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SUSTAINABLE FOOD SUPPLY IN SLOVENIA

Sustainable Food Supply in Slovenia

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LIST OF ABBREVIATIONS

AJPES	Agencija Republike Slovenije za javnopravne evidence in storitve [Agency of the Republic of Slovenia for Public Legal Records and Related Services.]
ANC	Area facing natural or other specific constraints
ARSKTRP	Agencija Republike Slovenije za kmetijske trge in razvoj podeželja [Agency of the Republic of Slovenia for Agricultural Markets and Rural Development]
ARSO	Agencija Republike Slovenije za okolje [Slovenian Environment Agency]
AWU	Annual working unit
CAP	Common Agricultural Policy
EU	European Union
GHG	Greenhouse gases
KIS	Kmetijski inštitut Slovenije [Agricultural Institute of Slovenia]
LSU	Livestock Size Unit
MF	Ministrstvo za finance [Ministry of Finance]
MKGP	Ministrstvo za kmetijstvo, gozdarstvo in prehrano [Ministry of Agriculture, Forestry and Food]
NECP	Celoviti nacionalni energetski in podnebni načrt Republike Slovenije [Integrated National Energy and Climate Plan of the Republic of Slovenia]
OECD	Organization for Economic Co-operation and Development
OSLIS	Osrednji Slovenski Lovsko Informacijski Sistem [Central Slovenian Hunting Information System]
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
SURS	Statistični urad Republike Slovenije [Statistical Office of the Republic of Slovenia]
TSG	Traditional Speciality Guaranteed
UAA	Utilized agricultural area
UVHVVR	Uprava za varno hrano, veterinarstvo in varstvo rastlin [Administration for Food Safety, the Veterinary Sector, and Plant Protection]
WPA	Water protection area
ZZRS	Zavod za ribištvo Slovenije [Fisheries Research Institute of Slovenia]

1 | INTRODUCTION

Food is a basic good and is essential for the survival of individuals and society. After decades of relative stability, food supply is once again becoming a strategically important issue in light of climate change and other geopolitical and global upheavals, with the concepts of food security and food sovereignty returning to the centre of European and national debates.

The recently established concept of "food supply chains" has been expanded to include issues such as sustainability, the environment, climate, and society, and has been upgraded to the concept of "sustainable food systems" with the inclusion of non-agricultural sectors. This concept addresses the fact that existing food systems face numerous challenges and are unsustainable in the long term, requiring transformation in order to achieve sustainability. As food systems are extremely complex, understanding the roles of all actors involved and their interrelationships is key to understanding them. The fundamental task of the food system and its primary sector (agriculture) remains to satisfy the basic human need for food. At the same time, sustainable food systems protect the environment and nature, provide higher quality and healthier food, and contribute to more effectively dealing with climate change and ensuring social well-being.

This publication aims to familiarize the wider Slovenian public with the concept of food systems as well as the factors, actors, and processes that influence food supply – including consumption, in which we all take part. Readers are presented with the current state of the food system in Slovenia as a starting point for transforming it into a more resilient and sustainable system that will continue to ensure food security in the future. The publication seeks to encourage readers to think and act in the direction of the necessary changes. It outlines some of the effects of food choices and practices, emphasizing the responsibility of all actors.

The central part of this publication is devoted to primary food production – agriculture – as well as other sectors (hunting and fishing) that supplement the food supply. It describes the state of Slovenian agriculture and its economic, social, and environmental impacts, highlighting the multifunctional role of agriculture: in addition to ensuring food supply and food security, agriculture supports the local economy, preserves the cultural landscape and natural resources, and contributes to the vitality and population of rural areas. In this way, the publication seeks to reinforce the importance of food of local Slovenian origin and to contribute to strengthening the reputation of Slovenian agriculture.

Due to the lack of relevant data, chapters on the processing, distribution, sales, and consumption of food and the state of food waste in Slovenia are included in this publication to a somewhat lesser extent. The publication concludes with some proposals for making the existing food system more sustainable in terms of key processes and actors.

The content of this publication is based on materials from international institutions, the applicable legislation, and selected Environmental Indicators in Slovenia, which are available on the ARSO website (https://kazalci.arso.gov.si/en). Official data, particularly statistical data, available as of mid-March 2025, also represent an important source of information.

2 FOOD SUPPLY AND FOOD SYSTEMS

Food (food and beverages) is not only a basic good that provides nutrients and energy for survival, but is also one of the focal points of our daily lives, culture, and social customs.

Foto © nasasuperhrana.si

2.1 FOOD SUPPLY – THE PATH OF FOOD FROM PRODUCTION TO CONSUMPTION

Reliable food supply[1] is fundamental to the well-being of individuals and the stability of society as a whole, with its main goal being food security – a state in which all people have constant access to sufficient quantities of safe, affordable, and nutritious food that meets their dietary needs and preferences, enabling them to maintain an active and healthy life (FAO, 1996).

The supply of food to the population takes place through the **food supply chain.** Such chains can be very short – for example, from garden to table – or long, complex, and globalized. They represent the central part of **food systems** (often, the term agri-food systems is also used), which is a more comprehensive concept of food supply, as such does not focus solely on the physical flow of food, but also includes the environmental, social, health, economic, political, and other dimensions of food (Parsons et al., 2019).

A food system can be defined as all the elements (the environment, people, production inputs, processes, infrastructure, institutions, etc.) and activities involved in the production, processing, distribution, preparation, and consumption of food, as well as the results arising from these activities. By their nature, food systems are multipurpose (they perform multiple functions), involve numerous actors, and are also closely linked to other systems, such as healthcare, mobility, and energy (EEA, 2025b).

The elements of a food system are interconnected in complex and dynamic networks. However, a food system can be simplified as a sequence of activities from primary production to food consumption (including the management of waste generated at all stages of the system), which represents the core of the system (Figure 1). **Production inputs**, such as natural and human resources (e.g. land, soil, water, minerals, energy, and labour), capital, knowledge, and services, are needed for the smooth implementation of all activities.

The activities of the food system are guided by various **influencing factors or driving forces**, which can originate from within or outside the system. Some of these driving forces include the climate, the environment, demographics, urbanization, political events and decisions, knowledge and technology, social values and trends, market and economic conditions, and many others (Lollar et al., 2007; Parsons et al., 2019).

Various **outcomes** arise from the activities of food systems. These are the effects and consequences of the system's operation for society, health, the economy, and the environment, and the outcomes can also be driving forces. The central outcomes of food systems are food production and ensuring food security. As a source of food, they contribute to the health and prevention of diseases of the population and have an important cultural significance (Food ..., 2023). Simultaneously, they provide income and a livelihood to farmers and many other involved actors and service providers, from suppliers of inputs to processors, distributors, as well as shops, food markets, and restaurants (OECD, 2021). From an environmental point of view, food systems shape landscapes, manage natural resources, and provide ecosystem services.

[1] Food or foodstuff is defined in this publication as any substance or product in unprocessed, partially processed, or processed form intended for human consumption, including water (Uredba..., 2002).

Figure 1: Simplified scheme of the food system with the key processes and actors

WASTE MANAGEMENT

Actors: municipal waste collectors, biodegredable waste collectors, composting facilities, and biogas plants

Food waste and other waste, such as packaging waste, are generated through the processes within the food system. Therefore, part of the food system also includes waste management, such as reuse, recycling, composting, and biogas production.

CONSUMPTION

Actors: households and various food preparation facilities

In addition to households, final food consumers also include food preparation facilities in the hospitality and tourism sectors, public institutions (such as pre-schools, schools, hospitals, etc.), facilities that prepare food for sale in retail stores, and other establishments.

PRODUCTION

Actors: primary food producers (agriculture, fisheries, hunting, and gathering)

Farms are the main food producers and provide the majority of the food supply. Fisheries also play an important role in food provision, whereas hunting and gathering are less significant.

PROCESSING AND PACKAGING

Actors: purchasers and processors

The majority of food enters the food supply chain through networks of purchasers and the food processing industry. The latter, through various stages of processing, preservation, and packaging, ensures longer shelf life, greater safety, and a wider variety of food products for the consumer.

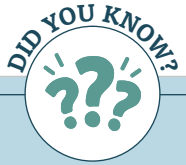
DISTRIBUTION AND SALES

Actors: distribution centres, transporters, traders

Distribution connects food producers and processors with final consumers. Distribution centres, through storage in controlled and, when necessary, refrigerated conditions, serve as hubs for the further transport and sale of food in both wholesale and retail markets.

Source: Scheme adapted from Lollar et al. (2007), What ... (2025); infographic – KIS

In the developed world today, after decades of relative food supply stability, food systems are faced with numerous environmental, economic, social, and geopolitical challenges (e.g. the global Covid-19 pandemic, the war in Ukraine), making the strategic issues of food supply and food security once again very important (Poročilo ..., 2023). Among the major challenges facing food systems are inequalities in the population regarding access to sufficient quantities of safe and healthy food, obesity and diet-related diseases, globalization pressures, urbanization, demographic changes, unfair practices, inequalities and imbalances of power among individual links in the food supply chain. The operation of food systems (especially primary food production) is strongly dependent on the environment and natural resources. At the same time, they also create significant pressures on the environment – contributing to greenhouse gas emissions, the deterioration of soil and water quality, deforestation, and the loss of biodiversity, and are a major consumer of energy and water. Large quantities of food waste and other waste are also generated through food systems (FAO, 2018b; FAO, 2024; Food ..., 2023; OECD, 2021). It is also necessary to mention the competition for limited natural and human resources from other sectors, such as energy, industry, and tourism. The demand for land and agricultural raw materials for non-agricultural purposes continues to increase, creating additional pressures on food systems.



In addition to the concept of food security, the concept of **food sovereignty** also often arises. This is a comprehensive concept based on human rights (the right to food, a healthy environment, and a dignified life). It opposes industrial-style (agricultural) food systems and supports food systems that simultaneously take into account human well-being and the health of the planet, with an emphasis on sustainable agricultural practices (Wittman, 2023).

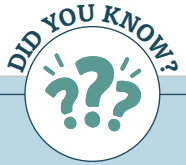
The vulnerability of food systems increases in situations of geopolitical unrest, natural disasters, pandemics, economic crises, and other shocks (Food ..., 2023). These can weaken the functioning of food systems with reduced resilience and jeopardize the supply of food to people. Global crises and disruptions in recent times have particularly highlighted the great vulnerability of food systems and the numerous negative effects, including environmental ones, that free international trade environments can have on small markets such as Slovenia. At the same time, awareness has increased regarding the importance of food security and sovereignty, as well as the importance of producing and consuming domestic (local) food.

The challenges facing food systems require a **transformation towards sustainable development**. This will reduce the negative and increase the positive impacts of these systems on society, the environment, the climate, and the economy, and ensure a more reliable supply of safe and quality food for future generations.

2.2 A SUSTAINABLE FOOD SYSTEM: ECONOMICALLY VIABLE, RESILIENT, ENVIRONMENTALLY FRIENDLY, AND FAIR

Sustainable development is defined as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." It is based on an approach that seeks balance between three interconnected elements crucial for the well-being of individuals and societies: economic growth, social inclusion, and environmental protection (UN, 2025a). Sustainability is therefore defined by three pillars or dimensions: economic, environmental, and social.

