. Taking into account both challenges and needs, we examined the applicability of, and rollout scenarios for, Desamis's behavior monitoring service U-motion in the Ukrainian market as the next step.

From a market perspective, verification found that Western competitors are already present in Ukraine, including the Dutch company UNIFORM-Agri¹⁶⁷, and a certain market has already formed. While this evidences demand for such technologies, it also implies a challenging competitive environment for U-motion. Differentiation from competitors is indispensable for success; technology matching indicated that the combination of an accelerometer and a barometric pressure sensor could be the key. This configuration is expected to detect signs of imminent calving with higher precision than competing products. However, careful market research and testing are needed to determine whether this technological advantage provides a sufficiently strong incentive for farmers already accustomed to operating specific products to switch.

Next, we considered target users and economics. From the perspectives of introduction effect and return on investment, medium-scale farms with 200 to 400 head are considered the optimal target segment. However, this segment is also the main battleground for competitors, and some price competition is expected. Therefore, rather than engaging in a simple price war, a strategy is needed to build competitive advantage on total value—emphasizing added values such as Japanese product quality and robust support systems. As a sales channel, partnering with dairy processors that have a strong interest in animal welfare could be an effective option, but careful partner selection remains important in light of competitors' moves.

With respect to technical and environmental fit, the prerequisites for introduction are met. It was suggested through technology matching that U-motion's algorithms are compatible with Holstein cattle, the main breed in Ukraine, and that freestall housing—recommended for adoption—is on the rise domestically, both of which are favorable factors that reduce barriers to introduction.

In sum, while entry into the Ukrainian market for U-motion enjoys tailwinds in the form of solid demand and technical fit, it also faces the harsh reality of strong, established competitors.

¹⁶⁷ UNIFORM-Agri. <https://www.uniform-agri.com/en/about-us/>, (Accessed 2026-04-02).

(3) Panasonic Environmental Systems & Engineering Co., Ltd. (Next-Generation Enclosed Barn System)

Through technology matching, we found that under the new animal welfare standards that took effect in January 2026 in Ukraine, farmers are required to ensure that “livestock facilities and the animal environment secure conditions—such as space, lighting, ventilation, and indoor microclimate—that satisfy physiological and behavioral needs.” These standards strongly call for improvements to livestock sanitary environments and provide a major tailwind for adopting enclosed barn systems. As a result, the necessity of introduction among small and medium-scale farms has increased further.

In light of this requirement and on-site needs, we evaluated the applicability of Panasonic Environmental Systems & Engineering’s next-generation enclosed barn system from both the standpoint of technical superiority and of introduction scale and format. As a situational assessment, technology matching clarified that, apart from some advanced large-scale farms, open-type or tunnel-type barns prevail on Ukrainian dairy farms. While these conventional barns use natural ventilation due to their open structures, performance depends on external wind direction and speed, and structural defects make uneven air circulation within the barn likely. In open-type barns in particular, the intake of fresh air and exhaust of contaminated air are inefficient, causing odor concentrations to rise and stagnant air to be dispersed disorderly by external wind. Tunnel-type barns form a unidirectional air path, but the long ventilation route degrades air quality toward the leeward side, resulting in sanitary nonuniformity in cow resting areas.

By contrast, Panasonic Environmental Systems & Engineering’s enclosed barn system provides a fundamental solution to these issues. In a sealed space isolated from external conditions, the system uses mechanical ventilation to create uniform airflow throughout the barn. By designing short ventilation distances and continuously exchanging air with clean outside air, it maintains low concentrations of harmful gases and odors such as ammonia while discharging contaminated air in a planned, single direction. This enables cows to enjoy comfortable conditions anywhere in the barn and markedly reduces deterioration in sanitary conditions and associated disease risks.

The recently introduced animal welfare standards in Ukraine, which strongly call for improving livestock sanitary environments, are a strong tailwind for this system’s adoption. Distinct from symptomatic measures such as installing individual fans, this system builds an optimal husbandry environment on a continuous basis—precisely the solution demanded by the standards. Technology matching also confirmed high compatibility with local husbandry practices, including full support for the freestall system requested locally, which allows cows to move freely. While local farmers currently procure standalone equipment such as fans from European and Chinese manufacturers, this system can differentiate itself in the market as a comprehensive environmental control solution—not merely an equipment supply—and as a “Japanese product” known for high quality and reliability; its applicability is therefore concluded to be extremely high.

Regarding scale and format, there are installation track records in Japan for farms with as few as 80

head, meaning the system is not limited to large-scale farms. In addition to full system packages, individual barn-environment components (high-efficiency fans, ventilation control systems, fine-mist cooling, livestock heaters, etc.) can be introduced in stages. This flexibility allows small and medium-scale farms wishing to limit initial investment to advance environmental improvements step-by-step according to their management situation and priority issues—an indicated point of differentiation from similar European and Chinese equipment based on technology matching.

(4) Enzyme Co., Ltd. (Humic Amendment)

In the technology matching process, we confirmed issues at small and medium-scale Ukrainian dairy farms such as poor water quality stemming from groundwater use and reduced water intake due to hard water. Against this backdrop, it was suggested that there may be high demand for the introduction of humic amendments. Responding to these on-site needs, we conducted a multifaceted evaluation of the applicability of Enzyme's humic amendment from four perspectives—cost, technology, environment, and certainty of effect—and organized an introduction scenario.

Cost-wise, the product is judged to be priced within a range sufficiently accessible to small and medium-scale farms and to have high economic rationality. The drinking-water issues faced by Ukrainian farmers largely fall into two categories: deterioration in water quality due to aging infrastructure, and reduced drinking appetite caused by high mineral and iron content intrinsic to water sources. Existing water-quality improvement devices addressing the latter are expensive and, in practice, limited to capital-rich large-scale farms. By contrast, Enzyme's humic amendment can improve the drinking-water environment at low cost, and technology matching confirmed that the investment level is realistic for small and medium-scale farms. Initial interviews also indicated that this cost level is acceptable, suggesting low economic barriers to introduction.

When examining technical and environmental applicability, however, we identified non-negligible constraints and uncertainties alongside the ease of introduction. Implementation is extremely simple—placing the material in a net and suspending it in a storage tank—and it can leverage the local practice of storing well water in tanks. Nevertheless, the product's optimal operating water temperature is around 20°C, and efficacy drops markedly below 15°C. Under Ukraine's climate, where water temperatures can fall below freezing in severe winter, additional capital and operating costs—such as heating storage tanks—may be required to ensure stable year-round effectiveness, potentially undermining the product's cost advantage. A more fundamental issue is that the degree to which the product can improve the specific water-quality problem of high mineral and iron content remains unverified; it does not guarantee direct resolution of the problem.

At the same time, the technology matching process locally revealed a promising application area different from the initial assumption: use as an odor countermeasure for compost. This application is not subject to strict environmental conditions such as water temperature and offers higher certainty of effect, substantially lowering the threshold for introduction. Based on the above analysis, application for the original purpose of drinking-water improvement is a medium- to long-term theme requiring resolution

of two challenges—demonstrating effectiveness and addressing low temperatures in winter. Therefore, the most practical and strategic approach is first to enter the market in the compost odor-control application, where demand is confirmed and environmental constraints are absent, and to build product credibility before expanding.

(5) Ajinomoto Co., Inc. (Amino Acid–Balanced Feed)

During technology matching, we confirmed that while some feed without additives is self-produced by dairy farmers—making the impact of rising feed prices relatively small—the share of feed costs in total costs remains high at 60–70%. For small and medium-scale dairy farms with low profitability, there is strong demand for amino acid–balanced feed that can reduce feed costs.

In applying amino acid–balanced feed, it is first necessary to consider compatibility with current conventional rations. By replacing part of the protein sources in typical rations with amino acids, amino acid–balanced feeding is expected to reduce both feed costs and greenhouse gas (GHG) emissions. Consequently, the higher the crude protein (CP) content of the ration, the easier it tends to be to introduce. Technology matching found that Ukraine’s average CP is 16.8–17.5%, slightly higher than Japan’s feeding standard for lactating cows (16.3%), suggesting good suitability for introduction. On the other hand, some small and medium-scale farms may not feed large amounts of concentrates, resulting in lower-than-average CP. In such cases, there is less room to reduce CP and effects may be limited, necessitating evaluation based on actual ration formulation data. Generally, soybean meals used in cattle feed—is high in protein but expensive and tend to contain excess amino acids. A typical approach is to reduce soybean meals and similar ingredients in the formulation and supplement deficient essential amino acids to optimize the amino acid balance of the ration. In Ukrainian dairy production, rapeseed meal and soybean by-products are prioritized as protein sources, while soybean meal is mainly exported and thus expensive, limiting its use in formulations. If the amino acid profile of soybean by-products is comparable to that of soybean meal, ration design is more likely to be suitable for introducing amino acid–balanced feeding.

Next, we considered acceptance at the time of introduction. Small and medium-scale Ukrainian dairy farms have a high ratio of self-produced feed and design rations flexibly by combining available ingredients according to season and procurement conditions, making them relatively open to changes. Conversely, some farmers exhibit resistance to reducing concentrates due to the recognition that high-energy feed is important for securing milk yield and maintaining health. However, if the concept of amino acid–balanced feeding is communicated carefully and understanding advances that performance will not suffer even with partial reduction of protein sources, it is expected to be broadly accepted. Since farmers often seek advice from veterinarians and nutritionists on ration formulation, involving these stakeholders is expected to facilitate dissemination.

5.2.4 Organizing Key Considerations for Introducing Japanese Dairy Technologies

Synthesizing the applicability of Japanese dairy technologies, Kohshin Engineering’s composting

system is a highly novel solution with few competitors in Ukraine, and—provided an economically viable processing scale is designed and suitable installation sites are secured—its introduction feasibility has been verified as extremely high. Desamis’s behavior monitoring service U-motion has room for technical differentiation through sensor configuration; however, given that Western products are already widely deployed, clarifying short-term superiority will be difficult and careful market validation is required. Panasonic Environmental Systems & Engineering’s next-generation enclosed barn system can differentiate itself through integrated environmental control that continually ensures cattle comfort and hygiene and reduces disease risk, and—being customizable in a phased, modular manner for small and medium-scale farms while aligning with the local freestall-dominant husbandry style exhibits high suitability for introduction. Enzyme’s humic amendment is economically acceptable in terms of cost, but climate and environmental constraints raise concerns about seasonal variability in effect; moreover, given that improvement effects for fundamental water-quality issues such as high mineral and iron content remain unverified under local conditions, applicability at this time is unclear. Ajinomoto’s amino acid-balanced feed faces strong potential demand for ration redesign; however, whether there is room to reduce CP needs to be verified based on the actual ration designs of individual dairy farms.

In light of the above, it is appropriate to prioritize Kohshin Engineering’s composting system and Panasonic Environmental Systems & Engineering’s next-generation enclosed barn system for organizing concrete introduction issues, as these have the highest implementation certainty. As details of each amount are confidential, they are not included in this report.

(1) Kohshin Engineering Co., Ltd. (Composting System)

To ensure that the benefits of this technology accrue to small and medium-scale farms, it is essential to build a regional circular collaborative business model that aggregates manure from multiple farms, composts it centrally, and redistributes it. Potential operators of this model include the city’s manure treatment facility, large dairy farms in the city, dairy processors in the city, cooperatives in the city, and agroholdings. Feasibility should be examined considering each candidate’s strengths and challenges.

First, the option of designating Boryspil District’s manure treatment facility as the operator offers the major advantage of co-location with an existing site, which can have relatively lower hurdles for installation work and permits. Because it can be co-located at a collection hub, the burden of building new collection routes is limited, and flexibility to accept inputs from species other than dairy cattle facilitate smoothing of throughput and ensures utilization rates. If municipally operated, it is highly suitable for launch as a JICA project, with advantages in terms of publicity and transparency. On the other hand, if the facility already processes feedstock through spreading liquid fertilizer or other projects, competition for inputs may arise, constraining additional feedstock procurement. Furthermore, if many dairy farms already return manure to their own fields, inputs may not be gathered unless transport incentives to the facility are designed; success will hinge on institutional design for elements such as intake pricing, transport subsidies, and preferential allocation of compost.

Next, making a large dairy farm in the city the operator would provide high feedstock stability, as a

certain volume of manure can be secured in-house; room to accept co-inputs from pigs, poultry, and beef cattle would also allow greater freedom in compost quality design. The existence of extensive in-house farmland to which in-house compost can be returned offers strong cash-flow certainty and the prospect of earlier realization of benefits. However, it would be necessary to establish a new system to introduce and operate composting equipment, and additional operations—sanitary and environmental management, as well as external feedstock collection and compost redistribution—would impose a non-negligible operating burden. Moreover, in forming a JICA project, a framework via the municipality or government would be required, raising issues of how to ensure publicity and broad distribution of benefits.

The option of designating a dairy processor in the city as the operator promises stable feedstock collection backed by a network of contract farms, and logistics for collection and redistribution of compost could be integrated by leveraging existing milk collection routes—making for rational operational design. For companies that set animal welfare and environmental-impact reduction goals across the supply chain, this can be a model that reconciles support for contract farms with visibility into sustainability. However, processors are not direct users of compost, creating a structural challenge in elevating internal investment priority. New responsibilities for sanitary and environmental management would also arise with new equipment introduction and operation; to assemble it as a JICA project, securing publicity in collaboration with the municipality and government is indispensable. To raise corporate incentives, quantitative design of benefits—such as brand value enhancement, contributions to productivity and cost reduction at contract farms, and distribution of carbon credit revenues—will be necessary.

The cooperative-led option would leverage the membership network to facilitate aggregation of inputs and fair redistribution of benefits, and—if organized with municipal involvement—would be highly suitable for launch as a JICA project. Farmer-led governance offers strong on-site acceptance and supports sustainable long-term operations. However, at this stage, dairy cooperatives in the city are not yet fully developed, and establishing an organization, setting rules, and cultivating operating personnel would require considerable time and coordination costs. Farmers are not averse to forming cooperatives, but in terms of rapid pilot implementation, there are challenges with speed, and new operating burdens for sanitary and environmental management and collection/redistribution cannot be avoided.