The sustainable transformation of food systems requires a comprehensive approach, considering all actors and processes involved, and all three dimensions of sustainability. It represents a shift from traditional, narrowly focused sectoral concepts, such as the production concept focused on increasing production to ensure food security (without considering the protection of natural resources) and the concept of maintaining the income levels of individual groups.



Ecological footprint is a well-established, highly synthetic indicator of sustainable development that illustrates "the pressures of socio-economic development on the environment and human intervention in the biosphere" (Indicator SE08) and through which the effectiveness of food systems can also be indirectly monitored.

At the European level, the **European Green Deal**[2] represents a set of policy initiatives aimed at achieving climate neutrality for the European Union (EU) by 2050 by reshaping the way we produce and consume. This goal also includes other strategies, such as the Biodiversity Strategy for 2030 and the **"Farm to Fork" strategy**[3], which the European Commission presented in 2020 as one of the key pillars within the Green Deal. Its purpose is to make the EU food system more sustainable, i.e. such that it is fair, healthy, environmentally friendly, and resilient and such that the goals and measures included within it address the main challenges of food systems in the EU. In February 2025, a new European **Vision for Agriculture and Food**[4] was published, with four key priorities: increasing the attractiveness of the agricultural sector (especially for young people), ensuring the competitiveness and resilience of the agri-food sector (i.e. food security and sovereignty), balancing all this with climate change and environmental goals, and ensuring fair living and working conditions in rural areas.

[2] https://www.consilium.europa.eu/sl/policies/green-deal/ (26. 2. 2025)

[3] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en (14. 2. 2025)

[4] https://ec.europa.eu/commission/presscorner/api/files/document/print/en/ip_25_530/IP_25_530_EN.pdf; https://ec.europa.eu/commission/presscorner/detail/en/ip_25_530 (19. 2. 2025)

Slovenian strategic documents are also increasingly recognizing the importance of the sustainable development of food systems. The overarching guideline of the **Common Agricultural Policy Strategic Plan 2023–2027 for Slovenia**[5] is "to ensure sustainable food production throughout the country and increase self-sufficiency," thereby addressing the challenges of food security and environmental-climate challenges. The **Resolution** "**Our Food, Rural Areas, and Natural Resources after 2021**"[6] also addresses all three key dimensions of sustainable development. In 2025, work began on preparing the new **"Our Agriculture and Food in 2040" Vision** ("**Vizija 2040")**, the goal of which is to shape "a national strategic framework for the development of the entire agri-food system in Slovenia, which will enable coordinated guidance of policies and a long-term perspective for farms and the entire food supply chain"[7]. This vision will define goals and solutions for strengthening sustainability, resilience, and food sovereignty. The proposed solutions will attempt to balance economic, environmental-climate, and social aspects of sustainable food production and consumption. The vision is expected to be completed by the end of 2025.

A comprehensive and systemic approach to sustainable food supply is therefore emerging in Slovenia at the time of the preparation of this publication, both in public debate, where some possible multidisciplinary or cross-sectoral solutions have already been indicated (Presidential Forum "Food Sovereignty," November 2023), and in the shaping of policies. A systemic way of thinking, which includes a comprehensive view of the challenges of the food system, enables the coordination of the activities of key actors, reduces the impact of external driving forces, and ensures that the individual parts of the system follow common goals. This approach allows for the development of better solutions rather than only focusing on individual parts or actors in the system. Due to the natural characteristics, specificities, and challenges of Slovenian agriculture, this approach is more appropriate than directly implementing approaches from other EU Member States.

In the area of the **environmental sustainability of agriculture**, Slovenia is already focusing on ensuring the sustainable use of natural resources, biodiversity, habitats, and the characteristics of the Slovenian landscape, as well as goals related to strengthening ecosystem services. In both agriculture and other sectors, climate actions that pursue the long-term goals of emissions reduction are being implemented, as defined in the Long-Term Climate Strategy[8], and the short-term goals in the Integrated National Energy and Climate Plan of the Republic of Slovenia (NECP)[9].

The food processing industry is also responding to environmental and food challenges. In addition to seeking ideas and technological solutions to increase the proportion of recycled packaging, it is rapidly investing in the technological renovation of production processes and in infrastructure and equipment with a lower negative impact on the environment. By optimizing production processes, the food processing industry significantly

[5] https://skp.si/skupna-kmetijska-politika-2023-2027 (10. 10. 2025)

[6] https://pisrs.si/pregledPredpisa?id=RESO125 (10. 10. 2025)

[7] https://www.gov.si/zbirke/projekti-in-programi/vizija-za-prihodnost-evropskega-kmetijstva/ (11. 3. 2025)

[8] https://pisrs.si/pregledPredpisa?id=RESO131 (24. 9. 2025)

[9] https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/nepn/dokumenti/nepn2024_final_dec2024.pdf (24. 9. 2025)

reduces the waste generated during food processing. The Ministry of Agriculture, together with agricultural, food, and other non-governmental organizations, carries out numerous training programmes on the sustainable consumption of food of local origin, on the establishment of appropriate storage capacities, and on actions to reduce food waste, as well as activities in the field of promoting diverse local food.

Slovenian science is also participating in the transformation of the food system in Slovenia. In addition to seeking sustainable solutions in the field of agriculture and food, it also studies solutions in the direction of "local alternative food networks," such as sustainable logistics solutions and the handling of food and its reuse. **Innovations**, especially social innovations, also play an important role in the sustainable transformation of food systems, which is emphasized by an increasing number of studies (e.g. IPES-Food, 2019; European ..., 2020). This includes networking, competitions, various forms of funding, "ecosystems," the collection and dissemination of the impacts and benefits of innovation, incubators, and research[10]. In food systems, social innovations are becoming established, especially those linked to shorter food supply chains, community-supported agriculture, urban farming, public procurement schemes, solutions for reducing food waste, food education, and community-building initiatives. Such initiatives can contribute to reducing impacts on the environment and climate, help small producers and food companies achieve fair value for their products, and contribute to building better relationships between producers, consumers, and policymakers (IPES-Food, 2019). More in-depth consideration of **adapting consumer habits** (including the consumption of non-food goods and services) will also be necessary within the framework of the aforementioned vision (Vizija 2040).

Ideally, the food system will be sustainable when it is an integrated and cohesive system of food production, processing, distribution, consumption, and waste management, which simultaneously ensures the economic, environmental-climate, and social aspects of sustainability in order to ensure food security and sovereignty for current and future generations (Predlog ..., 2025).

[10] https://single-market-economy.ec.europa.eu/industry/strategy/innovation/social_en (6. 3. 2025)

3 FOOD PRODUCTION

The primary food producers are farms, which supply the largest share of the population with plant and animal products. Fisheries are also important for food supply in Slovenia, while hunting and gathering play a lesser role.

Foto © KIS archive

3 . 1 AGRICULTURE IS A FUNDAMENTAL BUILDING BLOCK OF THE FOOD SYSTEM

Agriculture is a key strategic economic sector that provides a food supply to the population. In addition to food production, agriculture is attributed many other functions, such as supporting the local economy, contributing to the vitality and settlement of rural areas, and providing ecosystem services while respecting the principles of good agricultural practice (e.g. conserving biodiversity, ensuring water quality, increasing carbon stocks in soils, and preventing erosion, floods, and fires). Recently, there has been an increasing emphasis on **sustainable agriculture**, which considers the environmental and social aspects of development in addition to economic ones and is an important part of sustainable food systems (Podnebno..., 2025).

Slovenia ranks third amongst EU Member States in terms of **forest cover as a percentage of the total land area**. Only Sweden and Finland have a higher percentage of forest cover (Indicator GZ04).

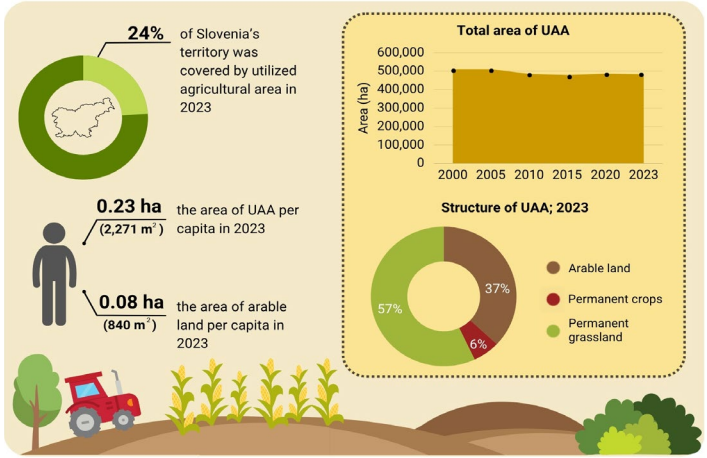
3.1.1. Agricultural land is the foundation of food production

Together with other natural resources such as solar energy, water, air, and genetic resources, agricultural land is the foundation of food production. It enables the production of plants and the raising of animals, and ensuring that its extent is sufficient is important for the food supply and food security of the population.

In Slovenia, the natural conditions for agriculture are less favourable, as the relief, mountainous terrain, and large proportion of karst areas limit the area of land suitable for agricultural cultivation (Cunder, 2002). Forest cover accounts for the largest share of the country, at 59%. In 2023, agricultural land covered slightly more than half that amount, totalling around 670,000 hectares, or 33% (Zeleno..., 2024).

The total area of agricultural land represents the potential for food production, which is not fully utilized. Thus, total agricultural land also includes unutilized agricultural land. This includes abandoned agricultural land, land with trees and shrubs (hedges, groups of trees and shrubs, and riparian overgrowth), plantations of forest trees, and uncultivated land. Agricultural land that farms actually cultivate and that contributes to food production is **utilized agricultural area (UAA)**. This includes arable land, permanent grassland, and permanent crops. The area of such type of land has decreased slightly in the last two decades, and in 2023 covered 481,000 hectares or 24% of the area of Slovenia (Figure 2).

Figure 2: Area (2000–2023) and structure (2023) of UAA in Slovenia



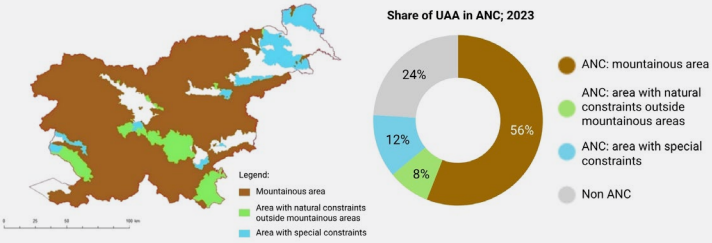
Source: SURS data (Crop production statistics); infographic – KIS

As a consequence of the natural conditions and traditional agricultural practices, **permanent grassland dominates** the structure of UAA at 57%, while arable land covers 37% and permanent crops 6%. **Farms cultivate an average of 0.23 hectares of UAA per capita,** of which only slightly more than 0.08 hectares are arable land, which places Slovenia among the countries with the smallest area of arable land per capita within the EU (the EU average in 2022 was 0.22 hectares per capita) (Indicator KM27).

Areas facing natural or other specific constraints

In Slovenia, three-quarters of utilized agricultural area is located in areas facing natural or other specific constraints (ANC). These are divided into mountainous areas, areas with natural constraints outside mountainous areas, and areas with special constraints (Figure 3).

Figure 3: The spatial distribution of ANC and the share of total UAA in ANC; 2023



Source: MKGP

The conditions for agricultural activity are more difficult in these areas due to various natural factors, such as altitude, steep slopes, low temperature, the chemical properties of the soil, and excessive moisture. Consequently, production costs are higher and productivity is lower, increasing the risk of production being abandoned. More than half of utilized agricultural area (56%) is located in mountainous areas, where the more difficult growing conditions are a result of higher altitudes and associated shorter growing seasons. In mountainous areas with lower altitudes, farming is limited mainly by steep slopes.

MYTHS & TRUTHS

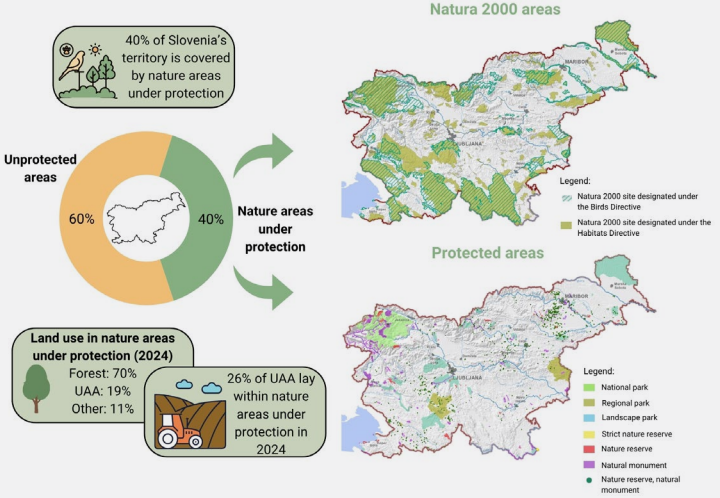
MYTH: **Slovenia has enough arable land to ensure adequate food security.**

Unfortunately, this is not true. It is very worrying that Slovenia has little arable land for local food production. In order to ensure adequate food security, the country needs approximately 2,500 m² of arable land per capita, which is three times more than the current area of arable land per capita, i.e. 840 m² (Indicator KM10).

Nature areas under protection and water protection areas

Part of the agricultural land in Slovenia is located in areas subject to various legally prescribed restrictions designed to protect nature and water. These include nature areas under protection, which are divided into **protected areas** (parks, nature reserves, natural monuments) and **areas of the Natura 2000 network**, which together cover 40% of the area of Slovenia (Figure 4) (Indicator NV01). A significant proportion of all utilized agricultural area is located within nature areas under protection, with 26% under various forms of protection (Indicator KM06).

Figure 4: Nature areas under protection in Slovenia; 2021



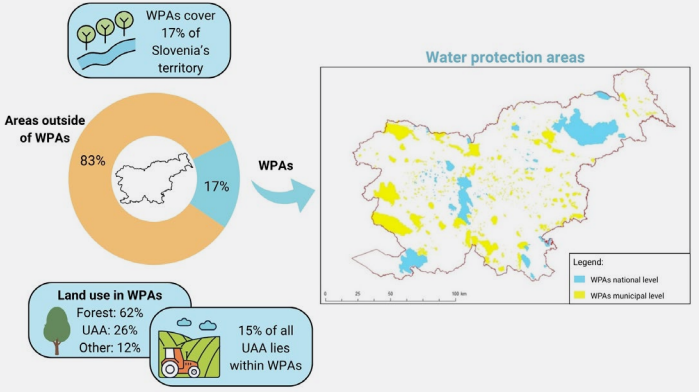
Source: Data – ARSO (Indicator NV01, Indicator KM06); maps – ARSO (Indicator NV02, Indicator NV03); infographic – KIS

Agriculture plays an important role in preserving biodiversity through its activities in nature areas under protection. Regular mowing of extensive meadows, for example, prevents overgrowth and allows for the existence of diverse meadow communities that have historically formed on these habitats through agricultural use (Indicator KM06). Therefore, maintaining agriculture in these areas is important for preserving many freely living species and their habitats.

Water protection areas (WPAs) are areas where the protection of water bodies intended for drinking water abstraction is implemented. Various protection regimes apply in such areas, resulting in certain prohibitions or restrictions on construction, agriculture, and other activities (Indicator VD16).

The total area of WPAs in 2023 represented 17% of Slovenia's total area (Figure 5). Similar to protected natural areas, forest covers the predominant share (62%) of the land use structure in WPAs, while utilized agricultural area covers 26% (of which, grassland 13%, arable land 11%, and permanent crops 2%; Indicator TP06). Within WPAs, 9,000 hectares are areas under the strictest water protection regime (WPA I), which are located near abstractions. In these areas, the use of mineral fertilizers, manure, and plant protection products is prohibited or restricted due to the risk of drinking water contamination (Indicator VD16).

Figure 5: Water protection areas in Slovenia; 2023



Source: Data – ARSO (Indicator TP06); map – MKGP; infographic - KIS

Protection of agricultural land

Slovenia has a very limited amount of agricultural land, which is a non-renewable natural resource. From the point of view of food security, preserving the characteristic cultural landscape, and other functions of agricultural land, its protection from permanent change or deterioration in quality and ensuring its cultivability is therefore extremely important.

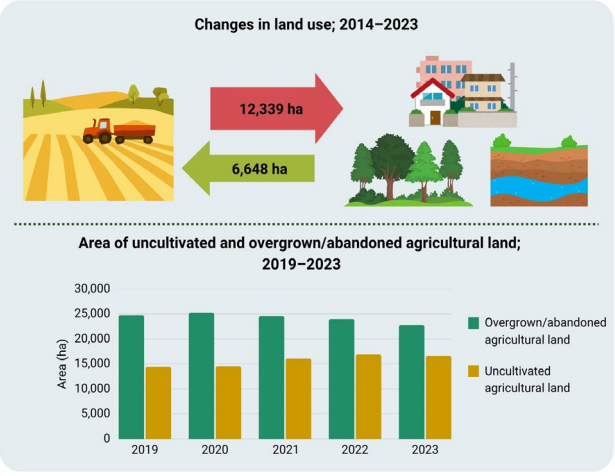
Agricultural land is most threatened by **urbanization**, which is the process of expanding settlements, commercial and industrial centres, and infrastructure onto land with agricultural or forestry use. Especially due to construction, the soil becomes mostly irreversibly degraded and permanently loses the functions necessary for food production and ecosystem services (Indicator KM10). Agricultural land is also lost through **overgrowth/abandonment** or conversion to forest land. Overgrowth does not lead to irreversible soil degradation and can be seen as a positive process from an environmental point of view, but from a food security point of view, given the small amount of cultivated land per capita, it means greater food dependence.

The cultivability of agricultural land in Slovenia is decreasing, while the built-up area is increasing, especially on land with better soil quality. The urbanization process is taking place primarily on the periphery of settlements and along the routes of major infrastructure facilities (Indicator KM10). The main reason for the overgrowth of agricultural land is the abandonment of agricultural activity, especially in areas with difficult growing conditions and due to the unfavourable age structure of farmers, which can also be a consequence of unattractive conditions for young people as regards taking up farming. In 2023, overgrown agricultural land covered just under 23,000 hectares. This land represents potential for re-establishing agricultural production, and the state supports the removal of overgrowth through finan-

cial measures. An additional 17,000 hectares were uncultivated agricultural land. This includes land that is only temporarily out of use, land with fencing for animals, and land where cultivation is actually being abandoned (Zeleno ..., 2024). This land is often a transitional category before a change in land use to built-up area, which means a loss of agricultural function (Indicator TP03).

Changes in land use are two-way, but changes from non-agricultural uses (building, forest, water, and other land) to agricultural use are less extensive. In the last decade (2014–2023), approximately 12,300 hectares of agricultural land were lost due to changes in use, while only half of this amount, or around 6,600 hectares, was returned to agricultural use (Figure 6).

Figure 6: Changes in land use (2014–2023) and area of uncultivated agricultural land and abandoned agricultural land (2019–2023)



Source: Data – MKGP, MOP; infographic – KIS

MYTHS & TRUTHS

MYTH: **Agricultural land is only important for food production.**

This is not true. In addition to its basic function of food production, agricultural land also provides a number of important ecosystem services, such as water filtration, pollutant degradation, carbon dioxide sequestration, nutrient cycling, and others (Indicator KM10). These ecosystem services are beneficial to the environment as well as to society and the economy. In addition, agricultural land creates a distinctive landscape and increases its attractiveness for tourism and recreation.

MYTH: **Agricultural land reduces biodiversity in the natural environment.**

This is not entirely true. Intensive and inappropriate use of agricultural land contributes to the loss of biodiversity. However, agricultural land that is cultivated in an environmentally friendly manner supports biodiversity by providing a habitat for many species.

In Slovenia, agriculture has played a major role in the creation of semi-natural habitats (e.g. dry karst grasslands) that are important in terms of biodiversity. With the continuation of farming and the prevention of overgrowth in these areas, the existence of these habitats is also preserved (Indicator KM06). Today, Slovenia boasts a highly diverse landscape and a high level of biodiversity, with 15% of its agricultural land classified as having high natural value, placing it among the top EU Member States (Indicator KM05).

3.1.2 Slovenian agriculture relies on family farms

Number and size of farms

The total number of farms in Slovenia is gradually decreasing. Between 2000 and 2020, the number of farms decreased by 18,136, or 21% (Figure 7). Simultaneously, the average size of farms increased from 5.6 to 7.0 hectares of UAA, as the total area of land farmed did not significantly decrease.

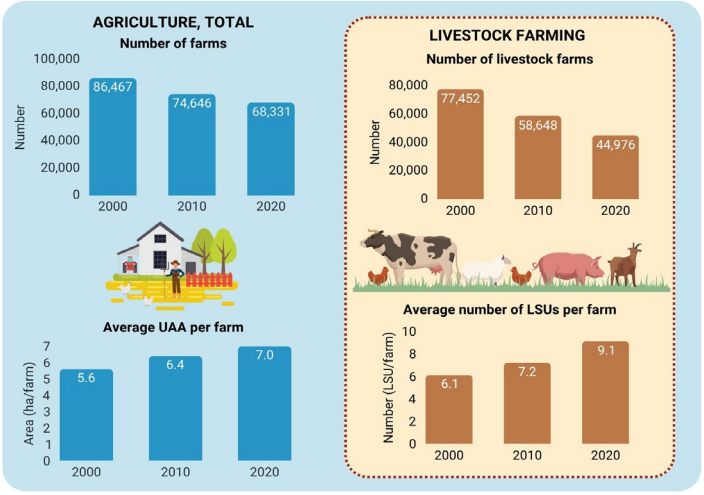
Livestock farming is also experiencing a strong negative trend of declining farm numbers. The number of all livestock farms almost halved between 2000 and 2020. During the same period, the average number of animals per farm increased from 6.1 livestock units (LSU) to 9.1 LSU.

DID YOU KNOW?