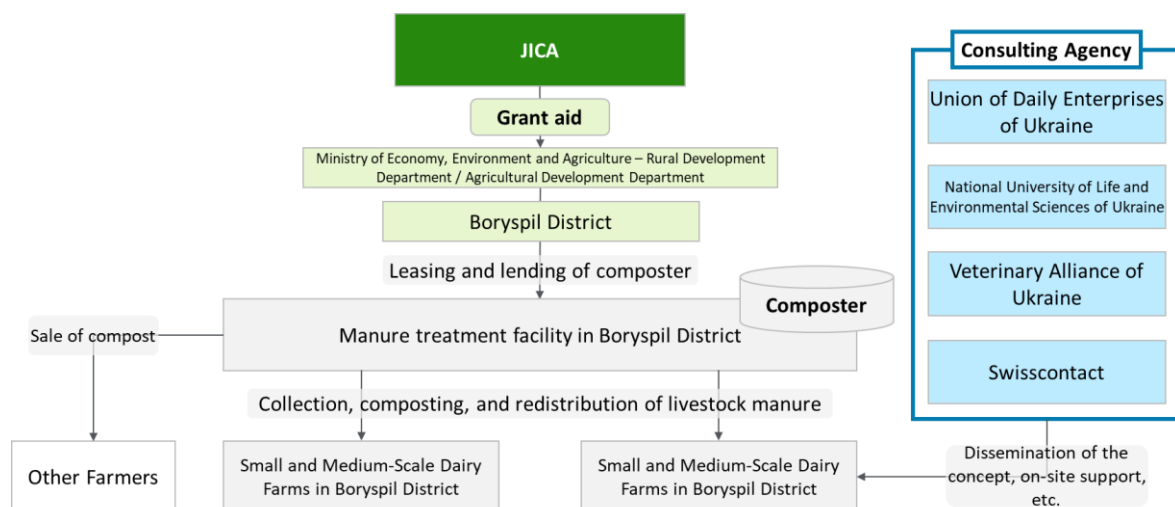
The agroholding-led option offers stability in both feedstock assurance and in-house utilization, backed by large herds and extensive farmland. Cross-species intake potential also favors smoothing of processing volumes and design freedom for compost. However, weak transactional relationships with small and medium-scale dairy farms make broad-based engagement difficult, limiting the project's core objective of wide distribution of benefits. If liquid fertilizer spreading or other resource-circulation projects are already underway, competition for feedstock may arise. As a JICA project, a mechanism to ensure publicity via the municipality or government is a prerequisite.

Overall, considering rapid pilot implementation, assurance of publicity, and alignment with the

objective of delivering benefits to small and medium-scale farms, the model centered on Boryspil District's manure treatment facility is assessed as the most promising. Leveraging existing infrastructure enables faster introduction and confers advantages in permitting and community acceptance. However, this presupposes a thorough review of current feedstock utilization and actual collection behavior, and the concretization of economic incentives and logistics for farmers to deliver to the facility. As a second option, a model in which a large dairy farm in the city is the operator and the municipality leases the equipment under a public–private partnership (PPP) arrangement is realistic. This would secure operating capability and feedstock stability while allowing the municipality to set rules for accepting inputs from small and medium-scale farms and for priority redistribution of compost. The dairy processor–operator model should be considered only when clear KPIs and economic returns tied to the company's sustainability strategy can be designed. The cooperative model is promising as a destination for medium- to long-term full-scale rollout, with organizational support to be provided based on pilot results. The agroholding model is advantageous in terms of scale but dilutes benefits to small and medium-scale farms, making it appropriate to position as a site for demonstrations and technical validation.

With the objective of establishing resource circulation for livestock manure in Boryspil District, two introduction models will be concretized using JICA's support schemes.

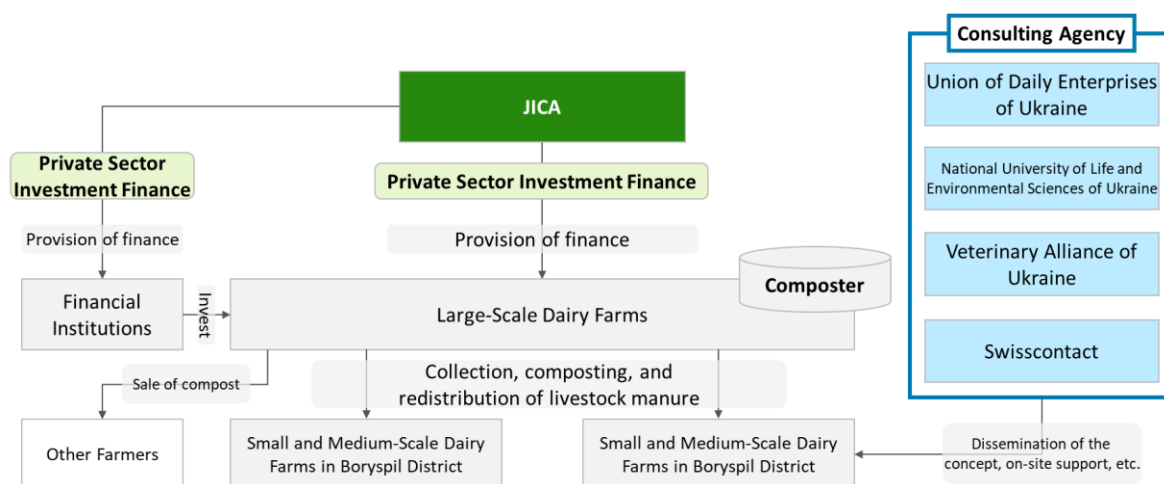
First, in the model centered on the city's manure treatment facility, JICA's grant aid scheme will be utilized to lease or lend composting equipment to the facility through Ukraine's Ministry of Economy, Environment and Agriculture—specifically, its Rural Development Department and Agricultural Development Department—and Boryspil District. The facility will centrally manage the collection, composting, and redistribution of manure within the city and return the resulting compost to small and medium-scale farms in the city. In addition, the Consulting Agency will provide accompaniment support, including concept dissemination, preparation of operating standards, on-site launch, and capacity building.



Source: JICA survey team

Figure5.2.8 Model Centered on a Livestock Manure Treatment Facility in Boryspil District

Second, under the model in which a large dairy farm in the city serves as the operator, the introduction of composting equipment will be pursued through direct financing to the farm via JICA's overseas investment and financing scheme, or through investments routed via financial institutions. The large dairy farm will act as the hub to carry out the collection, composting, and redistribution of manure, and will return the resulting compost to small and medium-scale farms in the city. In this case as well, the Consulting Agency will undertake dissemination of the concept and provide on-site technical and operational support.



Source: JICA survey team

Figure5.2.9 Model Centered on a Large-Scale Dairy Farm in Boryspil District

Whether adopting the model centered on Boryspil District's manure treatment facility or the model with a large dairy farm as the operator, the key issues to be finalized in the initial phase of introduction are common. First is the formation of the organizational framework: clarifying how many small and medium-scale dairy farms can actually be engaged; whether livestock farmers other than dairy (pigs, poultry, beef cattle) will also be included as feedstock suppliers; and the governance structure for participation requirements, cost sharing, benefit-sharing, and quality standards. Second is the implementation of collection and redistribution: it is indispensable to design the operational plan and cost structure on the premise of the geographic limit and frequency of collection, optimal routing and vehicle specifications, and the possibility of integrating with existing milk collection and feed delivery routes. As for the distribution of the resulting compost, an exit strategy must be defined that encompasses the balance between priority redistribution to participating dairy farms and external sales, pricing, inventory and quality management in line with seasonal fluctuations, and application plans by soil and crop. Third is the optimization of the composting process: establishing the suitability of the installation site; constraints on land and infrastructure; odor, leachate, and pest countermeasures; adjustment of the C/N ratio due to differences in manure characteristics and cross-species mixtures; risk management for foreign matter and pathogens; and mechanisms for batch-by-batch traceability and quality assurance. Fourth is the economic analysis: building the cash-flow model by incorporating the local price of

livestock-derived compost in Ukraine, the prevailing prices of chemical fertilizers procured externally by dairy farmers in each region, the actual costs of collection, transport, and redistribution, equipment CAPEX and depreciation, OPEX such as operating labor, energy, and maintenance parts, and the impact of seasonal fluctuations on utilization rates. Regarding monetization of carbon credits, it is important to quantify GHG reduction effects; assess methodological applicability; organize additionality, baselines, and leakage; design the monitoring, reporting, and verification (MRV) system; reflect registration and verification costs and credit price and foreign exchange risks; and present a payback outlook based on sensitivity analysis. Through these examinations, the break-even conditions, optimal collection radius, minimum number of participating farms, and acceptable ranges for prices and costs should be specified to enhance the transparency of investment decisions.

In addition, the model centered on Boryspil District's manure treatment facility has its own items to be confirmed. The paramount issue is actual farmer behavior: whether, at present, dairy farmers are in fact transporting manure to the facility, or whether the majority primarily apply manure on their own fields and do not ship externally. If the latter is the majority, designing incentives for delivery to the facility is indispensable, and clear benefits for farmers must be presented—such as intake pricing, transport subsidies, priority redistribution of compost, and free soil testing and application planning support. If resource circulation for liquid fertilizer spreading or other projects is already underway at the existing facility, competition for feedstock may arise; therefore, capacity limits, intake priorities, and alignment with existing operations must be organized. To leverage the advantages of co-location at the facility, it is essential to examine in advance the feasibility of utilizing existing infrastructure, any additional permitting requirements, prior agreements concerning community acceptance, and plans to expand environmental monitoring, and to establish a framework that balances publicness with operational agility.

By contrast, the model with a large dairy farm as the operator has strengths in operational agility and feedstock stability, but several issues unique to this model arise. First is the relationship with biogas: where biogas has already been introduced or is under consideration, integrated design is indispensable for the allocation policy for manure; combinations of secondary composting of digestate and solid–liquid separation; optimization of self-consumption and sale of heat and power; and avoidance of double-counting GHG reductions and selection of the appropriate methodology. Second are laws and permits: it is necessary to confirm in advance conformity with Ukraine's waste management standards, sanitary standards, environmental impact assessment requirements, construction and operating permits, and odor and noise regulations; plan for changes in applicable regulations and classifications when accepting third-party inputs; evaluate and mitigate neighbor impacts due to increased truck traffic; and carry out pre-consultation and consensus-building procedures with residents in a planned manner. In addition, because the operation is on private land, rules ensuring publicness and broad distribution of benefits, a coordination framework with the municipality, terms of equipment leasing agreements, and clear allocation of liabilities in the event of accidents must be established.

(2) Panasonic Environmental Systems & Engineering Co., Ltd. (Next-Generation Enclosed Barn System)

To ensure that the benefits of Panasonic Environmental Systems & Engineering Co., Ltd.'s (Next-Generation Enclosed Barn System) accrue to small and medium-scale farms, it is essential to introduce the system in a planned and phased manner for existing small and medium-scale farms with evident replacement needs, or for small and medium-scale farms newly entering dairy. Based on each target farm's business scale, herd size, local climate and infrastructure conditions, financial capacity, and the current state of milk quality and headroom for improvement, it is necessary to quantify the introduction benefits (stabilization of raw milk quality, yield and productivity gains, reduced disease risk and losses, lower energy and environmental footprint) and establish a framework that supports investment decision-making.

For deployment, an approach that partners with Boryspil District and the Consulting Agency—which has been providing continuous support to small and medium-scale farms in Boryspil District—is promising. Leveraging the Agency's network and on-site expertise, it is desirable to provide end-to-end support: selecting candidate sites and building consensus with farmers; managing regulatory and permitting processes; structuring financing schemes; designing and implementing pilots; establishing operational training and maintenance frameworks; and implementing post-introduction monitoring and improvement cycles. Tailoring to each farm's requirements, optimize barn layout; ventilation, temperature/humidity, and hygiene management; manure handling and environmental measures; energy efficiency; and sensing and data management. Balancing on-site fit with cost-effectiveness is the key to successful introduction.

From a market-environment perspective, with the EU's Autonomous Trade Measures expiring on June 5, 2025 and the revised EU–Ukraine trade agreement entering into force on October 29 of the same year, export opportunities for Ukrainian dairy products are expanding¹⁶⁸. Under the new agreement, the annual tariff-rate quotas for the EU market were expanded to up to 15,000 tonnes for milk and cream, up to 15,400 tonnes for skimmed milk powder, and up to 7,000 tonnes for butter and dairy spreads, while trade in fermented dairy products (such as yogurt and kefir) was fully liberalized (0% tariff with no quantitative limits). Ukraine has committed, as a condition for maintaining and expanding trade preferences, to align with relevant EU legislation by December 31, 2028. Against this backdrop, by the end of 2025, profitability rose by 50% year-on-year not only for dairy processors but also for dairy farms. Plans for new farms increased, and exports of higher value-added dairy products grew particularly strongly. In the first 11 months of 2025, the value of finished dairy products supplied to the EU exceeded USD 50 million, accounting for about 30% of Ukraine's total dairy exports to the EU. Cheese, packaged butter, ice cream, and private-label products were the main growth areas, and demand for high-quality

¹⁶⁸ Aggroberichten Buitenland. "Dairy Business 2025: Ukraine's Dairy Sector Looks Towards EU Integration and Added Value". 2025-12-16. <https://www.aggroberichtenbuitenland.nl/actueel/nieuws/2025/12/16/dairy-business-2025-ukraines-dairy-sector-looks-towards-eu-integration-and-added-value>, (Accessed 2026-04-02).

raw milk necessary for producing high value-added products is understood to be rising further.