2023 farm census

The latest sample farm census was conducted in 2023. According to the provisional census data, there were 50,531 farms in Slovenia in 2023, which cultivated an average of 8.9 hectares of land. The data from this census are not directly comparable with the series of data for the period 2000–2020 due to different coverage thresholds. However, the data for 2020 converted to a comparable level show that between 2020 and 2023 the number of farms decreased by 7%, while the average size of farms increased from 8.1 to 8.9 hectares.

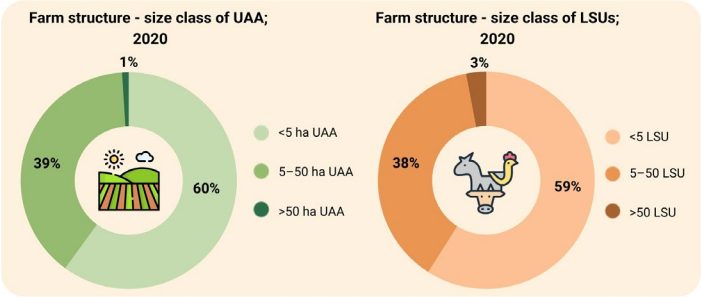
Figure 7: Number and average size (UAA, LSU) of farms in Slovenia; 2000–2020



Source: Data – SURS; infographic – KIS

Significant structural changes are taking place in Slovenian agriculture. A process entailing **the concentration of agricultural production** is noticeable, as smaller farms are disappearing and larger ones are taking over their land. Increasingly, more farms are cultivating over 50 hectares of utilized agricultural area (UAA) or raising more than 50 LSU, while the number of farms in smaller size classes is decreasing (Indicator KM34). However, the size structure of farms remains quite unfavourable in terms of their competitiveness. In 2020, farms cultivating less than 5 hectares of UAA accounted for 60% of the total, and livestock farms raising less than five LSU accounted for 59% (Figure 8). In addition to the unfavourable size structure, farms are also characterized by high fragmentation of land, which reduces productivity.

Figure 8: The structure of farms by size classes of UAA and LSU in Slovenia; 2020



Source: Data – SURS; infographic – KIS

A comparison of structural data shows that Slovenian farms are still significantly behind the EU average in terms of size, and their competitiveness is low compared to European farms (Indicator KM34). In the 27 EU Member States, over 9 million farms were involved in agriculture in 2020, cultivating a total of 155 million hectares of UAA, with an average size of 17 hectares of UAA. Slovenia therefore represents less than 1% of farms in European terms, and with seven hectares of UAA per farm on average, it outperforms only Malta, Cyprus, Romania, and Greece. The largest farms are in the Czech Republic, where an average of 121 hectares of UAA are cultivated. Slovenia also belongs to the bottom group of EU countries in terms of average number of animals per farm, alongside Romania, Croatia, and Lithuania. The EU average in 2020 was 27 LSU per farm, which is almost three times more than in Slovenia (Zeleno ..., 2024).

DID YOU KNOW?

Between 2000 and 2020, Slovenia lost an average of 2.5 farms per day. Some of the main reasons for abandoning farming are the unfavourable age structure of farmers, the lack of young successors, partly due to the unattractive conditions for continuing the activity, the poor economic situation of farms and the lack of competitiveness of agriculture (also due to market fragmentation), the fragmentation of land, and the difficult production conditions.

The loss of farms, especially smaller ones, has broader consequences for the economy, society, and the environment due to the multifunctional role of agriculture, which goes beyond mere food production. Agriculture also plays a role in preserving the environment and biodiversity, shaping the cultural landscape, ensuring the vitality and population of rural areas, and providing employment for the population.

In Slovenia, the concentration of agricultural production due to the increase in the size of cultivated areas per farm is not generally a negative process. The positive effects of farm growth include improved productivity and competitiveness, higher yields per hectare, and production, which is the result of better conditions, equipment, knowledge, and better investment opportunities. Concentration only acquires a negative connotation when the increase in the size of farms leads to such an increase in agricultural production that it puts increased pressure on the environment. Therefore, the indicator of agricultural production concentration must be monitored in conjunction with other indicators, such as livestock density on agricultural land and the use of production inputs (e.g. fertilizers, plant protection products).

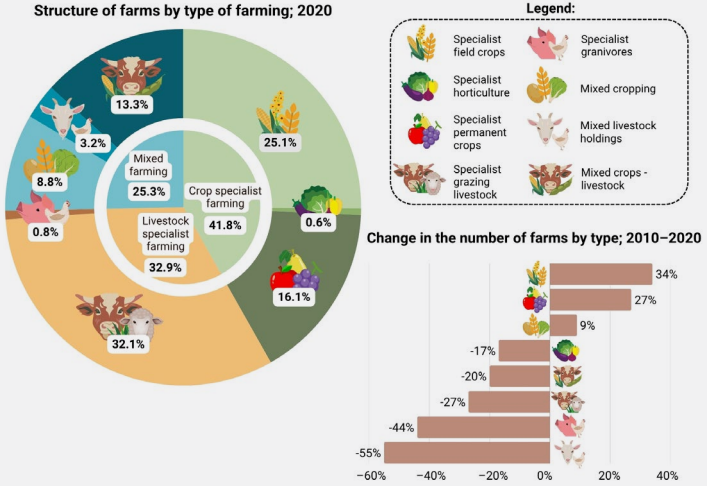
The typology and economic size of farms

Alongside structural changes, specialization processes are also taking place in Slovenia, meaning that farms are focusing on a specific agricultural sector, such as crop production. With increasing concentration and specialization of production, the technological equipment and production efficiency of farms are improving (Indicator KM12).

The degree of specialization in agriculture in Slovenia is relatively low compared to other EU countries. In 2020, three-quarters of farms were specialized in a certain type of crop or livestock production, with just under 29,000, or 42%, specializing in crop production, and around 22,000, or 33%, specializing in livestock production (Figure 9). Within specialized crop production, farms that specialize in field crops and farms with permanent crops prevailed, while among specialized livestock farms, those that specialize in grazing livestock were dominant, which also represented the largest share of all farms combined (32%). A quarter of all farms were mixed, encompassing mixed crop production, mixed livestock farming, or a combination of both (Indicator KM12). Between 2010 and 2020, the number of farms in all specialized and mixed livestock types decreased, most notably in mixed livestock farming, where the number of farms more than halved. The number of farms specialized in crop production increased, with the exception of horticulture, while the largest increase was recorded in field crop production (34%).

In 2020, Slovenian farms achieved a **total standard output** (gross production value without subsidies) of EUR 1.15 billion, which is 25% more than in 2010. The largest share, 41%, was contributed by farms raising grazing livestock, while all specialized farms combined accounted for 80% (Indicator KM12).

Figure 9: The structure of farms (2020) and changes in the number of farms (2010–2020) in Slovenia by main type of farming

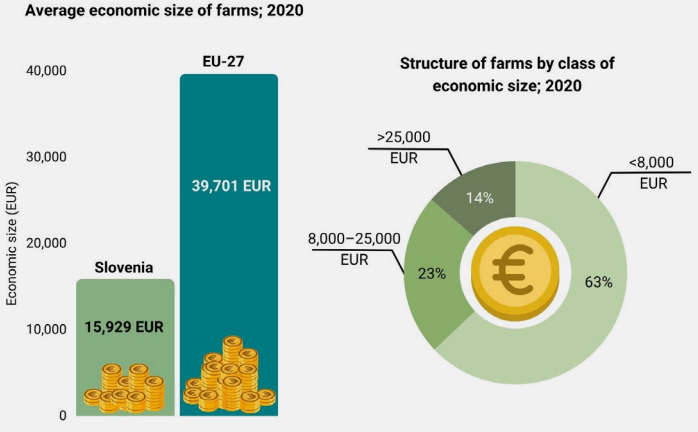


Source: Data – SURS; infographic – KIS

In European terms, Slovenian farms rank among the smaller ones regarding economic size, achieving standard output that is less than half the EU average. The average standard output per farm was almost EUR 40,000 in EU countries in 2020, while in Slovenia it was EUR 16,000, with almost two-thirds of farms having a standard output below EUR 8,000 (Figure 10). Farms in Greece, Croatia, Malta, and Romania have a lower standard output on average, while farms in the Netherlands achieve the highest income from agriculture (EUR 473,000)

(Indicator KM12; Zeleno..., 2024). **The factor income**, calculated per annual working unit (AWU), which is one of the key indicators of the economic performance and productivity of agriculture, also shows a lag in incomes in Slovenian agriculture compared to the European average; in recent years it has averaged around EUR 7,300/AWU, or around 30% of the European average (SURS, Eurostat, calculations by KIS).

Figure 10: Average economic size of farms in Slovenia and the EU, and the structure of farms by class of economic size; 2020



Source: Data – Eurostat, SURS; infographic – KIS

MYTHS & TRUTHS

MYTH: **Specialization in agricultural production leads to increased pressure on the environment.**

This is not true in all cases. The orientation of farms towards specialized extensive production, for example extensive cattle and sheep farming in mountainous and other areas with natural constraints, can contribute to the preservation of agricultural land with high natural value (Indicator KM12).

MYTH: **Slovenian agriculture is characterized by high intensity.**

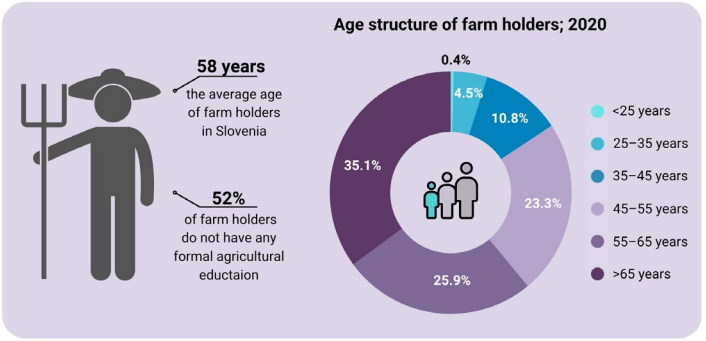
This is not true. In general, Slovenia has few areas suitable for intensive agriculture, and numerous indicators show that the intensity of agriculture is not increasing but decreasing. The use of plant protection products (Indicator KM01) and mineral fertilizers (Indicator KM02) and the number of animals per hectare of agricultural land (Indicator KM04) are decreasing, while the nitrogen and phosphorus balances on agricultural land are improving (Indicators KM22 and KM25). If we compare Slovenia with other EU countries, a larger proportion of land in Slovenia is cultivated by farms with lower input use (Indicator KM11).

The labour force in agriculture

Family farms are the predominant form of agricultural holding, with agricultural enterprises accounting for less than 1% of the total number. In 2020, family labour accounted for over 95% of the total amount. The total labour input in agriculture comprised 66,326 annual working units (1 AWU = 1,800 hours/year), averaging 0.97 AWU per farm (Zeleno ..., 2023). From the perspective of agricultural production, the share of specialized farms in Slovenia is slowly increasing, while **mixed farms** dominate in terms of income sources. These are farms that combine income from basic agricultural activities with income from outside agriculture, such as supplementary activities related to agriculture, income from employment, and other activities on the farm.

The age and educational level of farm holders-managers (hereinafter: farm holders) are factors that significantly contribute to the effective management of farms and their future development (Indicator KM07). Younger farm holders are more promising from a developmental perspective than older ones, have a higher average level of education, are more innovative, and are more adaptable to changes (Kneževič Hočevar and Černič Istenič, 2010). **In Slovenia, the age structure of farm holders is unfavourable**, as those over 55 years of age predominate (Figure 11). In 2020, as many as 61% of farm holders were over 55 years old, while only 5% were under 35 years old. The average age was 58 years.

Figure 11: The age and education of farm holders in Slovenia; 2020



Source: Data – ARSO (Indicator KM07), SURS; infographic – KIS

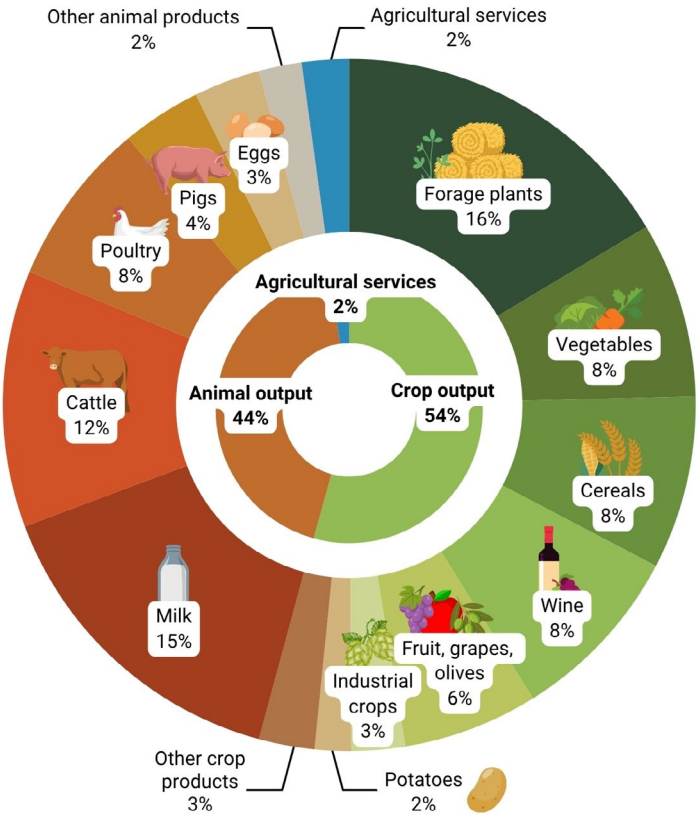
The educational structure of farm holders is also unfavourable, but it is improving, unlike the age structure. In 2000, as many as 86% of holders did not have formal agricultural education, but only practical experience in working in agriculture. By 2020, this share had decreased to 52%. The share of farm holders who had completed at least one form of formal agricultural education (basic or complete) was higher than the EU average (28%), but lower than countries such as the Netherlands (82%), Germany (67%), and France (65%) (Indicator KM07).

3.1.3 Agricultural production in Slovenia is predominantly oriented towards livestock farming

In the structure of agricultural production, crop production and livestock farming each contribute approximately half of the gross value. On average for the period 2019–2023, crop production contributed a slightly larger share, at 54%, while livestock farming contributed 44% (Figure 12). Agricultural services also contribute to the total value of agricultural production, accounting for an average of 2%.

Given the natural conditions for agriculture and soil fertility, **the most economically important livestock activities are milk and beef production**, which together contribute 63% of the value of livestock farming and 27% of total agricultural production. Particularly in connection with these sectors, the production of fodder crops represents the largest share within crop production (30%), as well as within total agricultural production (16%).

Figure 12: Structure of the value of agricultural production (current prices); average 2019–2023



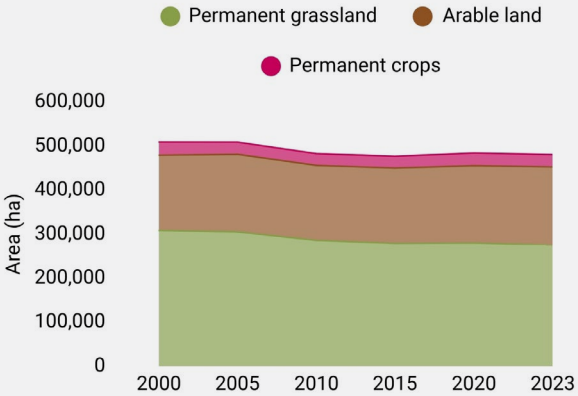
Source: Data – SURS; infographic – KIS

Crop production

The structure of crop production in Slovenia is closely linked to the natural conditions, and most utilized agricultural area is intended for the production of fodder on permanent grassland (Figure 14). In 2023, according to SURS data, fodder production took place on 275,000 hectares of meadows and pastures (Figure 13), which is 57% of all UAA, with around 58,000 farms engaged in fodder production.

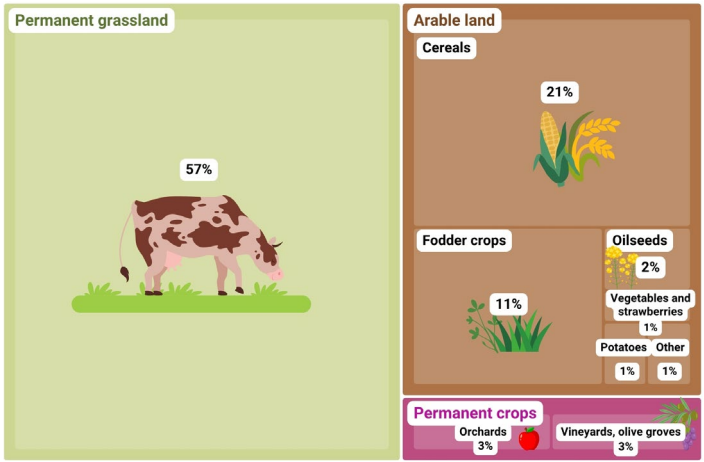
Despite the important role of arable farming in Slovenian agriculture, **arable land** covers only 37% of utilized agricultural area, as a consequence of the natural conditions. Larger contiguous flat areas suitable for arable farming are mostly located in the northeast of the country and at the bottom of basins, while elsewhere arable land is limited to small areas (Cunder, 2002).

Figure 13: Utilized agricultural area by category of use; 2000–2023



Source: SURS

Figure 14: Structure of crop production in Slovenia by area of UAA; 2023



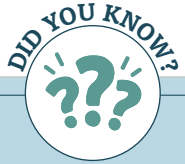
Source: Data – SURS; infographic – KIS

Arable farming is primarily focused on the production of cereals and fodder crops. **Cereals** are grown on approximately 100,000 hectares, representing over half of the arable land and one fifth of all cultivated land. According to the 2020 census, 29,068 farms were involved in cereal production, with an average area of 3.4 hectares per farm. Grain maize (42% of all cereals in 2023; Indicator KM11) predominates in cereal production, largely used as animal feed, followed by wheat and barley (Zeleno ..., 2024).

Nearly one-third of the arable land (55,000 hectares) is dedicated to the production of **fodder crops**, such as silage maize, grass, clover, alfalfa, and fodder roots. In 2020, 36,206 farms grew fodder crops on arable land, a similar number of farms were also involved in the production of **vegetables and strawberries**. The area dedicated to vegetables and strawberries has fluctuated

between four and six thousand hectares in recent years, representing 1% of the total UAA. Most of the area is dedicated to the production of lettuce, cabbage, and onions, with the majority of vegetables grown in the open, as only around 100 hectares of area are located in protected spaces (greenhouses). Important crops on the arable land in Slovenia also include **oilseeds** and **potatoes**. Oilseeds are grown on almost 10,000 hectares, or 2% of the total UAA in the country. Before 2015, rapeseed and pumpkins for oil were the most important oilseed crops, but the areas with soybeans have been increasing. In 2023, these three oilseed crops were grown in approximately equal proportions, while sunflower was less represented. The area with potatoes has decreased by more than half in recent decades and has stabilized at around 3,000 hectares, or 1% of the total UAA (Zeleno ..., 2024).

The smallest share of UAA categories is represented by **permanent crops** at 6%, which includes orchards, vineyards, olive groves, and tree and vine nurseries. Orchards covered around 12,000 hectares (3% UAA) in 2023, with approximately one-third being intensive orchards, while the rest were extensive (meadow) orchards. The area of apple orchards, the most important fruit species in Slovenia, has been decreasing in the long term, as have the areas of other important fruit species (pear, peach, nectarine, and cherry). Conversely, the areas of other fruit species are increasing, especially walnut, which has become the second most important fruit species in terms of area. The area of other permanent crops, namely vineyards, olive groves, and tree and vine nurseries covered 16,000 hectares, or 3% of the cultivated land in 2023 (Zeleno ..., 2024).



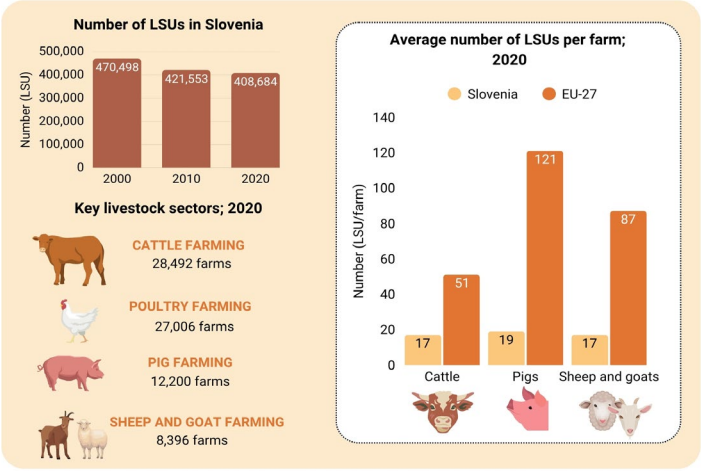
Before joining the EU, sugar beet was an important crop in Slovenian fields. With the introduction of sugar quotas in 2006 and the closure of the only sugar factory in Slovenia, sugar beet production was abandoned. Since 2017, sugar beet has been grown again on a smaller scale, and the harvest is exported abroad for processing.

Livestock farming

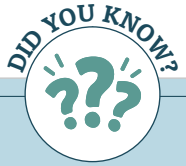
Livestock farming is the primary agricultural activity in Slovenia, primarily due to the large extent of areas with permanent grassland. According to data on the share of livestock farms, Slovenia was above the EU average in 2020 (Slovenia: 64%, EU average: 47%), however, livestock farms are on average much smaller (Slovenia: 9.7 LSU per farm, EU average: 26.9 LSU per farm) (Zeleno ..., 2024).

As with the number of livestock farms, which decreased by almost half between 2000 and 2020, a decreasing trend regarding the total number of breeding animals (in terms of LSU) is observed, which decreased by 13% in the same period (Figure 15). Today, the most important activities in livestock farming are cattle breeding, poultry farming, and pig farming, while small ruminants and other animals such as horses, rabbits, and deer are less represented. In 2020, 63% of the total of 44,976 livestock farms were involved in cattle breeding, 60% in poultry breeding, 27% in pig breeding, and 19% in sheep and goat breeding (Zeleno ..., 2023).