Regarding introduction of the next-generation enclosed barn system, the key issues are common whether adopting a model starting from replacement of existing equipment or one starting from new entry. First is the selection of priority sites for introduction; target farms should be identified based on timing for replacement, scope for milk-quality improvement, financing capacity, infrastructure reliability, and compatibility with existing equipment. Second is the design of the introduction sequence and expansion plan: begin with ventilation equipment, the core of environmental control and hygiene management, and then expand step-by-step to include high-efficiency fans, ventilation control systems, fine-mist cooling, livestock heaters, and other components. Third is the economic analysis: determine CAPEX for individual components and for the full package, OPEX including energy, consumables, maintenance, and labor, and total cost of ownership, and build a cash-flow model that monetizes benefits from improved milk quality, reduced disease, and labor efficiency gains. The analysis should also incorporate the availability of subsidies, tax incentives, green finance, and leasing, as well as comparisons with competing products in terms of functionality, warranties, service networks, and pricing.

5.3 Workshops for Developing Skilled Personnel

5.3.1 Objective

From our investigations to date, the sector-wide shortage of skilled personnel is worsening due to the conscription of men and the outflow of younger cohorts. The impact is particularly acute at small and medium-scale farms, making this an urgent issue. Accordingly, we will conduct workshops that bring together educational institutions, experts, and supporting farms from both countries to examine the training domains in which Japan can provide support. Specifically, we will assess the current state of human resource development in Ukraine and establish the framework, identify Japanese universities and experts and narrow down support areas, and evaluate, through the workshops, the applicability of Japanese support content.

5.3.2 Assessment of the Current State of Human Resource Development in Ukraine and Framework Building

Dairy (dairy cattle husbandry) education in Ukraine is designed as a practice-oriented subfield of animal science, with highly specialized, dairy-specific competencies primarily acquired at the master's level. A defining feature is that the success of human resource development and retention is shaped by the interplay among education supply (universities and associations), employment demand (from large agroholdings to small and medium-scale farms), state support schemes, and updates to the legal framework.

(1) Education System and Major Institutions

Education programs comprise two stages—bachelor's and master's—with animal production engineer and veterinarian as the main tracks.

Animal production engineers generally follow a route of basic education at a vocational school, a bachelor's program, and then a master's program to obtain special qualifications; the total study period is five years. The advantage of this route is the dual option of entering employment upon completion of vocational school or deepening knowledge through higher education.

Veterinarians enroll from the outset in an integrated master's program at a university, with no expectation of mid-course exit. The study period is six years, and it is common for the program to include two years of internships in companies.

The principal higher education institutions are the National University of Life and Environmental Sciences of Ukraine (NUBiP), Bila Tserkva National Agrarian University, Vinnytsia National Agrarian University, Lviv National Environmental University, and Odesa State Agrarian University. These institutions generally adopt practice-oriented curricula aligned with employer needs. At NUBiP, employer councils are established in each faculty, with many seats held by representatives of large enterprises. Education quality is high; in NUBiP's Faculty of Animal Science, job offers are available from the fourth year, including recruitment by large agroholdings such as MHP.

The state actively supports human resource development by allocating "state order" quotas under which tuition is covered by public funds and by awarding additional admissions points to applicants from rural backgrounds. NUBiP, which is highly popular among applicants, receives a large allocation of state order quotas.

(2) Practical Training and Legal Framework

Universities run professional development programs for specialists (typically two weeks), complemented by associations such as the Union of Dairy Enterprises of Ukraine to strengthen practical skills. Theory is handled by universities, while hands-on components are delivered by association experts; at association offices and model farms, seminars for groups of 10–20 are held on topics such as hoof care (trimming/cleaning) and artificial insemination.

Under current law, however, training delivered solely by associations is not recognized as formal professional development. Under a new law on Veterinary Medicine and Animal Welfare¹⁶⁹ entering into force in March 2026, a framework is being considered under which the competent ministry can authorize associations to conduct training; associations are preparing to establish state-recognized training centers. By augmenting university-led, theory-centric professional development programs with practical training delivered by associations, higher-quality human resource development will be achievable.

Basic education meets farms' minimum needs, and post-hire skill adaptation relies primarily on on-the-job training at each farm. Because each company has its own processes, specialists must tune their

¹⁶⁹ World Trade Organization, Law of Ukraine No. 1206-IX "On Veterinary Medicine" of 04 February 2021. <https://lic-public.wto.org/en/legislations/3034>, (Accessed 2026-03-25).

competencies accordingly.

(3) Talent Supply–Demand and Hiring Environment

The single most important factor shaping students' job preferences is wage level, which gives large holdings able to offer higher pay a competitive advantage in recruitment. As a result, small and medium-scale farms are experiencing acute personnel shortages. In some rural areas where farms are located, infrastructure is weak—for example, there may not even be kindergartens—undermining the willingness to work there.

As talent-attraction measures, social support packages such as housing provision are effective, but they are primarily feasible for large farms; small and medium-scale farms face significant fiscal constraints. The mainstay of talent supply is people under 25—i.e., students immediately after graduation. From age 25, men fall within the conscription age, making retention more difficult. Factors that keep new hires from leaving include emotional attachment to the farm and the possibility of securing deferments or exemptions from mobilization (conscription). Owing to these special circumstances, it is challenging to rely on other countries' experience when designing human resource development measures. For attracting veterinarians and related specialists, measures include providing free housing, preferential terms for home purchases, and allowances for rural service, which are particularly effective in western Ukraine, where shortages of specialists are severe. Among very large enterprises with herds of 5,000–10,000 head, there are cases of purchasing real estate at the company's expense to secure personnel. For small and medium-scale farms, similar measures may be possible if municipalities participate and provide support, creating room to attract specialists.

New entry into dairy is exceedingly rare, primarily due to high upfront investment and long payback periods. For example, even if a yearling heifer is purchased, it will be about two years before she can be milked; during that time, only investment continues, leaving the operation vulnerable to exogenous shocks. By contrast, the payback period for broilers is short—around 40 days. Moreover, upon exit, average liquidation proceeds for farm assets are only about 60% of market value. Consequently, in dairy, intergenerational succession, expansion (consolidation) of existing farms, and integration of multiple farms have become the norm.

5.3.3 Identification of Japanese Universities and Experts and Narrowing of Support Areas

(1) Rakuno Gakuen University – Professor Kohei Makita: Hygiene Management

Although hygiene management standards are presented by the State Service of Ukraine on Food Safety and Consumer Protection, it is highly likely that small and medium-scale dairy farms are unable to meet all requirements due to shortages of labor, funds, and equipment. Swisscontact has also pointed out that small farms lack full-time veterinarians and hygiene specialists and that cleaning of barns, feeding, and milking rely on manual labor, necessitating proper understanding and institutionalization of procedures. In light of this, it is appropriate to prioritize hygiene management as a support domain.

For small and medium-scale farms, the assumed milking procedure is as follows: before milking,

clean and wipe the udder and perform a pre-dip on the teats; after milking, carry out a post-dip and wiping. Milking should be conducted in buildings that are thoroughly cleaned and compliant with hygiene standards; cows should be washed before milking, and operators should observe hygiene measures and wear dedicated clothing. In terms of equipment, Ukrainian- and Polish-made milking systems are mainstream on farms with 100 head or fewer, while enterprises with more than 100 head generally adopt German-made equipment. For manure management, a common operation is for livestock workers to collect manure in the barn using a manure conveyor and transport and store it at the compost yard twice daily with a dedicated trailer. At small and medium-scale farms, manure has high on-farm fertilizer demand and contributes to nutrient supplementation and yield increases. Some large enterprises are pursuing biogas, but high introduction and operating costs have limited uptake. Regarding raw milk storage, inadequate cooling and storage equipment is a bottleneck, and quality must be maintained through transport and distribution arrangements. Maintaining quality is indispensable for stable supply to dairy processors, and strengthening hygiene management is directly linked to economic sustainability.

On the Japanese side, participation by Professor Kohei Makita¹⁷⁰ of Rakuno Gakuen University would be effective. A specialist in veterinary epidemiology and One Health, he has participated in the JICA Grassroots Technical Cooperation “Mbarara Safe Milk Production Support Project.” In that project, a risk-based hygiene management checklist was introduced and piloted across the milk supply chain, covering farms, collection points, transport, and small-scale retail. Specifically, items such as pre- and post-milking hygiene, equipment cleaning, rapid cooling and temperature recording, simple tests such as alcohol tests and drug residue screening, and records and traceability were itemized; in collaboration with stakeholders, standards were localized, and a regime of scoring and re-instruction established to drive continuous improvement. As a result, reductions in bacterial counts and temperature deviations were reported. These insights are fully applicable to Ukraine when aligned with its institutional, equipment, and distribution realities.

(2) Tokyo University of Agriculture – Professor Tatsuo Noguchi: Prevention and Reduction of Peripartum Diseases

Peripartum diseases are evident among small and medium-scale dairy farms in Ukraine. In addition to cases of endometritis and metritis in cows post-calving, occasional cases of postparturient paresis (a severe, acute neurological disease occurring 1–3 days after calving due to a precipitous drop in blood calcium) have been reported. Hoof disorders and lameness—tendencies often seen in Holsteins—have also been reported, with a herd-level incidence of about 5–10%. Hoof disorders and lameness are detected by visual inspection at milking; when signs such as lameness or limb lifting are observed, the veterinarian is notified and subsequently performs hoof cleaning and trimming using specialized equipment. Furthermore, ration design is not fully optimized; in particular, cows in the transition period

¹⁷⁰ Rakuno Gakuen University Professor Kohei Makita. <https://www.rakuno.ac.jp/teacher/9430.html>, (Accessed 2026-03-25).

tend to be deficient in vitamins, lowering immunity after calving and, in some cases, leading to death. The background factor is the high cost of vitamins, which prevents adequate feeding for transition cows. Overall, inadequate knowledge, insufficient hygiene management, and poor feed balance are the primary drivers of peripartum diseases at present.

As countermeasures, administering vitamins and minerals to cows immediately after calving to prevent metabolic diseases stemming from energy and nutrient deficiencies, and improving hygiene management during calving to suppress endometritis and metritis, are effective. In particular, bovine comfort and proper feeding are vital; feed management should be thorough at all stages—from cultivation of feed crops and preparation of feed to balanced formulation and delivery. In addition, incorporating grazing and free-ranging to increase exercise and improve footing conditions should be pursued to reduce the incidence of hoof disorders and lameness. Hoof disorders and lameness are common issues across Ukraine, and farms address them in various ways; the current situation is not yet at a critical level. Hoof baths with copper sulfate solution are typically used, and formalin is sometimes applied. To reduce incidence, it is necessary to continue regular hoof treatments using these means and to implement planned hoof trimming, while standardizing management procedures and enforcing monitoring.

On the Japanese side, participation by Professor Tatsuo Noguchi¹⁷¹ of Tokyo University of Agriculture would be effective. A veterinarian, Professor Noguchi specializes in improving fertility, livestock hygiene, productivity enhancement, and bovine embryo transfer, with extensive academic knowledge and practical experience beyond the peripartum field. In addition, based on practical initiatives at the university's Fuji Farm, he is expected to provide concrete, practice-oriented insights that contribute to on-site implementation and effectiveness verification.

(3) Obihiro University of Agriculture and Veterinary Medicine – Professor Masaaki Hanada:
Improving Nutritional Balance

A defining feature of dairy cattle husbandry in Ukraine is the self-sufficiency framework for basic forages. Many companies and farms self-produce corn silage, haylage of cereals and legumes, and feed straw, storing them in trench silos. Concentrates are designed mainly around cereal grains and oil meals, with protein sources consisting primarily of various meals. Most enterprises harvest corn grain themselves and procure protein components externally—such as soybean meal, sunflower meal, and rapeseed meal. Depending on region and season, beet pulp and brewery by-products are also used. Additives and premixes are basically salt, calcium carbonate, and sodium bicarbonate, with magnesium oxide and other components used as needed. While the supply of supplements exceeds demand in the marketplace, vitamins are high-cost and present a significant barrier to adoption for small and medium-scale farms. Furthermore, differences in silage production and storage, as well as formulation and feeding practices, cause significant variability in feed quality and nutritional balance across farms.

¹⁷¹ Tokyo University of Agriculture Professor Tatsuo Noguchi. http://dbs.nodai.ac.jp/html/357_ja.html, (Accessed 2026-03-25).

The main current challenges for small and medium-scale farms in Ukraine are stagnating milk yields and high disease rates stemming from poor nutritional balance. In small-scale dairy operations, average milk yield often remains around 15–25 L, and imbalances in energy, effective fiber, digestible starch, and protein, as well as shortages of minerals and vitamins, negatively affect milk production, fertility, and immune function. Particularly in the transition period, the high cost of vitamins makes adequate feeding difficult, increasing the risk of post-calving immune suppression and disease or death.

On the Japanese side, participation by Professor Masaaki Hanada¹⁷² of Obihiro University of Agriculture and Veterinary Medicine would be effective. A specialist in feed science and animal nutrition, he has lectured in JICA training programs on “Feeding and management technologies for milk production to improve nutrition” and “Cattle feeding and management for milk and meat production based on local resources.” He is expected to provide Ukrainian dairy stakeholders with insights on how to maximize nutritional balance using limited feed resources.

(4) Obihiro University of Agriculture and Veterinary Medicine – Professor Hiromichi Otsuka:
Improving Dairy Cow Health and Productivity

In Ukraine, each farm registers individual identification information for livestock and records disease histories and vaccination status for each cow. Management plans formulated by the State Service of Ukraine on Food Safety and Consumer Protection exist, and farmers comply with them. Regular inspections are conducted, and the nationwide incidence of mastitis is about 2%. Detection is performed mainly during milking, and antibiotics are used as needed; milk collected during treatment is discarded. As preventive measures, in addition to mastitis vaccination, it is important to maintain good cow health through day-to-day husbandry management.

Veterinary examination of livestock is mandated for all entities. Veterinarians make regular farm visits to conduct examinations and collect and test samples. On the other hand, visual health management is mainstream at small and medium-scale farms, and at very small farms visits may not occur because veterinarians cannot secure sufficient workload and travel time losses are significant.