Figure 15: Total number of LSUs (2000–2020), average number of LSUs per farm and key livestock sectors in Slovenia (2020)



Source: Data – Eurostat, SURS; infographic – KIS



Livestock density (the number of animals per unit of utilized agricultural area) is a measure of the pressure on agricultural land in terms of grazing, livestock manure production, and impacts on soil and natural vegetation. Appropriate livestock density is key to sustainable land management as it reduces pressure on the environment. **In Slovenia, the livestock density of agricultural land is decreasing.** In the period 2000–2020, it decreased from 0.97 LSU/ha of UAA to 0.86 LSU/ha of UAA (Indicator KM04). However, the maximum livestock density is determined on the basis of the maximum annual nitrogen input from livestock manure into the soil in accordance with the Decree on the protection of waters against pollution caused by nitrates from agricultural sources (Uredba..., 2009). For cattle, the maximum permitted livestock density is 2.4 LSU/ha.

Cattle farming remains by far the most important sector of Slovenian agriculture. Milk and beef production are stable agricultural activities, together contributing a 27% share to the value of agricultural production. In 2020, 28,492 farms were involved in cattle farming, representing 42% of all farms in the country. Farms averaged 17 cattle, which is three times less than the EU average of 51 head. Smaller cattle farms in the EU can only be found in Romania, where farms average five cattle (Zeleno ..., 2023; 2024).

Poultry farming also holds great importance in Slovenian agriculture. In 2020, 27,006 farms and agricultural companies were involved in poultry farming, but market-oriented farms, which represent the bulk of poultry production, are significantly fewer. The poultry sector is organizationally different from other agricultural activities, as it relies on a vertical system of agricultural companies in cooperation with farms. The vertical system is mostly based on the connection of numerous stakeholders involved in the preparation of feed, the production of eggs for hatching and human consumption, the rearing of laying hens and broiler chickens, processing and distribution, and a system of related parallel services.

Pig farming was an important livestock activity decades ago, and was organized in a very similar way to poultry farming. After Slovenia's independence and later accession to the EU, the major-

ity of pig farmers were unable to successfully adapt to the stricter market conditions, so the number of pig farms decreased by more than 70% in the period 2000–2020, and the total number of pigs also decreased to a lesser extent. Currently, the volume of production has more than halved and the majority of pig meat is raised by a few companies and a few dozen farms. The average number of pigs per farm is 19, which is six times less than the EU average (121) (Zeleno ..., 2023; 2024).

MYTH: **Livestock farming is an unsustainable form of agriculture.**

Not true. Livestock farming is not inherently unsustainable. With an emphasis on good management and animal welfare, it can be an important part of sustainable food production.

By raising grass-fed livestock, livestock farming can make use of meadows and pastures where other crops cannot be grown, thereby contributing to food security. By-products and waste from the food processing industry, as well as crops of inferior quality that are unsuitable for human consumption, are also used as animal feed. Livestock farming can also make an important contribution to nutrient cycling in agriculture, especially on arable and livestock farms. Nutrients are returned to fields in the form of animal manure, which reduces the need for mineral fertilizers.

MYTH: **Livestock farming in Slovenia is based on the use of antibiotics and hormonal preparations.**

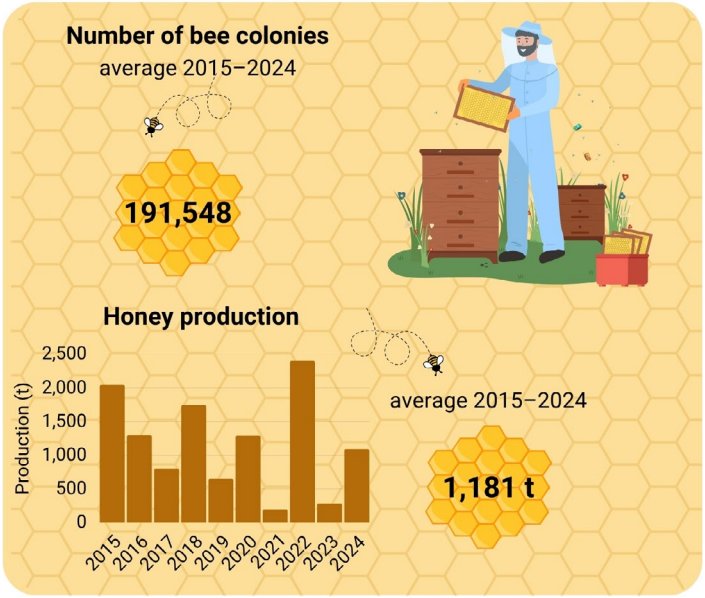
This is not true. In the EU and Slovenia, hormonal preparations and antibiotics are not permitted to achieve better breeding results. They are only used to treat diseases under the supervision of veterinarians.

In line with structural changes, such as the abandonment of farming and maintaining the cultivated landscape in areas facing natural or other specific constraints, the stock of **small ruminants** in Slovenia has been increasing and has stabilized in recent years. This primarily concerns smaller herds of sheep and goats, so the breeding of small ruminants can be attributed primarily to the ecosystem value, rather than income. However, in recent years there has been an increase in the number of farms producing sheep and goat milk and larger farms breeding small ruminants for meat, which generate income by cultivating abandoned farmland and maintain the population in marginal areas of Slovenia. A similar role to that of small ruminants in the Slovenian space is also played by **horse breeding**.

Beekeeping

Beekeeping has a long tradition in Slovenia. Slovenian beekeepers are world-renowned for breeding the autochthonous Slovenian Carniolan honey bee, traditional hives, and beehive panels. Beekeeping also represents an important agricultural branch, as it provides, in addition to bee products, the pollination of cultivated plants (fruit trees, crops), which contributes to more successful agricultural production. Pollination is also important from the point of view of preserving the ecological balance and biodiversity in nature. In the last decade, Slovenian beekeepers have collectively produced an average of around 1,200 tonnes of honey annually and maintained approximately 191,500 bee colonies (Figure 16).

Figure 16: The number of bee colonies and honey production in Slovenia; 2015–2024

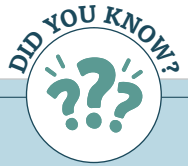


Source: Data – KIS (estimate of honey production in 2024), SURS, UVHVVR; infographic – KIS

3.1.4 Slovenia achieves a higher degree of self-sufficiency in animal products than in crops

Supplying the population with food can be ensured in two ways: through self-sufficiency or by trading with other countries. The degree of self-sufficiency shows to what extent a country covers all domestic needs (for food, feed, and industry) with its own production of agricultural products. Self-sufficiency below 100% means a shortfall that must be covered by imports, while self-sufficiency above 100% means a surplus in domestic production. Achieving a satisfactory degree of food self-sufficiency reduces dependence on other countries and is particularly important in times of uncertain conditions in international markets (Indicator KM29).

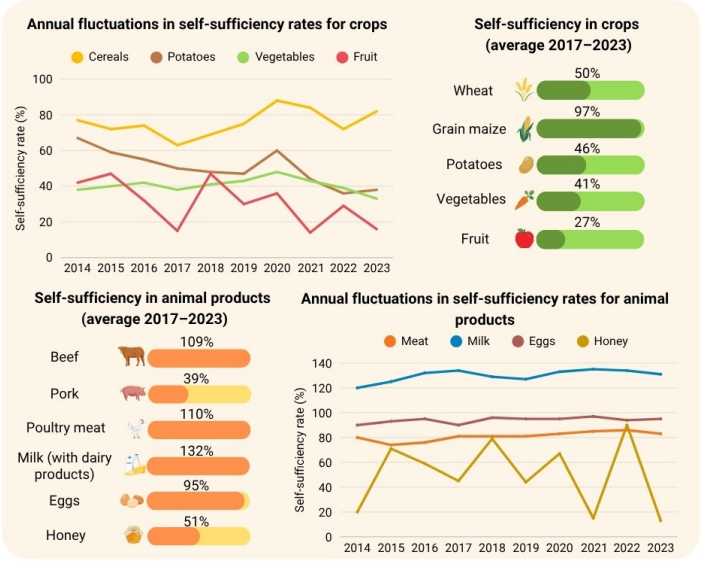
The level of self-sufficiency is influenced by the volume of production of individual agricultural products. This is based on the available area and quality of agricultural land, as well as the natural conditions, the availability of labour, the income situation of farmers, knowledge and technology, infrastructure, the presence of the processing industry, and many other factors. Ultimately, the degree of self-sufficiency also depends on consumer demand for products that are not grown or produced in the country.



Vegetable and fruit production in home gardens is very widespread in Slovenia, contributing to self-sufficiency by means of locally grown food. However, due to a lack of data, production in home gardens is not included in the calculations of the self-sufficiency rate at the national level.

Slovenia does not fully cover its needs by means of domestic production of basic agricultural products, except for milk, beef, and poultry meat (Figure 17). The lowest levels of self-sufficiency are, on average, recorded for fruit, pork, vegetables, and potatoes. In general, the self-sufficiency rates are higher for animal products than for crops.

Figure 17: The annual fluctuations in self-sufficiency rates (2014–2023) and the average self-sufficiency (2017–2023) regarding basic agricultural products in Slovenia



Source: Data – SURS; infographic – KIS

For crops, significant year-on-year fluctuations in self-sufficiency rates are evident, which are also a consequence of the occurrence of frost, hail, drought, and other unfavourable weather phenomena that affect the harvest. In the long term, only the degree of self-sufficiency regarding **cereals** is increasing, reaching around 80%. Among individual types of cereals, the degree of self-sufficiency is the highest for grain maize (97%), whose domestic production has exceeded consumption in recent years. Slovenia covers half of its needs with its own production of wheat and oats, while three-quarters of all barley needs are covered.

The degree of self-sufficiency regarding **potatoes** has been noticeably decreasing over the years due to the decreasing area of land used for growing potatoes. While self-sufficiency exceeded 80% before Slovenia's accession to the EU, it has almost halved to less than 50% today. Domestic consumption also includes processed potatoes, which Slovenia only imports, as it does not have processing capacities. The degree of self-sufficiency at the level of exclusively fresh potatoes averages 68%.

The lowest levels of self-sufficiency among crops are recorded for **vegetables and fruit.** Slovenia covers around 40% of its domestic needs with its own production of vegetables, and this share is 27% for fruit. As with potatoes, processed products are also included in the self-sufficiency calculation. The degree of self-sufficiency regarding fresh vegetables averages 55%, and regarding fresh fruit 38%. Vegetables and fruit are also characterized by strong seasonality (production is only possible at a certain time of the year under natural conditions), which means that imports are needed to meet domestic needs outside the season, which also affects self-sufficiency rates.

DID YOU KNOW?

The aggregate level of self-sufficiency regarding fruit in Slovenia is low due to the frequently unfavourable weather conditions, such as spring frosts and drought, as well as high domestic consumption of fruit that is not produced in Slovenia. More than 40% of domestic fruit consumption consists of bananas, citrus fruit, and other tropical or "southern" fruit, which are entirely imported.

The level of self-sufficiency is also influenced by the presence and development of the food processing industry and other key food supply infrastructure. Slovenia has no potato processing plants, while the processing of vegetables and fruit relies mainly on imported raw materials. In the past, more land was planted with fruit varieties intended for processing. With the discontinuation of the processing of designated varieties, these fruit varieties became unattractive to traders and consumers, which was followed by the abandonment or reduction of permanent crop area.

There are opportunities to increase the level of self-sufficiency regarding individual agricultural products in Slovenia, but these are limited by the available arable land. Increasing self-sufficiency in one sector could therefore lead to a decrease in self-sufficiency in other sectors. Possible solutions include technological advances in agriculture, the reintegration of uncultivated and overgrown land into agricultural production, the protection of agricultural land (Revizijsko ..., 2021), better management of the risks associated with outdoor production, and the creation of an appropriate and stable business environment that will attract farmers.

Compared to crops, the degree of self-sufficiency is more stable regarding animal products. While self-sufficiency rates for beef (109%), milk (132%), and small ruminant meat (94%) are high due to the natural conditions and suitable conditions for pasture farming, the high self-sufficiency rates for poultry meat (110%) and eggs (95%) reflect the specific characteristics of both markets. Conversely, self-sufficiency regarding pork is low, averaging 39%, which is also result of the structural changes in pig farming following Slovenia's accession to the EU. Greater fluctuations in self-sufficiency rates are only characteristic of honey production, which is most affected by weather conditions during the flowering and nectar flow of plants. On average, Slovenia covers half of its needs regarding honey.

MYTH: **A high level of self-sufficiency entails a high level of food security for the country.**

This is not entirely true. The concept of self-sufficiency is flawed in some respects, as it does not take into account the country's dependence on imports of intermediate raw materials. Slovenia is heavily dependent on imported raw materials for agriculture and other processes within the food system (seeds, fertilizers, veterinary medicines, plant protection products, energy, etc.), which in the event of crisis situations and restricted trade can lead to reduced food production and threaten food security (MKGP, 2024a).

3.1.5 The negative impacts of agriculture on the environment and climate are decreasing in Slovenia

Agriculture is an economic sector closely linked to the environment. Its activities can affect the quality of soil, water, air, biodiversity, human and animal health, and the climate, both positively and negatively.

Pressures on the environment are primarily related to the incorrect or excessive use of fertilizers and plant protection products, inappropriate soil management, emissions of greenhouse gases and pollutants into the air, and unsustainable land use (Poročilo ..., 2022). However, by adopting more appropriate practices, agriculture can significantly reduce its negative impacts on the environment and contribute to the preservation of natural resources.

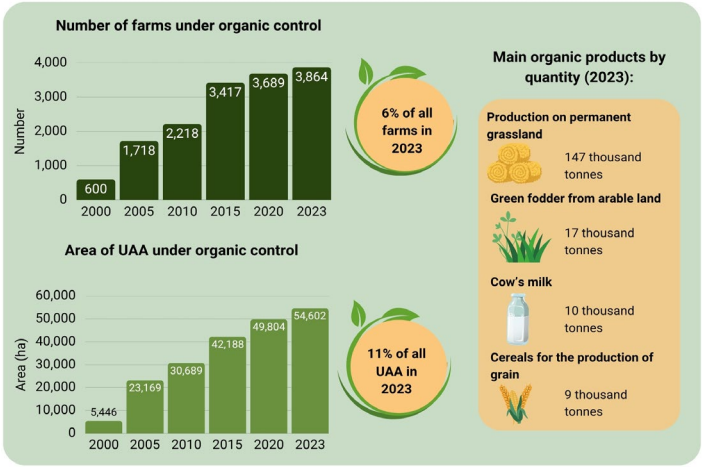
In Slovenia, agriculture is a sector that has taken numerous steps to reduce pressures on the environment, as evidenced by systematic long-term monitoring and the results of environmental and agricultural indicators (https://kazalci.arso.gov.si/en), which are presented in this chapter.

Organic farming

Organic farming is a form of agriculture that focuses on sustainable food production, following the principles of producing high-quality and healthy food, good animal welfare, preserving biodiversity, protecting natural resources, and sustainable rural development. The field of organic farming is regulated by legislation, and various restrictions apply, such as a ban on the use of easily soluble mineral fertilizers, synthetic plant protection products, genetically modified organisms, and growth regulators (Indicator KM08).

Organic farming has been established in Slovenia for several decades, and its scope is increasing. In 1999, when the first support payments for this type of production were made, 2,400 hectares, or 0.5% of all cultivated areas, were included in organic control. According to SURS data, in 2023, 3,864 organic farms (farms with organic certification and farms in conversion) cultivated nearly 55,000 hectares, or 11% of all utilized agricultural area (Figure 18).

Figure 18: The number of farms and area of UAA (2000–2023), and main products under organic control (2023) in Slovenia



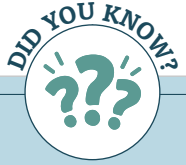
Source: Data – ARSO (Indicator KM08), SURS; infographic – KIS

The predominant form of land use in organic farms is permanent grassland and pasture, which, according to SURS data for 2023, accounted for 78% of the total area of land under organic cultivation, while arable land accounted for 15%, and permanent crops

for 7%. Consequently, hay from permanent grassland predominates quantitatively among organic crop production, and green fodder is mainly grown on arable land. The production of organic cereals also stands out, which more than tripled between 2012 and 2023. On average over the last five years (2019–2023), approximately 6,000 tons of organic cereals were produced annually, with wheat, spelt, and maize for grain accounting for the largest share.

On livestock farms included in organic control, cattle and poultry predominate in terms of animal numbers, thus cow milk, beef, and eggs are the most widespread animal products in the supply of organic products (Zeleno ..., 2024).

Despite the increasing scope of organic farming, the supply of organic food does not meet demand, particularly regarding fruit and vegetables. Slovenia is expected to reach at least a 10% share of organic farms and at least 18% of organic utilized agricultural area by 2027 (Akcijski ..., 2022). EU guidelines foresee achieving a 25% share of organic land by 2030 (Zeleno ..., 2024).



In terms of **the share of agricultural land under organic control**, Slovenia exceeded the EU average (9.9%) in 2021 and was in the top third of EU Member States (Indicator KM08).

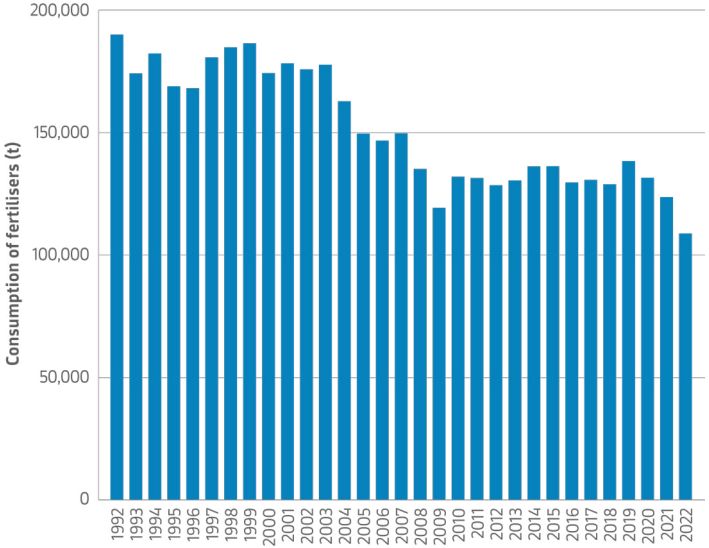
The potential for increasing organic crop and livestock production in Slovenia exists, but more intensive changes in the short term are difficult to expect. The challenges lie in the amount of suitable land for production, the marketing of products, the cost-effectiveness of production, and price uncompetitiveness compared to imported organic products.

The use of mineral fertilizers and nutrient balance surpluses

Mineral fertilizers are substances containing plant nutrients that are added to soils or plants in agriculture in order to improve growth, increase and improve crop quality, or increase soil fertility. Unlike organic fertilizers, they are obtained by means of industrial processes. The field of fertilization with mineral fertilizers covers various strategic and legislative documents whose aim is to balance fertilizer use in agriculture, prevent burdening, the optimal utilization of nutrients with minimal losses into groundwater and the atmosphere, and to reduce and prevent the pollution of waters with nitrates from agriculture (Indicator KM02).

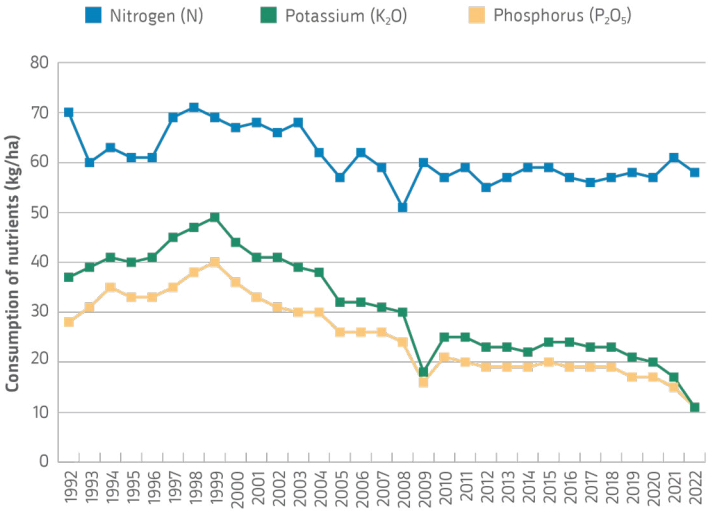
The total consumption of mineral fertilizers in Slovenia has decreased significantly. In the period 1992–2022, it decreased by 38% (Figure 19), and the consumption of major plant nutrients (nitrogen, phosphorus, potassium) per hectare of utilized agricultural area decreased by 30% (Figure 20). Of the individual plant nutrients, the consumption of potassium (by 65%) and phosphorus (by 62%) decreased the most. The trend of decreasing and interannual fluctuations in the consumption of plant nutrients from mineral fertilizers is the result of new agricultural practices, knowledge, and technologies that increase nutrient utilization, as well as the prices of mineral fertilizers and agricultural products (Zeleno ..., 2024).

Figure 19: The consumption of mineral fertilizers in Slovenia; 1992–2022



Source: ARSO (Indicator KM02)

Figure 20: The consumption of major plant nutrients (nitrogen, phosphorus, potassium) per hectare of UAA; 1992–2022

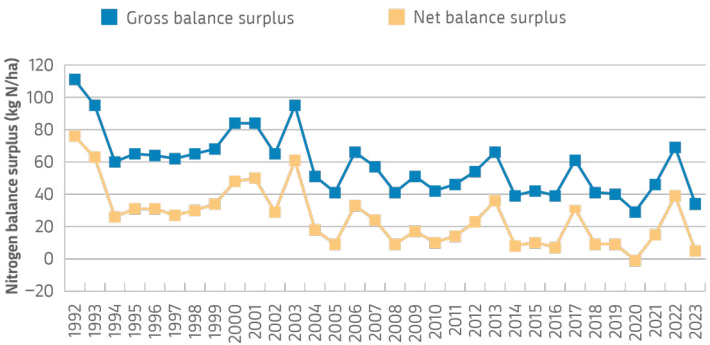


Source: ARSO (Indicator KM02)

Balances of the main plant nutrients, such as nitrogen and phosphorus, are important in determining the potential environmental pollution from agriculture. They show the difference between the total input to agricultural land from various sources and their removal by crops. The main sources of nutrient input are fertilizers, seeds and planting material, and, for nitrogen, atmospheric deposition and biological fixation by legumes. Large surpluses reflect poor nutrient management, as well as environmental factors. The largest balance surpluses are usually detected in drought years, when the removal of nutrients from agricultural land is lower due to reduced yields (Indicator KM22).