At small and medium-scale farms, mastitis is a major issue, and antibiotics are used for treatment. At one farm, before milking, the milking operator observes and palpates the udder; when disease is suspected, the veterinarian is notified and provides treatment. The method of treatment is to administer intramammary infusion via the teat canal. At another farm, responses center on visual confirmation during milking; incidence is affected by seasonal factors and increases in wet weather, making the diligence of milking operators particularly important. Some farms see incidence rates in the range of 5–7%. For early identification of subclinical mastitis, there are cases where testing based on somatic cell counts is conducted twice a month and detected cases are treated with antibiotics.

¹⁷² researchmap Professor Masaaki Hanada. <https://researchmap.jp/c57105>, (Accessed 2026-03-25).

On the Japanese side, participation by Professor Hiromichi Otsuka¹⁷³ of Obihiro University of Agriculture and Veterinary Medicine would be effective. He specializes in clinical immunology, the relationship between bovine nutrition and immune function, internal medicine of production animals, and bovine hygiene, and has a research track record in elucidating immune function in peripartum dairy cows and managing infectious disease risks, as well as in clarifying the pathophysiology of various cases. These insights can help solve the challenges faced by small and medium-scale farms in Ukraine.

5.3.4 Applicability Assessment of Japanese Support Measures through Workshops

(1) Rakuno Gakuen University – Professor Kohei Makita: Hygiene Management

Professor Kohei Makita of Rakuno Gakuen University presented a case of comprehensive support delivered through JICA technical cooperation to small-scale dairy farmers in Uganda, centered on productivity and milk-quality improvement, hygiene and herd health management, and human resource development. The objective was to improve milk safety and productivity, with a focus on milking hygiene, nutrition and reproductive management, and control of tick-borne diseases, combining accompaniment by resident Japanese experts with continuous capacity building and local engagement. Operations were conducted in collaboration with universities, government, and cooperatives, rolling out activities on mastitis/milking hygiene, reproduction, and tick control from core farms to surrounding farms. The baseline survey identified a high CMT-positive rate, inadequate milking hygiene, insufficient reproductive records, high prevalence of East Coast fever (ECF) and acaricide resistance, and contamination at water sources and collection points. Interventions included single-use cloth wiping (“one cow, one cloth”) for teats, ration design aligned with milk yield, strengthened management of ketosis and heat detection, preparation of hay and silage, proper use of acaricides, and facility improvements. As a result, field adoption progressed, with reported increases in milk yield, reductions in subclinical mastitis, and improvements in bulk milk quality—confirming the effectiveness of evidence-based guidance.

While this successful case from Uganda contains elements applicable to Ukraine’s small-scale dairy farms, adjustments are indispensable to reflect social and market differences. The human resource development workshop reconfirmed that small-scale farms in Ukraine have low profitability and face difficulty expanding operations. Improving profitability presupposes economies of scale—at least 200 head, ideally 400–500. When sales are limited to local markets, unit prices remain low; thus, producing high-quality raw milk is essential for revenue growth, and inadequate enforcement of hygiene management is one of the principal barriers.

Three factors were identified behind insufficient hygiene management. First, there is a knowledge gap and human-resource constraint. The know-how gap between large and small farms is significant. Although hiring of female workers is increasing to supplement labor shortages, broader knowledge of

¹⁷³ Obihiro University of Agriculture and Veterinary Medicine Professor Hiromichi Otsuka. <https://www.obihiro.ac.jp/faculty-r/hiromichi-otsuka/>, (Accessed 2026-03-25).

the dairy business—including hygiene management—is lacking. What is missing is practical knowledge of day-to-day procedures and standards: keeping barns dry and clean; bedding replacement frequency; management of ventilation and stocking density; pre- and post-milking teat cleaning/disinfection and milking-machine sanitation; cooling and water hygiene; and recognizing early signs of mastitis. Protocols for isolating newly introduced animals and separating sick animals, controlling the movement of visitors and equipment, measures against ticks, flies, and rodents, and timing of pasture mowing are also insufficiently systematized. In addition, understanding of appropriate selection and dosing of anthelmintics and antibiotics, withdrawal periods, resistance-avoidance practices, habits of recordkeeping and inspection, worker hand hygiene and protective measures, knowledge of local regulations and testing standards, and when to consult veterinarians remains unclear. There is also a shortage of “mechanisms that stick” for on-farm continuity—such as cleaning and humidity control suited to long winter housing; hygiene of well and wash water; manure handling and mud control underfoot; heating of raw milk and checking for drug residues; simple SOPs and training; and seasonal checklists. Another challenge is the weak capacity to understand locally prevalent diseases and tick seasonality and to gather necessary information.

Second, support-environment constraints are significant. At present, there is no public human resource development program for small and medium-scale dairy farms in Ukraine. With roughly 80% of the national budget allocated to defense, there is no clear outlook for allocating funds to farmer support. Even if the aggression ends, there is no guarantee of stable funding flows to small and medium-scale farms. Swisscontact and the German government are providing guidance to fill this gap, and the workshop made clear that a comprehensive support program—like the one Japan deployed in Uganda—is strongly needed in Ukraine. However, compared with Uganda, Ukraine faces greater market instability and resource constraints, making support design tailored to local conditions indispensable.

Third, regulatory and pharmaceutical-access issues exist. During long winter housing, populations of small ectoparasitic mites increase, leading to persistent itching and hair loss. In spring and autumn grazing seasons, hematophagous ticks increase, causing fever and reduced stamina that lead to lower milk yield. With the spread of scrubland, ticks can spread more easily, and consideration must be given to the risk of human infection via raw milk; this underscores the importance of thorough heat treatment, planned mowing of pastures, and herd-wide prevention. Attention is also needed to wintertime humidity and overcrowding in barns and the risk that newly introduced cows in spring bring in pathogens—maintaining cleanliness is fundamental. Drug treatment is used for tick control, but an opaque new-drug registration system, requiring three to four years for approval, impedes access to effective pharmaceuticals. The Ukrainian Association of Veterinarians is working to address this issue, but, at present, it remains a bottleneck in hygiene and disease control.

Going forward, rather than merely transferring know-how, an approach that integrates Japanese advanced technologies into on-farm operations is promising. For example, alongside providing hygiene management know-how for manure handling, introducing Kohshin Engineering’s composting

equipment and institutionalizing it as a standard operating procedure would enable sustained reduction of hygiene risks from manure. In addition, it is desirable to redesign—in line with Ukrainian conditions—the frameworks that proved effective in Uganda: standardization of milking hygiene; strengthening rapid cooling and milk collection with quality-linked price incentives; data-driven extension systems; and continuous training for veterinarians and extension officers.

(2) Tokyo University of Agriculture – Professor Tatsuo Noguchi: Prevention and Reduction of Peripartum Diseases

Professor Tatsuo Noguchi emphasized that ration design for the transition period (around calving)—which directly affects the prevention and reduction of peripartum diseases—must be optimized to reflect individual animal differences and each farm’s preconditions; there is no single solution that applies universally. He proposed practical indicators for judging the appropriateness of ration design: body condition score (BCS), timing of first estrus after calving, days to first artificial insemination, and calving interval (days open). By continuously tracking these indicators, the validity of ration design and areas for improvement can be visualized.

He stressed that factors affecting reproduction-related issues—nutrition management, reproductive management, hoof and limb management, peripartum management, infectious disease control, selection and culling of cows, securing replacements, and animal welfare (comfort of the rearing environment)—are interrelated. The priority order of nutrient partitioning is maintenance, fetal growth, the cow’s own growth, lactation, body fat reserves, and reproduction; reproduction is last, so reproductive performance reflects the overall quality of ration design and surrounding management. Ideally, post-calving estrous resumption and uterine recovery are quick; ovarian cycles and estrous signs are clear; and corpus luteum formation and conception are stable. When warning signs appear, it is essential to quickly determine whether the issue is individual or herd-wide, whether it stems from ration design or other factors, whether a trend exists, whether it falls within tolerance, and whether to observe or act immediately.

To raise milk yield per head, year-round fine-tuning of rations is effective. Specifically, he proposed shifting from grass-dominant menus at the start of the year to alfalfa-dominant menus, temporarily curbing alfalfa during summer in response to heat stress and producer judgment, and then returning to baseline levels. Sustained seasonal and condition-based nutritional adjustments can improve both milk and reproductive efficiency, extend productive lifespan, increase the number of calves sold, raise cull-cow revenue, stabilize replacement numbers, and reduce the costs and labor required for disease treatment. In summary: optimizing the environment to extract the full power of feed is a prerequisite; reproductive dynamics are the most reliable information source; ration designs that yield good reproductive performance are the “right answers,” but those answers change with circumstances; maintaining a ration that poses no reproductive problems maximizes milk yield; and improving reproductive efficiency is the most effective way to compress the feed-to-milk cost ratio.

Based on the lecture, the workshop discussed reproduction-related issues and current support for small and medium-scale farms in Ukraine. Despite frequent reproductive problems, self-resolution is

difficult, and access to experts is a bottleneck. Private consultants are expensive and thus unaffordable for small and medium-scale farms, whereas large farms have in-house specialists. As public support, municipalities provide approximately JPY 20,000–30,000 per household per year to facilitate access to specialists, but, Swisscontact aside, there are no public entities that directly provide specialists. Swisscontact has built a track record in Chernihiv Oblast and is now expanding to Kyiv Oblast.

This workshop focused on four areas in particular: nutrition management, infectious disease control, selection and culling of cows, and animal welfare. In nutrition management, while Cargill-branded vitamins have been introduced, their high prices make continued purchasing difficult for small and medium-scale farms, raising concerns about deteriorating feed balance and negative impacts on reproduction and productivity. Participants requested the Japanese side to share whether Japanese-made vitamins with overseas track records exist and to provide views and information on their cost, availability, and suitability. Many raw vitamins are manufactured by major overseas firms, and in Japan it is common for compound-feed manufacturers and veterinary-oriented companies to supply premixes and formulations. Major domestic players include Japan Zenyaku Kogyo Co., Ltd., Bio Science Co., Ltd., and Nihon Garlic Co., Ltd. On the implementation side, it is important to design minerals and vitamins specialized for the transition period, optimize formulations based on locally available ingredients, and formalize operational rules for seasonal feeding standards and BCS management.

For infectious disease control, gastrointestinal diseases, infectious diseases, and metabolic disorders are evident at small and medium-scale farms; the main causes are insufficient countermeasure know-how and lack of access to specialists. In response, many participants supported constructing a support framework that invites Japanese specialists—similar to Swisscontact—combining circuit-rider guidance with remote consultation, smoothing farmer co-payments through linkage with municipal subsidies, and developing local trainers (TOT) to enable self-sustaining capacity. As outcome indicators, it is appropriate to set reproduction and health KPIs such as days to first estrus after calving, days open, mastitis incidence, and calf diarrhea and pneumonia incidence.

Regarding selection and culling, small farms strongly desire to preserve Ukraine's traditional breed, the Ukrainian Grey; however, the breed's low milk yield and feed efficiency reduce economic viability. To reconcile preservation with economics, effective measures include a two-tier structure—line conservation with a nucleus for the preservation herd while lifting productivity in commercial herds through crossbreeding—creating price premiums by differentiating and adding value to products derived from traditional breeds, and clarifying data-based culling criteria. Participants asked the Japanese side to share knowledge and case examples for such designs.

On animal welfare, rapid alignment with EU standards is urgent; improvements to the rearing environment and decarbonization are indispensable. At the same time, realistic constraints were noted—namely, increased financial burdens associated with equipment and operational improvements. Recently, methane-reduction technologies from the United States have entered Ukraine; participants requested opinions from Japanese professors on their effectiveness, cost, regulatory fit, and implementability.

Evaluation requires a comprehensive judgment considering cost per head per day, consistency of methane-reduction rates, presence or absence of side effects on milk yield, milk quality, and reproduction, feasibility of establishing MRV (measurement, reporting, and verification) systems, alignment with EU regulations, and supply-chain stability.

(3) Obihiro University of Agriculture and Veterinary Medicine – Professor Masaaki Hanada:
Improving Nutritional Balance

This lecture focused on optimal use of feed resources and formulation design in small and medium-scale dairy, presenting an approach to intensify metabolizable energy (ME) and crude protein (CP) within the limits of constrained dry matter intake as nutritional requirements rise with increasing milk yield. Because neutral detergent fiber (NDF) can limit dry matter intake (DMI) if too high or too low, it is essential to design by back-calculating from maximum intake potential per unit body weight (as a guide, DMI at 3–4% of body weight and NDF at about 1.2% of body weight) and the share of NDF in the ration. In high-lactation phases, forages alone cannot meet required ME and CP, making appropriate combinations of concentrates and high-nutrition self-produced and by-product feeds indispensable. Understand the ME, CP, and NDF characteristics of feedstuffs and formulate with timothy hay, alfalfa, corn silage, rice bran, etc., according to regional suitability and objectives. Water requirements vary with DMI, dry matter ratio, Na, K, CP, and temperature; shortages can occur even in winter, so ample water must be ensured at all times.

The lecture also highlighted avoiding excessive reliance on grains and proposed a strategy combining well-managed grazing, timely harvest, ensiling, and use of by-products to provide high-nutrition, low-cost alternatives. At the farm level, there is a need to visualize issues, enhance the value of self-produced forages, and reset optimal milk-yield targets—shifting to formulation designs that incorporate the decline in digestibility and the rising requirements that accompany higher milk yield, which otherwise degrade feed efficiency.

Some workshop participants referenced U.S. feeding practices, adopting designs with DMI at 23–27 kg and CP at 16.5–18%. Ukraine’s average CP is 16.8–17.5%, and milk yield hovers around 40 kg/day; the professor noted that CP is relatively high for this yield level. Excess protein feeding increases feed costs and nitrogen excretion; therefore, CP should be optimized in light of milk yield, body condition, and rumination status, with the energy balance adjusted accordingly.

Given Ukraine’s circumstances, major ingredients for concentrates are chosen considering price and availability: corn as an energy source and rapeseed meal and soybean by-products as protein sources. Soybean meals are largely exported, making it expensive and limiting its use in formulations. Although sunflower meals are available at low cost, a traditional view persists that rapeseed meal and soybean by-products are more promising for high milk yield; farms without such reservations do use sunflower meal. For brewers’ grains, increased drying costs due to rising gas prices have reduced utilization in recent years.

The professor recommended prioritizing the use of well-preserved silage in winter feeding and promoting a shift away from straw dependence. While many Ukrainian farms rely heavily on straw without making silage, precipitation tends to be lower than in Japan, and weather conditions that facilitate proper cutting and pre-drying are favorable for silage production. With irrigation, yields of 40 t/ha are achievable, but many farms lack irrigation and thus struggle to attain high yields. Precisely because feeding is basically forage-centric, stabilizing quality through timely harvest and proper silage preparation and storage management, and raising energy density, is the practical solution.

He also called for correcting perceptions regarding acidosis. Ukraine produces many wheat by-products; while bran is used as bedding, it is not commonly fed due to concerns about acidosis, with corn used instead. However, corn has a higher starch content than wheat bran and thus a higher acidosis risk. Securing energy for high-yield cows is paramount, but it is essential to reconcile high energy density with rumen health by ensuring effective fiber, suppressing TMR sorting, observing chewing time, and optimizing water and minerals.

The lecture also addressed the relationship between universities and regional dairy farms. Whereas universities related to animal husbandry in Japan frequently collaborate with local farmers to support productivity improvement, such opportunities are limited in Ukraine. From the standpoint of human resource development, the Ukrainian side expressed a desire to strengthen collaboration between academic institutions and dairy farms and to implement joint programs and on-site demonstrations with participation from Japanese universities. In light of this, constructing a collaboration model centered on standardizing ration design, improving silage preparation, optimizing protein feeding, and training in acidosis management—and introducing measures step-by-step starting with those offering the best cost-effectiveness and ease of implementation—would benefit both short-term improvements and medium-term competitiveness.

(4) Obihiro University of Agriculture and Veterinary Medicine – Professor Hiromichi Otsuka:
Improving Dairy Cow Health and Productivity

This lecture focused on dairy cow healthcare and productivity improvement, using Japanese dairy as a case to illustrate current conditions, issues, and concrete countermeasures. As a productivity strategy across nutrition/feeding, facilities/environment, and health/hygiene, it emphasized securing DMI, stabilizing the rumen environment, supplying physically effective fiber (peNDF), adjusting TMR moisture and chop length, enriching bedding and implementing heat abatement, ensuring free access to water, avoiding overcrowding, maintaining immunity, and thorough management of mastitis, lameness, and reproduction—pursuing loss reduction and potential realization in tandem. During the peripartum period, lowered DMI and negative energy and protein balance with elevated NEFA can precipitate ketosis, fatty liver, hypocalcemia, rumen acidosis, mastitis, retained placenta and metritis, displaced abomasum, and other disorders—making effective fiber, management of dietary cation–anion difference (DCAD), and micronutrient supplementation critical. Rumination time is an indicator of metabolic status; shortening is associated with elevated NEFA and BHBA and impaired immune function. In

primiparous cows, body weight correlates with milk yield. Cow comfort comprises ease of lying down and standing up, restfulness, ventilation, free access to feed and water, and appropriate human–animal relationships. On-site, it is vital to cycle through identifying farm-specific issues, considering countermeasures, setting short- and long-term targets, and verifying outcomes.

The workshop reconfirmed ongoing structural changes in Ukraine’s dairy industry. The number of medium- to large-scale farms producing over 100 tonnes of raw milk per day is increasing; Astarta-Kyiv, a major large-scale farm in Kyiv Oblast, produces approximately 350 tonnes of raw milk per day. The greatest challenge is the paucity of state support; Ukrainian companies face tough conditions competing with EU countries that receive national support. Domestically, expansion to realize economies of scale is advancing; farms with more than 1,000 head can compete on a standalone basis even without subsidies. There were reports of approximately 30% reductions in production costs for raw milk and dairy products in the final quarter of last year. While the market sees strengthening competitiveness among large players and rising exit pressure on small farms—driving polarization—exports continue; for example, about 800 tonnes of milk powder were exported to Japan in Q1 2026, accounting for roughly 50% of Ukraine’s milk powder exports. To sustain small farms, the Ukrainian Dairy Association is promoting the introduction of new technologies and know-how; under a shared recognition that diverse cooperation and collaboration are indispensable, the introduction of Japanese knowledge and technology has significant value.

As a concrete health-management issue, poor feed balance was highlighted. While improvements are possible through dissemination of knowledge, persistent high vitamin prices make purchasing itself difficult for some farms. There were requests for information on vitamin products implemented in Japan and with overseas track records; the Japanese side is expected to present options—considering cost-effectiveness and procurement feasibility—and share a prioritization framework.

Veterinarians also noted that, given the financial constraints of small farms, it is necessary to assign clear priorities to introduced technologies and know-how. In response to the question of which technologies and knowledge from Japan are most promising for small and medium-scale farms, Professor Otsuka indicated that, rather than offering a universal “single best solution,” a framework that prioritizes measures with high expected impact and feasibility based on farm diagnostics is effective. In light of the above, we conclude that productivity improvement centered on prevention of peripartum diseases will be more effective when expert knowledge provision to individual farms is combined with the introduction of technologies suited to on-site conditions.

Through the workshops for developing skilled personnel, we verified areas where support from Japan to the Consulting Agency is feasible and strengthened capacity by providing missing know-how—thereby advancing support for the regional dairy cluster. Furthermore, given that the new law on Veterinary Medicine and Animal Welfare entering into force in March 2026 will recognize practical training conducted by associations as formal professional development and further elevate the role of

associations such as the Union of Dairy Enterprises of Ukraine in human resource development, a support modality centered on a training-of-trainers (TOT) approach that systematically transfers Japanese know-how to associations is considered promising.

CHAPTER6 COMPREHENSIVE PROPOSALS TRANSCENDING CROP TYPES

Chapters 2 to 4 analyzed the challenges and examined proposals for each specific crop. As some of these proposals are applicable across different crops, this chapter will consider these cross-cutting initiatives.

6.1 Project on Promotion of Small-Scale Horticultural Agriculture: Enhancing Inclusiveness of Women Farmers (Phase 2) (Technical Cooperation Project and Grant Aid)

The "Project on Promotion of Small-Scale Horticultural Agriculture: Enhancing Inclusiveness of Women Farmers" (hereinafter referred to as the "Women Farmers Support Project")¹⁷⁴, implemented by JICA, is positioned as a pilot. Within this project, the Ukrainian implementing agencies and JICA consultants are standardizing the programs and educational materials based on its achievements. To facilitate the expansion of training to other vocational training schools in Ukraine, they are currently developing a standardized textbook.

With the current project scheduled to conclude in February 2026, it is essential to build upon its achievements to benefit a broader range of regions and target groups. This proposal, therefore, envisions a "Phase 2" of the project as a concrete measure to achieve this, involving the development of a standardized curriculum and manuals, and an overall enhancement of the program.

Interviews with small to medium-sized enterprises conducted during this study revealed that farmers have limited access to finance for introducing expensive equipment and machinery and are therefore attempting to reduce production costs and increase yields through their own innovative methods. Consequently, creating opportunities to use necessary equipment and materials (including through leasing and trial use), improving access to finance, or transferring technologies that contribute to cost reduction and yield enhancement have become critical issues.

In the production of potatoes and cabbages, technologies for soil management, irrigation management, and pest and disease control are not sufficiently widespread. A shortage of storage facilities and a lack of funds for equipment introduction also pose challenges. As a result, small-scale enterprises and women farmers strive to improve quality and yields and reduce production costs through their own ingenuity, but face limitations due to difficulties in securing financing. Although simple irrigation and traditional pest control methods are practiced at the field level, the instability of the energy supply and the lack of adequate storage and processing facilities remain significant barriers.

For tomatoes grown under protected cultivation, farmers are attempting to reduce costs by utilizing self-made greenhouses and irrigation systems; however, achieving energy self-sufficiency and introducing mini-tractors, refrigeration and processing equipment, and secondary facilities such as

¹⁷⁴ Japan International Cooperation Agency (JICA). "Signing of Minutes of Discussions on Technical Cooperation for the Development Planning in Ukraine: Supporting Small-Scale Horticulture Farmers, including Women, through Training." 2024-07-02. https://www.jica.go.jp/english/news/press/2024/20240702_32.html. (Accessed 2026-01-07).

heating remains a challenge. There is a strong demand for establishing power self-sufficiency systems and introducing small-scale machinery (as detailed in section 2.4.1).

Furthermore, while the natural environment is suitable for berry cultivation, challenges in production technology persist, such as inadequate soil and water management and responses to frost damage and heat stress. Particularly among small-scale farmers, there is an insufficient accumulation of technical knowledge regarding protected cultivation. In addition, support for developing sales channels for high-value-added products and in marketing is also required.

To address the challenges identified in this study, it is considered possible to leverage the achievements of the existing Women Farmers Support Project. The proposed initiative (Phase 2) plans to expand the number of target institutions, further enhance the instructor training programs, standardize training materials and manuals, and provide training support to producers. This aims to promote the dissemination of technologies for appropriate soil and water management and for responding to climate risks such as frost damage and heat stress. It will also strengthen knowledge on protected cultivation, while in terms of marketing, it will promote the development of sales channels for high-value-added products and expand access to processing markets.

However, technical guidance alone has its limits when it comes to mastering the skills needed to effectively utilize modern equipment and materials. While the existing Women Farmers Support Project provided training tailored to the equipment available at each vocational school (with tractors introduced in some cases), a need for a wider variety of equipment and materials was also identified.

Considering this situation, a new support scheme utilizing Grant Aid is proposed to facilitate more effective technology transfer. Specifically, this scheme involves procuring high-demand agricultural equipment and materials, such as tractors, fertilizers, and polymers, through Grant Aid and deploying them to vocational training schools for training purposes. It will also establish a practical program allowing farmers "trial use" of this equipment. This approach aims to promote the dissemination of equipment and materials and enhance overall technical capacity by enabling farmers to learn correct usage techniques while experiencing their effects firsthand in their own fields.

Through this comprehensive approach, the initiative aims to enhance the technical, managerial, and market development capacities of small-scale enterprises in Ukraine, particularly women farmers, thereby strengthening inclusivity and sustainability in the agricultural sector.

Furthermore, this project is envisioned to extend beyond these direct benefits and has significant potential for future scalability. By building on the foundation of the achievements from the Women Farmers Support Project (e.g., standardized programs and materials), it is expected that when the training expands to other vocational schools nationwide in the future, the content can be upgraded and equipment leveraging Japanese technology can be introduced. This will create a ripple effect, extending the project's impact on a national scale.

Project Objective

The primary propose is to enhance the technical, managerial, and market access capabilities of a greater number of small-scale farmers and women farmers, thereby strengthening the inclusivity and sustainability of Ukrainian agriculture. This will be achieved with a primary focus on resolving the identified challenges in the food value chains (FVCs) for vegetables and berries by standardizing and upgrading training programs and educational materials based on the outcomes of the pilot project, and by expanding the scope to additional target institutions and regions.

Beneficiaries

The beneficiaries will be small-scale farmers participating in the Project for the Promotion of Small-Scale Horticulture including Enhancement of Inclusivity of Women Farmers, as well as participants from other vocational training schools who will enroll in the training programs developed based on this initiative.

Implementing Agencies

Ministry of Economy, Environment and Agriculture (Department of Rural Development and the Department of Agrarian Development)

The five vocational training schools currently participating in the Women Farmers Support Project.

In the medium to long term, an expansion to approximately 100 vocational training schools nationwide is envisioned

Applicability of Japanese Technologies

Women Farmers Support Project delivers two entry-level trainings: a basic horticulture course and an introductory tractor operation course for small-scale horticultural farmers. This proposal positions the introduction of inputs and machinery to support “upgrading of production technologies” under the horticulture course and “improving work efficiency” under the tractor course, with the following as a core element.

First, strengthen farmers’ capacity to adopt and adapt to new varieties. This will be pursued through the selection and dissemination of high-yielding, disease-resistant F1 hybrids and varieties with strong processing and storage traits, thereby lowering barriers for trainees to introduce new varieties and enabling expansion into contract farming as referenced in Sections 2.5.2 and 2.5.3. Field surveys confirmed a proven track record by Sakata Seed Corporation¹⁷⁵ in introducing varieties such as cabbage and tomato and the high quality of these varieties. By incorporating the company’s expertise—e.g., sharing nursery/seedling-raising know-how—there is potential to broaden the range of varieties cultivated by small-scale farmers.

Next, improvements in soil, water, and fertilizer management will be pursued. This includes

¹⁷⁵ Sakata Seed Corporation. <https://www.sakataseed.co.jp/>, (Accessed 2026-02-01).

correcting soil acidification observed in some regions through liming and application of organic matter; introducing simple drip irrigation; and, considering climate change impacts and rising production costs, strengthening drought resilience using water-retaining agents. In this regard, EF Polymer Co., Ltd. offers a water-retaining material derived from crop residues which, when mixed into soil, is expected to promote root development even where water and fertilizers are limited¹⁷⁶. Field interviews confirmed potential effectiveness in sandy soils and for seedlings, berries, and protected cultivation. The company donated 5 tons of product to Ukrainian producers in 2024 and, in February of the same year, participated in the Japan-Ukraine Conference for Promotion of Economic Growth and Reconstruction, signing a letter of intent with Ukravit Company Ltd on a project aimed at local production and use of EF Polymer¹⁷⁷. These indicate a strong interest in the Ukrainian market.

From the perspective of improving operational efficiency, Agri Info Design, Ltd. provides the GPS-based tractor guidance system “AgriBus.” Its core component, AgriBus-NAVI, is an Android GPS/GNSS guidance application that requires no special hardware and can be used with a smartphone alone. It enables straight-line driving and guidance of work paths for tractors, combines, and other farm machinery in the field, contributing to improved accuracy in ridging, seeding, fertilizing, and pesticide application, reduced working time, and optimal use of inputs. A free version is available, allowing relatively low-cost, easy adoption and operation, making it suitable for smallholders and women farmers¹⁷⁸. The system has been downloaded in over 140 countries and already has about 4,000 active users in Ukraine, with further uptake expected.

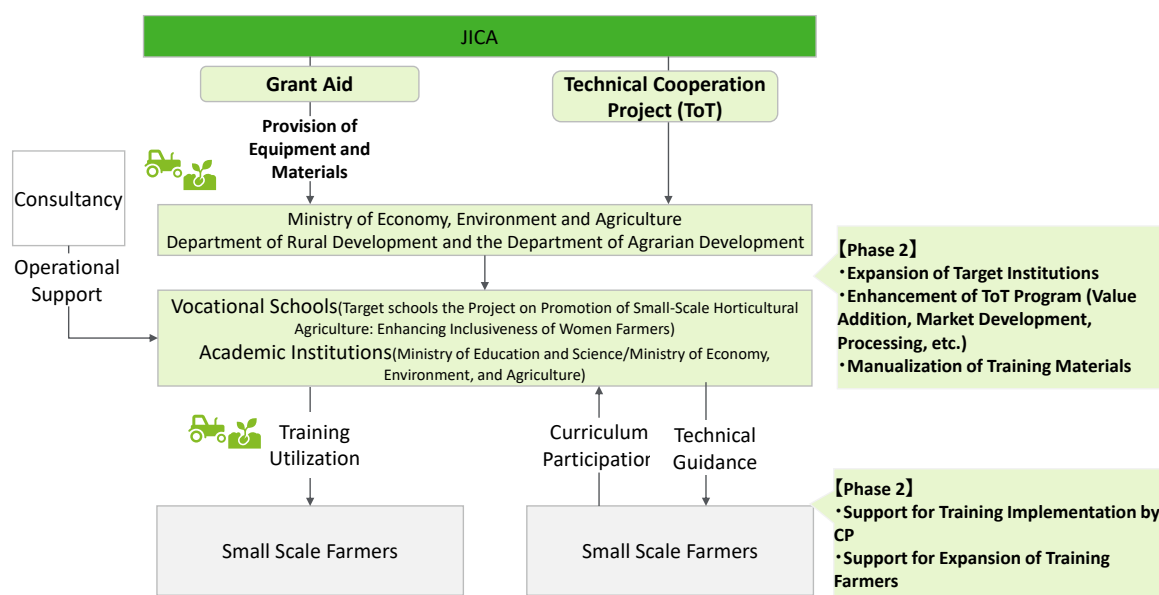
Other Considerations

- The project cost is subject to change depending on factors such as the target regions, the number of vocational training schools, the scale and type of equipment to be introduced, local price levels, exchange rate fluctuations, and the security situation.
- The vocational training schools to be targeted for support will need to be selected separately based on criteria such as their capacity to manage equipment and materials, security risks, and the distribution of small-scale enterprises in their surrounding areas.

¹⁷⁶ EF Polymer Website, <https://efpolymer.jp/about>, (Accessed 2026-02-01).

¹⁷⁷ Ministry of Foreign Affairs of Japan. “2024/2/19 Japan-Ukraine Conference for Promotion of Economic Growth and Reconstruction”. <https://www.mofa.go.jp/files/100622724.pdf>, (Accessed 2026-02-04).

¹⁷⁸ AGRI INFO DESIGN. <https://agri-info-design.com/>, (Accessed 2026-02-02).



Source: JICA survey team

Figure 6.1.1 Project on Promotion of Small-Scale Horticultural Agriculture: Enhancing Inclusiveness of Women Farmers (Phase 2) (Technical Cooperation Project and Grant Aid)

6.2 Technology Demonstration and Dissemination Project through Governmental Research Institutions (Technical Cooperation Project)

The second initiative is a technology demonstration and dissemination project that involves providing materials, equipment, and facilities to government research institutions to verify the applicability of Japanese technology. The objective of this initiative is to facilitate the smooth introduction of technologies tailored to local conditions by conducting objective and scientific verification at these institutions, thereby enhancing the reliability and dissemination potential of the introduced technologies.

This initiative is envisioned to extend beyond the basic technical guidance provided at vocational training schools as described above. It will involve activities such as the exhibition and verification of demonstration greenhouses in the field, the validation of climate change adaptation technologies (e.g., water retention and irrigation), and performance trials of new seed varieties. Initial target institutions are expected to include the Ukrainian Institute for Soil Protection, the Ukrainian Research Institute for Agricultural Machinery and Technology Forecasting and Testing, and the Ukrainian Institute for Plant Variety Examination, which have previously received agricultural equipment and materials through Emergency Grant Aid for Recovery.

Several challenges in vegetable production have been identified: a lack of appropriate variety selection, underdeveloped production technologies, a shortage of storage facilities, damage to production sites coupled with increased costs for soil improvement and fertilization at relocation sites, and the rising expense of introducing and maintaining protected cultivation. Addressing these issues requires specific technologies, including those for introducing disease and drought resistant varieties, soil improvement and irrigation management, low-cost storage and refrigeration, efficient facility

operation and energy conservation, climate change adaptation, and strengthening the value chain through mechanisms such as contract farming.

On the other hand, for berries, key challenges include declining yields and quality due to frost damage from climate change, as well as unstable producer income caused by market price collapses when supply is concentrated during the harvest season. To address these issues, the introduction of technologies for frost damage control, cultivation management for quality improvement, and simple pre-cooling and preservation techniques is also envisioned.

Thus, vegetables and berries each face distinct and apparent production challenges, making it essential to develop and introduce technologies tailored to field-level conditions. It is considered highly beneficial for this support initiative to verify the practicality and effectiveness of these technologies under local conditions. This will be achieved through field demonstrations, performance verifications, validation of climate-adaptive technologies, and local adaptability assessments of new seeds and materials at government research institutions.

The results and findings from these demonstrations will be widely shared through relevant organizations and producer networks to promote technology dissemination and stimulate interest in adoption at the local level.

In the medium to long term, this initiative can be positioned as a measure to promote the dissemination and establishment of technologies at the field level. This will be achieved by combining these demonstration results with Grant Aid and Technical Cooperation projects, as mentioned in section 6.1, and by facilitating knowledge sharing and trial use for enterprises and producers. This is expected to contribute to the establishment of sustainable production systems resilient to external risks like climate change, the stabilization of agricultural management, and the revitalization of the local economy in Ukraine's vegetable and berry sectors.

Project Objective

To establish an effective technology introduction model for addressing local production challenges—such as improving the yield and quality of vegetables and berries, adapting to climate change, and stabilizing agricultural management—by verifying the applicability of advanced Japanese agricultural technologies, materials, equipment, and facilities within Ukraine.

Beneficiaries

Ukrainian agricultural research institutions and technical instructors.

In the medium to long term, local producers—including large-scale enterprises, small to medium-sized enterprises, and households—are envisioned as the ultimate beneficiaries.

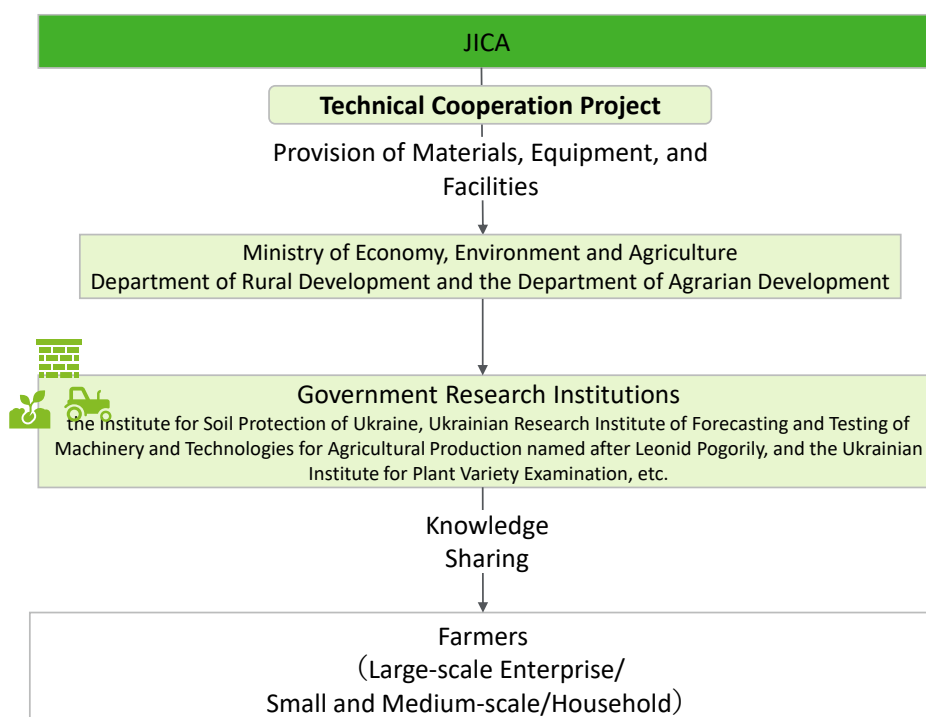
Implementing Agencies

Ministry of Economy, Environment and Agriculture (Department of Rural Development and Department of Agrarian Development),

Agricultural research institutions under the Ministry of Economy, Environment, and Agriculture of Ukraine (e.g., the Institute for Soil Protection of Ukraine; Ukrainian Research Institute of Forecasting and Testing of Machinery and Technologies for Agricultural Production named after Leonid Pogorily; and the Ukrainian Institute for Plant Variety Examination).

Applicability of Japanese Technologies

Government research institutions will also consider introducing materials and equipment similar to the Japanese technologies outlined in Proposal 6.1. The key difference lies in the approach: government research institutions will conduct preliminary verification through field trials and demonstrations to assess the adaptability, cost-effectiveness, and regulatory compliance of the new materials, equipment, and varieties before introducing them to vocational training schools. After evaluating their adaptability, cost-effectiveness, and regulatory compliance, the findings will be transferred to vocational training schools as part of their educational curriculum and teaching materials, thereby accelerating on-site implementation.



Source: JICA survey team

Figure 6.2.1 Technology Demonstration and Dissemination Project through Governmental Research Institutions (Technical Cooperation Project)

CHAPTER7 TRENDS IN JAPAN, THE EU, OTHER DONORS, AND COMPANIES

7.1 JICA

7.1.1 The Programme for Emergency Recovery

Ukraine has suffered severe damage to its socioeconomic infrastructure following the Russian invasion since February 2022. In response to this situation, JICA is implementing the Grant Aid "Programme for Emergency Recovery." This programme contributes to rebuilding the lives of the Ukrainian people and establishing the essential foundation for future full-scale reconstruction. The assistance is continuously provided based on the country's urgent needs and covers a wide range of sectors, including critical infrastructure such as power, energy, and transportation, as well as humanitarian demining, education, and health. In the agricultural sector, support has been provided with the aim of restoring food production, including the provision of sunflower and maize seeds and the supply of agricultural machinery to research institutions.

Table 7.1.1 The Programme for Emergency Recovery: Phases 1–4

Phase	Description of Assistance	Implementing Agency	Date of Grant Agreement Signed	Grant Amount (Limit)
Phase1 ¹⁷⁹	① Equipment Procurement Procurement includes: equipment for humanitarian demining and explosive ordnance disposal (EOD), machinery for debris removal and disaster waste management, materials for transport infrastructure rehabilitation, power and energy supply rehabilitation, water supply and sewage treatment, as well as medical, educational, and agricultural equipment, and all related accessories and spare parts. Note: The specific types of equipment and facilities are subject to change according to the evolving needs of the recipient country, given the fluid situation on the ground. ② Consulting Services Not Applicable	State Emergency Service, Ministry for Communities, Territories and Infrastructure Development, Ministry of Energy, Ministry of Health, Ministry of Education and Science, Ministry of Agrarian Policy and Food	March 2023	JPY22.4 billion
Phase2 ¹⁸⁰	① Equipment Procurement Procurement includes: equipment for humanitarian demining and EOD, machinery for debris and disaster waste management, materials for rehabilitating transport, power, and energy infrastructure (including associated facilities), as well as equipment for water supply, medical, educational, agricultural, and broadcasting purposes, along with all related accessories and spare parts. Note: The specific types of equipment and facilities are subject to change according to the evolving needs of the recipient country, given the fluid situation on the ground. ② Consulting Services Not Applicable	Ministry for Development of Communities and Territories, Ministry of Energy, State Emergency Service of Ukraine (SESU), Ministry of Education and Science, Ministry of Health (MoH), Ministry of Agrarian Policy and Food, Public Broadcasting Company of Ukraine, Local self-government bodies	April 2023	JPY53.1 billion

¹⁷⁹ JICA. "The Programme for Emergency Recovery". ODA Project Website. <https://www.jica.go.jp/oda/project/2260670/index.html>, (Accessed 2025-08-24)

¹⁸⁰ JICA. "The Programme for Emergency Recovery (Phase 2)". ODA Project Website. <https://www.jica.go.jp/oda/project/2260870/index.html>, (Accessed 2025-08-24)

Phase3 ¹⁸¹	① Equipment Procurement Procurement includes: rehabilitation of power & energy facilities and transport infrastructure, humanitarian demining and EOD, telemedicine and psychological rehabilitation, and all related accessories and spare parts. ② Consulting Services Services include: detailed design, bidding assistance, construction supervision, procurement management, and technical guidance on the operation and maintenance (O&M) of the provided facilities and equipment.	State Emergency Service of Ukraine (SESU), Ministry for Development of Communities and Territories, Ministry of Energy, Ministry of Health (MoH), Ministry of Education and Science, Ministry of Agrarian Policy and Food	February 2024	JPY15.8 billion
Phase4 ¹⁸²	① Equipment Procurement Procurement includes: equipment for humanitarian demining and EOD, materials for power and energy facilities, water supply systems, medical use, road maintenance, educational facilities, and border control, as well as other related items and accessories. ② Consulting Services Services include: bidding assistance, equipment installation, and technical guidance on the operation and maintenance (O&M) of the provided equipment.	Ministry for Development of Communities and Territories, Ministry of Energy, Ministry of Internal Affairs (MIA), Ministry of Education and Science (MES), State Agency for Restoration and Infrastructure Development of Ukraine, Local self-government bodies	April 2025	JPY 8.8 billion

7.1.2 Project for Supporting Smallholder Horticultural Farmers Including Women Farmers with Training

In the agricultural sector of Ukraine, the prolonged conflict has led to a situation where women are assuming an increasingly crucial role in agricultural production. Against this backdrop, on June 19, 2024, the Record of Discussions (R/D) for the "Project for Supporting Smallholder Horticultural Farmers Including Women Farmers with Training" was signed with the Government of Ukraine. The objective of this project is to contribute to the country's food security through the improvement of production techniques and business management skills among horticulture farmers, with a particular focus on the empowerment of women farmers.

¹⁸¹ JICA. "The Programme for Emergency Recovery (Phase 3)". ODA Project Website. <https://www.jica.go.jp/oda/project/2360800/index.html>, (Accessed 2025-08-24)

¹⁸² JICA. "Signing of Grant Agreement with Ukraine : Providing equipment to promote emergency recovery and sustainable economic reconstruction (The Programme for Emergency Recovery Phase 4) ". https://www.jica.go.jp/information/press/2025/20250407_11.html, (Accessed 2025-08-24)

The main activities include: (i) analyzing challenges and formulating improvement measures in the horticulture sector; (ii) developing and implementing training programs based on local needs; and (iii) conducting training in Japan for officials of the Ministry of Agrarian Policy and Food of Ukraine. These activities are expected to contribute to the achievement of the Sustainable Development Goals (SDGs), specifically Goal 2 (Zero Hunger), Goal 5 (Gender Equality), and Goal 8 (Decent Work and Economic Growth).

Table 7.1.2 Project for Supporting Smallholder Horticultural Farmers Including Women Farmers with Training

Project Title	Project for Supporting Smallholder Horticultural Farmers Including Women Farmers with Training
Project Period	29 months
Implementing Agency	● Ministry of Agrarian Policy and Food ● Ministry of Education and Science
Main Activities (Tentative)	● To identify challenges in the horticulture sector and propose measures for its enhancement ● To develop training programs tailored for horticulture farmers ● To deliver training to horticulture farmers in collaboration with local training institutions

7.1.3 Ukraine Business Support Project

The utilization of technologies and expertise from Japanese private companies is crucial for the recovery and reconstruction of Ukraine. Against this backdrop, JICA has launched the "FY2024 JICA Ukraine Business Support Project," selecting projects from a total of 14 companies in various sectors, including infrastructure development, transport and traffic, energy, and education.

In the agricultural sector, two companies have been selected: Yamada Bee Farm Inc., and Kakuichi Co., Ltd. The survey by Kakuichi Co., Ltd. is particularly relevant to the vegetables and berries targeted by this Project. The company plans to conduct a needs assessment in Poltava and Odesa Oblasts from September 2024 to April 2025. The objective of this assessment is to confirm the technical applicability and marketability of its irrigation hoses and nano-bubble generators by verifying their effects, such as increased yields, improved quality, and soil decontamination.

Table 7.1.3 Survey Overview of Kakuichi Co., Ltd.

Survey Period	September 2024 to April 2025
Target Oblasts	Poltava Oblast, Odesa Oblast
Survey Overview	A needs assessment to confirm the technical applicability and marketability of irrigation hoses and nano-bubble generators. Technical applicability includes verifying effects such as increased yields, improved quality, soil decontamination, and product localization. Following this project, the company aims to contribute to the recovery and enhancement of Ukraine's agriculture by selling and distributing these products through local partners.
Business Model	● The model targets small and medium-sized agricultural producers ● After-sales services, including specification finalization, sales, installation, and maintenance, are provided through local distributors and installers. The company will offer technical support to these partners

Expected Development Impact	● Products will initially be exported from Japan, while the establishment of a local production system is considered for the medium to long term
	● The irrigation hoses are suitable for emergency measures, recovery, and reconstruction of irrigation facilities, as they are more cost-effective and can be installed in a shorter period compared to structural solutions ● The combined use of nano-bubble generators enhances soil water retention and fertility even with limited water resources. This is expected to increase crop yields and quality, thereby contributing to the recovery of agricultural productivity

7.1.4 G7-Coordinated Extraordinary Revenue Acceleration (ERA) Loan for Ukraine

Ukraine is facing a severe fiscal crisis due to the prolonged conflict, making the maintenance of basic state functions and the stabilization of citizens' lives critical challenges. In response, the Government of Japan, in coordination with the G7, has utilized the "Extraordinary Revenue Acceleration (ERA) Loans" framework. As part of this initiative, on June 5, 2025, Japan signed an loan agreement titled the "Extraordinary Revenue Acceleration Loan for Ukraine" for an amount up to 471.9 billion JPY.

This framework enables the accelerated provision of loans without creating new debt obligations for Ukraine by using the extraordinary revenues generated from immobilized Russian sovereign assets as the source for repayment. Provided as direct budget support, this loan will help finance the fiscal deficit, thereby contributing to ensuring the continuity of administrative functions and public services, which are essential for the country's social and economic recovery.

7.2 Japan (excluding JICA)

7.2.1 Japan-Ukraine Joint Task Force for Agricultural Reconstruction

On October 3, 2023, Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) and Ukraine's Ministry of Agrarian Policy and Food agreed to establish the "Japan-Ukraine Joint Task Force on Revitalization Strategy of Agriculture ." This Task Force aims to explore concrete measures for the recovery and reconstruction of the Ukrainian agricultural sector by leveraging Japan's technologies, strengths, and experience in post-earthquake reconstruction.

In addition to facilitating dialogue between policy authorities, the Task Force also promotes the participation of Japanese companies in fields such as agricultural machinery and materials, irrigation technology, and agricultural IoT. As of July 2025, a total of three meetings have been held.

Table 7.2.1 Overview of the Japan-Ukraine Joint Task Force for Agricultural Reconstruction

Date	Overview
First Meeting (November 1, 2023)	Approximately 100 public and private sector representatives from Japan participated. Based on the interests expressed by the Ukrainian side, discussions focused on support needs and future steps, with a particular emphasis on the agricultural machinery sector. It was agreed to advance concrete cooperation through online matchmaking and by inviting Ukrainian officials to Japan, and to accelerate reconstruction efforts in the agricultural sector ahead of the "Japan-Ukraine Conference for Promotion of Economic Reconstruction" in early 2024.
Second Meeting (April 5, 2024)	Approximately 120 participants from the Japanese side attended. Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) reported on the agricultural sector

	outcomes from the Japan-Ukraine Conference for Promotion of Economic Reconstruction held in February. MAFF also requested cooperation for the smooth implementation of programs to invite Ukrainian officials to Japan and conduct survey projects. Additionally, Japanese businesses and related organizations presented their concrete action plans. In response, the Ukrainian side expressed its intention to leverage Japan's support to achieve the recovery and development of its agricultural sector.
Third Meeting (January 29, 2025)	Approximately 90 participants from government agencies and agriculture-related companies of both countries attended. The Japanese side shared with its Ukrainian counterpart the progress of reconstruction support initiatives implemented in the agricultural sector during 2024. MAFF explained its initiatives based on public-private partnerships, and five Japanese private companies reported on their activities and future plans (detailed in section 5.2.2). Meanwhile, Ukraine's Ministry of Agrarian Policy and Food presented progress on its agricultural policies, including the signing of Memorandums of Cooperation (MoCs) in 2024. The Ministry also expressed its intent to utilize Japanese technology and experience to realize more efficient agriculture and promote economic growth.

7.2.2 MAFF's Support for Ukraine's Agricultural Recovery

To give concrete form to the agreements reached by the "Japan-Ukraine Joint Task Force on Revitalization Strategy of Agriculture," Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF) is implementing the "Support for Agricultural Recovery in Ukraine" project. This project is funded by the supplementary budgets for Fiscal Year (FY) 2023 and FY2024 and is contracted out to private companies and other entities selected through a public call for proposals. The supported projects are broadly categorized into the following four types:

1. **Feasibility Studies (F/S):** Survey activities to assess the applicability of Japanese companies' technologies and products. This includes support for establishing product logistics, building support systems, and securing local partners (including in neighboring countries).
2. **Invitation of Ukrainian Government Officials:** Initiatives to deepen understanding of Japanese companies' technologies and products by inviting key Ukrainian personnel to Japan for site visits and opinion exchanges.
3. **Dispatch of Engineers and Specialists:** Support for initiatives that facilitate the introduction of Japanese technologies and products, such as dispatching agricultural engineers and specialists to Ukraine and neighboring countries to provide training to local stakeholders.
4. **Strengthening of Supply Chains (newly established under the FY2024 supplementary budget):** Support for initiatives that contribute to strengthening Ukraine's supply chains, such as surveying new procurement and sales channels for Ukrainian agricultural products and biomass, and conducting quality verification.

Under the "FY2023 Supplementary Budget Project for Supporting the Recovery of Agricultural Productivity in Ukraine," five companies were selected: Mayekawa Mfg. Co., Ltd., Mebiol Inc., AC Biode Inc., Kakuichi Co., Ltd., and NTC International Co., Ltd. These companies conducted Feasibility Studies (F/S) and other activities leveraging their unique technologies and expertise. Subsequently,

under the "FY2024 Supplementary Budget Emergency Support Project for Agricultural Recovery in Ukraine," a total of five companies have been selected as prospective subsidy recipients. These include two companies continuing from the previous fiscal year—Mayekawa Mfg. Co., Ltd., and NTC International Co., Ltd.—as well as three new companies: Green Co., Ltd., Seiwa Co., Ltd., and Zensho Holdings Co., Ltd. Furthermore, as of July 2025, a second public call for proposals for this project is underway, and it is expected that additional companies will be selected.

7.3 EU

7.3.1 FAO-EU Support Project for Aggregation Models

With support from the European Union (EU), the Food and Agriculture Organization (FAO) is implementing a grant program aimed at establishing aggregation models as a pilot program for Ukrainian agriculture. Focusing on berries and vegetables, this project encourages the development of business models that enable smallholder farmers to effectively participate in the supply chain at various stages, including efficient collection, storage, processing, and sales. By reducing post-harvest losses and improving access to domestic and international markets, the program is expected to contribute to the sustainable livelihood improvement of rural communities.

The program is structured around two core components: financial support and technical assistance. The financial support component provides grants of up to 150,000 USD to agricultural enterprises that can integrate smallholder farmers into their operations and provide infrastructure for storage and logistics, on the condition that beneficiaries co-finance at least 50% of the total investment. Eligible regions are Lviv, Zakarpattia, Ivano-Frankivsk, and Chernivtsi Oblasts, with priority given to projects that introduce environmentally friendly technologies or innovative business solutions. In addition, comprehensive technical assistance and mentorship are provided, including expert consultations and training sessions on business management and value chain integration. Applications were accepted through the State Agrarian Register (SAR) of Ukraine until March 17, 2025.

7.3.2 The Dutch Government's "Rebuilding Potato Ukraine" Program

This project is funded by the Netherlands Enterprise Agency (RVO) within the framework of the Ukraine Partnership Facility (UPF) program, which aims for the sustainable economic and social reconstruction of Ukraine. The UPF prioritizes sectors such as water, healthcare, agriculture, and sustainable energy, and this project is positioned as one of the first seven approved under the program¹⁸³.

The project's objective is to address the structural challenges facing Ukraine's potato industry. By improving access to high-quality and affordable seed potatoes, it seeks to enhance productivity, sustainability, and profitability, thereby contributing to short-term food security and building a foundation for medium- to long-term economic development. Key elements also include improving food security by increasing the supply of high-quality table potatoes and introducing Dutch expertise and

¹⁸³ RECOVERY UKRAINE. "Ukraine Partnership Facility – UPF". 2024-09-20. <https://recovery-ukraine.com/ukraine-partnership-facility-upf/>, (Accessed 2025-08-24)

equipment as a climate change adaptation measure. At the core of this initiative is the "Climate Smart Potato Demonstration Center," established and operated with an investment of approximately 2.27 million EUR. The center functions as a training and demonstration hub for farmers, covering the entire process of seed potato cultivation, from irrigation techniques to storage and packaging. Through production activities on 100 hectares annually using drip irrigation, it is expected to contribute 53 million kg of table potatoes to the annual supply.

Additionally, education is a key pillar. Comprehensive capacity building is provided for approximately 3,000 farmers (over 60% of whom are women), consisting of hands-on training at the center and remote training via digital tools such as short videos, Facebook, WhatsApp, and YouTube. The training covers a wide range of topics, including Good Agricultural Practices (GAP), equipment operation, cold storage facility management, regenerative agriculture, and business planning. In 2024, a total of 511 participants attended 13 training sessions on topics such as soil preparation, use of potato planting equipment, sprayer settings, early potato cultivation, and storage techniques¹⁸⁴. These efforts are expected to boost sales and profitability for Ukrainian farmers through increased yields and reduced production costs.

In terms of the implementation structure, Agrico Netherlands, a global leader in seed potato development, production, and distribution, is responsible for overall project management and reporting. The Dutch APH Group, one of the world's largest distributors of equipment and installations for grain, potato, and vegetable businesses, handles the training of Agrico Ukraine's trainers, supplies various equipment, and provides after-sales service. Agrico Ukraine, a leader in the Ukrainian seed potato market, is responsible for establishing and locally operating the demonstration center and educating Ukrainian farmers.

As this project involves the expansion and modernization of existing domestic operations rather than the development of a new one, it is expected to make a rapid contribution to food security.

7.3.3 The Swiss Government's "Quality Food Trade Program"

The Swiss Government is implementing the "Higher Value-Added in the Organic and Dairy Sectors of Ukraine" project, a development cooperation initiative commonly known as the Quality Food Trade Program (QFTP). The program aims to enhance the competitiveness of small and medium-sized enterprises (SMEs), promote sustainable trade, and create jobs in Ukraine's organic and dairy sectors. Its core objective is to align Ukraine's regulatory framework and business environment with EU standards to improve the trading capacity for high value-added products in both domestic and international markets. To achieve this, the project works in collaboration with public and private stakeholders to improve existing regulations and build the foundation for effective control and inspection mechanisms. Furthermore, it seeks to strengthen Ukraine's risk-based management

¹⁸⁴ AGRICO. "CLIMATE SMART POTATO DEMONSTRATION CENTRES". <https://www.agrico.com.ua/en/agrico-demo-centers>, [Agrico Demo Centers](#), (Accessed 2025-08-24)

capabilities by supporting the enhancement of risk assessment capacities, the development and implementation of risk-based inspection procedures, and the institutional strengthening of relevant organizations.

The project's specific activities are diverse, ranging from institutional development to on-the-ground capacity building. At the institutional level, it has supported the formulation of key regulations, such as Order No. 118 of the Ministry of Agrarian Policy and Food of Ukraine (dated March 12, 2019), through expert assistance to harmonize the country's legal framework with EU standards¹⁸⁵. To ensure a scientific basis for this process, independent scientific expert groups have been established in six fields, including veterinary medicine and public health, to provide professional advice for risk management processes¹⁸⁶. Next, to build the capacity of enforcement agencies, training of trainers sessions on risk-based inspection have been conducted for specialists from the State Service of Ukraine on Food Safety and Consumer Protection (SSUFSCP). Regarding market infrastructure, the project supports the rollout of the "Dairy Module," a platform for quality and safety management across the entire food chain, with 1,836 companies connected to the system as of September 2024¹⁸⁷. Furthermore, as direct support to producers and processors, competitive funding in the form of small grants is provided to improve production processes. In the autumn of 2023, 16 grant applications were selected¹⁸⁸. These grants also serve as support for recovery from the full-scale invasion and, combined with practical training on topics such as mastitis diagnosis and treatment, herd management, artificial insemination, and hygiene management, they contribute to improving productivity and food safety at the field level.

The project is funded by the Swiss State Secretariat for Economic Affairs (SECO) and implemented by the Research Institute of Organic Agriculture (FiBL) in partnership with SAFOSO AG. The project period is divided into two phases: the first phase ran from August 2019 to June 2023 and has been completed¹⁸⁹. The second phase is currently underway, scheduled to run until June 2026. Activities under this phase are planned for continuous approval based on the evolving situation.

¹⁸⁵ State sites of Ukraine. "Representatives of the private and public sectors discussed the needs of the dairy sector during QFTP Sounding Board". 2024-06-21. <https://dpss.gov.ua/en/news/representatives-of-the-private-and-public-sectors-discussed-the-needs-of-the-dairy-sector-during-qftp-sounding-board>, (Accessed 2025-08-24)

¹⁸⁶ Quality FOOD Trade Program. "The State Service of Ukraine on Food Safety and Consumer Protection Holds First Meeting with Members of Approved Scientific Expert Groups on Risk Assessment". 2024-12-05. <https://qftp.org/en/news/the-state-service-of-ukraine-on-food-safety-and-consumer-protection-holds-first-meeting-with-members-of-approved-scientific-expert-groups-on-risk-assessment/>, (Accessed 2025-08-24)

¹⁸⁷ Quality FOOD Trade Program. "Switzerland Will Continue to Support the Development of Small and Medium-Sized Enterprises in Ukraine's Organic and Dairy Sectors". 2024-09-05. <https://qftp.org/en/news/switzerland-will-continue-to-support-the-development-of-small-and-medium-sized-enterprises-in-ukraine-s-organic-and-dairy-sectors/>, (Accessed 2025-08-24)

¹⁸⁸ Quality FOOD Trade. "Program Summary of the Results of Service Providers in the Dairy Sector Supported by Switzerland". 2024-08-30. <https://qftp.org/en/news/summary-of-the-results-of-service-providers-in-the-dairy-sector-supported-by-switzerland/>, (Accessed 2025-08-24)

¹⁸⁹ State sites of Ukraine. "Switzerland continues to support Ukraine in its European integration course and development of organic and dairy sectors of Ukraine". 2023-09-12. <https://dpss.gov.ua/en/news/switzerland-continues-to-support-ukraine-in-its-european-integration-course-and-development-of-organic-and-dairy-sectors-of-ukraine>, (Accessed 2025-08-24)

7.4 Others

7.4.1 Canada-SOCODEVI Support for the Dairy Sector

This project is promoted with primary funding from Global Affairs Canada (GAC) and implemented by SOCODEVI (Société de coopération pour le développement international), a Canadian international cooperation organization. It aims to enhance the competitiveness of Ukraine's dairy sector, promote the growth of small- and medium-scale dairy farmers (particularly women), and improve the economic well-being of rural communities.

The first phase, aimed at enhancing the competitiveness of Ukraine's dairy sector, was implemented from 2008 to 2014 in Lviv and Dnipropetrovsk Oblasts under a bilateral agreement between Canada and Ukraine. During this phase, SOCODEVI, in partnership with local extension service agencies—Lviv Agricultural Extension Services (LADS) and Dnipropetrovsk Agricultural Advisory Services (DAAS)—led the establishment of dairy cooperatives¹⁹⁰. This initiative was supported by funding and technical assistance from Danone, Heifer International, and the Ukrainian government, with the Canadian dairy expertise center Valacta (now Lactanet) participating as a technical advisor. These efforts established a foundation for business development centered on cooperatives and optimized dairy product marketing. Additionally, Valacta conducted a feasibility study for the subsequent phase, paving the way for future project expansion.

Although the number of participating farmers was limited in the first phase, the results contributed to a better understanding of dairy farming characteristics in the target regions. Concurrently, three key lessons were learned: (1) the feasibility of implementing Dairy Management Services (DMS) tailored to the existing farm structures in the target regions; (2) the importance of setting service fees at a level acceptable to farmers; and (3) the effectiveness of a project design featuring Valacta as the main technical partner.

Building on these outcomes, the successor project, the "Ukraine Dairy Business Development Project (UDBDP)", was launched¹⁹¹ and ran from 2014 to 2021¹⁹². The project was designed to address deep-seated challenges—instability in quality, supply, and price—stemming from an industrial structure where smallholder farmers accounted for 80% of domestic raw milk production (as of 2013). It also aimed to overcome a wide range of constraints, such as underdeveloped milk collection and cooling infrastructure, barriers to credit access, and insufficient knowledge of feed quality and business management. By addressing these issues, the project sought to enhance the competitiveness of Ukraine's

¹⁹⁰ Government of Canada, "Project profile - Improving the Competitiveness of the Dairy Sector". <https://w05.international.gc.ca/projectbrowser-banqueprojets/project-projet/details/z020898001>, (Accessed 2025-08-24)

¹⁹¹ MiCDP. "Ukraine Dairy Business Development Project (UDBDP)". <https://micdp.coops4dev.coop/project/ukraine-dairy-business-development-project-udbdp>, (Accessed 2025-08-24) * Please note that the period is specified as March 2020 to September 2025

¹⁹² THE GLOBAL STANDARD FOR LIVESTOCK DATA. "Implementation of dairy herd management services in Ukraine". https://www.icar.org/Documents/technical_series/ICAR-Technical-Series-no-21-Puerto-Varas/Monardes.pdf, (Accessed 2025-08-24)

dairy industry, facilitate expansion into European and Asian markets, and ultimately improve the economic welfare of rural communities in the target regions. The project targeted 5,000 small- and medium-scale dairy farmers belonging to 24 cooperatives in Lviv and Dnipropetrovsk Oblasts, working to improve their production and marketing capabilities across the entire value chain.

The main activities of the UDBDP consisted of the development of physical and digital infrastructure and human capital formation. As for physical infrastructure, modern dairy laboratories were established in Lviv and Dnipropetrovsk Oblasts in October 2015, providing services such as component and microbial analysis of raw milk (processing approximately 6,000 samples per month as of June 2016). On the digital infrastructure front, the project managed individual cow production and health data, along with feed analysis, using software provided by Valacta (Lac-T and Ration-L) to promote science-based herd management.

For human capital formation, Valacta staff served as primary trainers, conducting practical training in various formats for the staff of the extension service agencies (LADS and DAAS) to strengthen their on-the-ground guidance capabilities. Following the full-scale invasion by Russia, the Canadian government provided approximately 1.98 million USD in additional funding (June 2022–June 2024¹⁹³) by modifying and extending the existing UDBDP framework to bolster food security and enhance the sector's resilience. This additional support focused not only on sustaining raw milk production but also on increasing added value through processing, leading to the construction and commissioning of the 'Nabil' cooperative dairy processing plant, with a daily capacity of 25,000 liters¹⁹⁴. The plant, which opened in July 2023, has begun producing items like yogurt and is already supplying products to retail markets in Lviv and Ivano-Frankivsk Oblasts.

7.4.2 FAO-IOM Dairy-Related Support in Sumy Oblast

Under the framework of the Ukraine Community Recovery Fund (UCRF), the Food and Agriculture Organization (FAO) and the International Organization for Migration (IOM) are jointly implementing a comprehensive support project aimed at the economic recovery of communities and livelihood support for residents in the conflict-affected Sumy Oblast.

Of these efforts, FAO is leading the reconstruction of the agricultural sector through its project, "Promoting community-based agricultural livelihood recovery and strengthening agri-food value chains in conflict-affected areas of Sumy Oblast (PERAL Sumska)." This project aims to address pressing challenges such as reduced cultivated land area and damaged production infrastructure, thereby enhancing regional resilience and promoting economic development. Adopting a strategic approach, it focuses on three key value chains—dairy, beekeeping, and aquaculture—to improve productivity and

¹⁹³ Government of Canada. "Project profile - Ukraine Dairy Business Development". <https://w05.international.gc.ca/projectbrowser-banqueprojets/project-projet/details/p000523002>, (Accessed 2025-08-24)

¹⁹⁴ MilkUA.info. "Перша продукція кооперативного молокозаводу «Набіл» уже надійшла у продаж". <https://milkua.info/uk/post/persa-produkcija-kooperativnogo-molokozavodu-nabil-uze-nadijsla-u-prodaz>. 2023-10-16, (Accessed 2025-08-24)

create livelihood recovery opportunities in rural areas.

The project's specific support features a multi-layered design, encompassing interventions from direct assistance to individual producers to strengthening the sector's overall foundation. Firstly, it provides conditional cash transfers of 1,000 USD per household to 1,140 farms and family-run enterprises engaged in dairy, beekeeping, and aquaculture, contingent upon their completion of vocational training¹⁹⁵. This support combines "hard" interventions, enabling the procurement of construction materials for barn repairs and equipment like milking and cooling units, with "soft" support, such as technical guidance and extension services, to foster sustainable production capacity. In parallel with this direct support, the project takes a more structural approach by assisting in the development of a Genetic Resource Enhancement Strategy for the Sumy Oblast dairy value chain. This aims to build a system for the planned introduction of improved genetic resources while preserving the genetic diversity of local Brown Swiss cattle, thereby raising the entire sector's productivity and expertise. These activities are coordinated with capacity building for local institutions, with the long-term goal of expanding commercialization opportunities and more comprehensively integrating small-scale producers into the value chain.

In parallel with FAO's agricultural sector support, IOM addresses the multifaceted challenges caused by the conflict and undertakes broader regional economic recovery and livelihood support through its project, "Community Recovery by Ensuring a Favorable Economic and Agricultural Environment in Sumy Oblast." Its activities range from direct support at the individual and household levels to rebuilding the economic foundation. At the individual and household level, livelihood support grants are provided to 711 rural households for purposes such as purchasing agricultural inputs¹⁹⁶. A clear focus on vulnerable groups is evident, with 66% of recipient households being female-headed and 11% including persons with disabilities. Concurrently, IOM supports individual livelihood capacity by providing vocational training in in-demand occupations, such as tractor operation, to 63 people (including 49 women), targeting displaced persons and others. Next, to rebuild the regional economic base, it promotes infrastructure restoration, such as repairing damaged food shops and providing construction materials to 10 small businesses. Furthermore, it directly stimulates the revival of local economic actors by awarding grants of 7,000 USD each to 30 micro-enterprises and 20,000 USD each to 13 small enterprises.

Both projects are grounded in several cross-cutting considerations that serve as common guiding principles. First, they prioritize addressing the needs of diverse vulnerable groups, including a focus on gender equality, disability inclusion, youth, internally displaced persons (IDPs), and veterans. Recognizing the vital role women play in agriculture and the challenges faced by female-headed

¹⁹⁵ UNDP. "General Information". https://mptf.undp.org/sites/default/files/documents/2024-03/ucrf_proposal_fao_signed_redacted.pdf. (Accessed 2025-08-24)

¹⁹⁶ UCRF. "UKRAINE COMMUNITY RECOVERY FUND MPTF OFFICE GENERIC ANNUAL PROGRAMME1 NARRATIVE PROGRESS REPORT REPORTING PERIOD: 01 MARCH – 31 DECEMBER 2024". https://mptf.undp.org/sites/default/files/documents/2025-04/project_00140626_iom_crf_annual_report_2024.pdf. (Accessed 2025-08-24)

households, the projects actively promote women's economic empowerment through the introduction of labor-saving technologies and leadership training. Second, they strictly adhere to the principle of Accountability to Affected People (AAP). By establishing and operating a complaints and feedback mechanism throughout the entire project cycle, they strive to ensure transparency and trust by systematically incorporating beneficiaries' voices into project management.