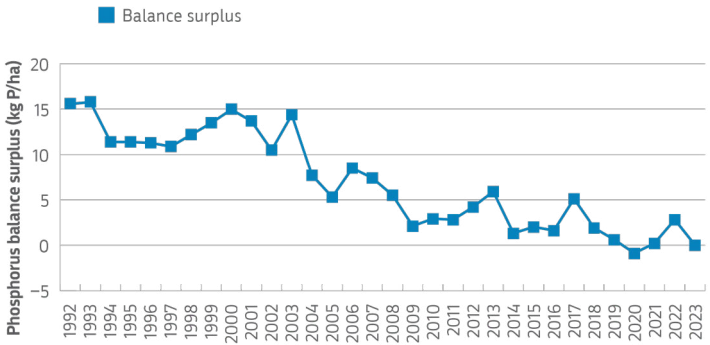
The gross balance surplus of nitrogen in agriculture decreased by 54% in the period 1992–2023 (Figure 21). Meanwhile, **the net balance surplus** (excluding nitrogen lost to the air through ammonia and nitrogen oxide emissions) decreased by 85% over the entire period. This indicates better nitrogen management in agriculture and, consequently, a contribution to reducing nitrogen compound emissions into the environment.

Figure 21: The nitrogen balance surplus in Slovenian agriculture (kg/ha); 1992–2023



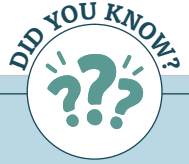
Source: ARSO (Indicator KM22)

Figure 22: The phosphorus balance surplus in Slovenian agriculture (kg/ha); 1992–2023



Source: ARSO (Indicator KM25)

The **balance surplus of phosphorus** also decreased significantly in the analysed period (1992–2023), by 107% (Figure 22). The balance improved as a result of the reduced input of mineral (–68%) and livestock (–18%) fertilizers and increased removal by crops (+26%). The results on phosphorus balance surpluses must be interpreted in connection with data on soil stocks regarding this element. Excessive stocks of phosphorus in soils pose a potential risk of water pollution, as phosphorus can leach into the soil solution. However, soil analyses in Slovenia show that we have more problems with phosphorus deficiencies than with surpluses, so a further reduction in the phosphorus balance surplus at the national level is not desirable (Indicator KM25)



Plant production removes plant nutrients from the soil. In order to maintain soil fertility, which is the basis for the sustainable use of agricultural land, nutrients must be returned through fertilization. Fertilization must be carried out in accordance with good practices that reduce the risk of environmental pollution (Indicator KM26).

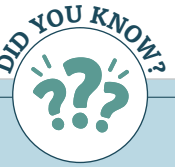
A sufficient content of organic matter in the soil has positive effects on crop size, water retention in the soil, and less leaching of nutrients and pollutants into the groundwater. In Slovenia, the soil organic matter content is good and comparable to other countries with similar climatic conditions, and (very) good compared to Mediterranean countries in Europe (Indicator KM26).

The use of plant protection products

Plant protection products are preparations used in agriculture to protect plants or crops from pests, disease agents, and weeds. According to their action, they are divided into fungicides, herbicides, insecticides, acaricides, and other plant protection products (Zeleno ..., 2024).

In the last thirty years, the total use of plant protection products in Slovenia, which also includes non-agricultural use, has decreased by more than half, from 2,031 tons in 1992 to 914 tons in 2021 (Figure 23). At the same time, the consumption per hectare of cultivated land where plant protection products are used (arable land, gardens, permanent crops) has also decreased. Between the periods 2000–2009 and 2010–2020, average consumption decreased from 6.7 kg to 5.4 kg of active substance per hectare, and in 2021 it amounted to 4.5 kg per hectare, which is the lowest in the monitoring period (Indicator KM01).

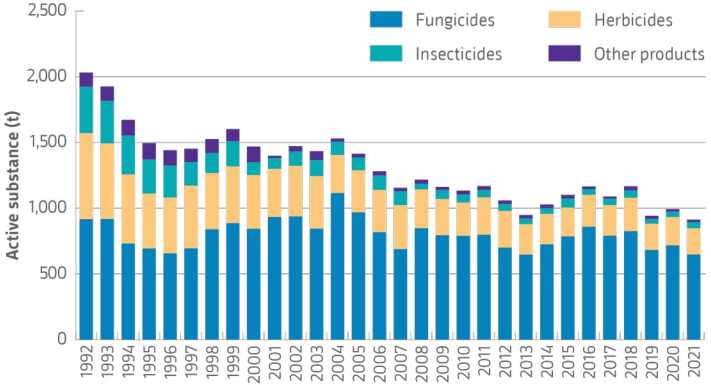
In the period under consideration, the consumption of all groups of plant protection products decreased in Slovenia. The decrease in herbicide consumption is primarily due to the use of newer groups of preparations that require lower application rates per area, as well as changes in the cropping structure. In the last twenty years, agricultural areas with crops that require a higher use of plant protection products (winter cereals, maize, potatoes, oilseed rape) have noticeably decreased, while green fodder from arable land has increased. A smaller part of the decrease utilized is also due to the transition to non-chemical plant protection methods.



The active substances in plant protection products for use at the EU level are approved by the European Commission after thorough evaluation. Individual Member States can then register products containing approved active substances for marketing and use on their own territory. An application for registration is usually submitted by the manufacturer or representative of the manufacturer of the product.

In Slovenia, the range of registered products for use is quite limited. In January 2024, 441 active substances were approved in the EU, while only 165 active substances were registered for use in Slovenia (MKGP, 2025a). One of the reasons for this is the small size of the Slovenian market. The registration process is lengthy and financially demanding, so manufacturers of plant protection products often focus on countries where demand is higher and investment in registration is therefore more economically justified.

Figure 23: Wholesale sales of plant protection products in Slovenia (tons of active substance); 1992–2021



Note: This includes sales for agricultural and non-agricultural purposes (green areas, sport fields, roads, railways etc.)

Source: ARSO (Indicator KM01)

MYTHS & TRUTHS

MYTH: **Agricultural production is entirely possible without the use of mineral fertilizers and plant protection products.**

This is generally not true. In modern agriculture, the use of mineral fertilizers and plant protection products is a reality and a necessity in order to ensure food safety and nutritional security for the growing global population. However, responsible and controlled use is essential, while striking a balance between agricultural production and reducing risks to the environment and human health.

Agricultural production without the use of synthetic mineral fertilizers and plant protection products is made possible by agricultural practices such as organic and biodynamic farming, which are being implemented to a lesser extent around the world and in Slovenia.

MYTH: **The use of plant protection products is decreasing, but they are becoming increasingly concentrated.**

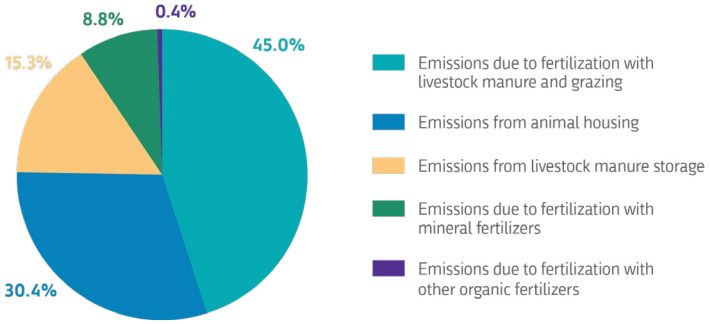
This is not true. Due to the different forms and concentrations of the products, data on the sale of plant protection products refer to the quantity of pure active substances, so the data on the reduction in consumption are reliable.

Ammonia emissions

Ammonia is also part of the nutrient balance and, besides nitrogen losses to water, it is the most important source of nitrogen loss from agriculture. Ammonia has numerous negative effects on human and animal health, the environment, biodiversity, and the economy, and also contributes to indirect greenhouse gas emissions (Indicator KM13).

In Slovenia, agriculture contributes the majority of all ammonia emissions (97% in 2022), and in the structure of emissions from agriculture, most ammonia is released during fertilization with livestock manure and grazing, followed by emissions from animal housing, emissions from livestock manure storage, and emissions due to fertilization with mineral and other organic fertilizers (Figure 24).

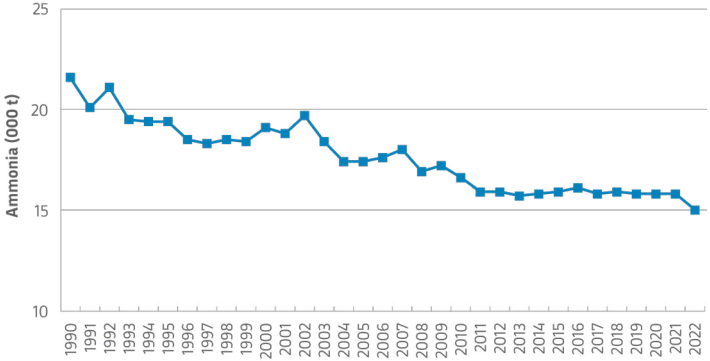
Figure 24: Sources of ammonia emissions in Slovenian agriculture; 2023



Source: ARSO (Indicator KM13)

Total ammonia quantities in agriculture decreased by more than a quarter in the period 1990–2022 (Figure 25). Over the entire period, emissions decreased the most in pig farming, during the fertilization of agricultural plants with livestock manure, and in poultry and cattle farming. Regulations in the field of water protection and agricultural policy measures contributes to lower emission levels.

Figure 25: The trend of ammonia emissions (000 t) in Slovenian agriculture; 1990–2022



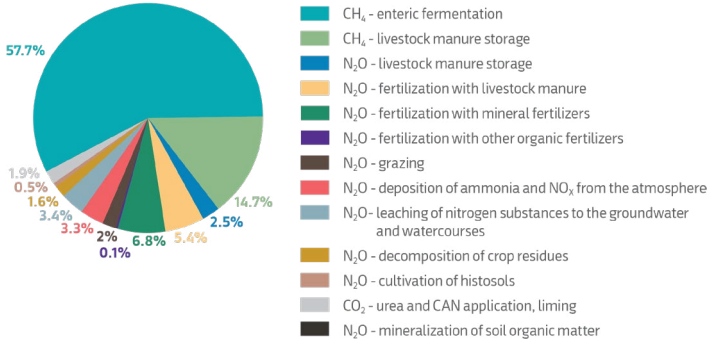
Source: KIS (National Inventory Data for Slovenia)

Greenhouse gas emissions into the atmosphere

Agriculture contributes about one-tenth of all greenhouse gas (GHG) emissions in Slovenia, with the largest share from livestock farming (Indicator PB03). Among GHGs, methane, nitrous oxide, and carbon dioxide are the most important in agriculture. **Methane** is formed during the fermentation of feed in the digestive systems of reared animals and during the storage of livestock manure, and accounts for 73% of all GHG emissions (Figure 26).

Most **nitrous oxide**, which accounts for 25% of GHG emissions in agriculture, is formed due to fertilization with livestock and mineral fertilizers and the storage of livestock manure. **Carbon dioxide**, released due to liming agricultural soils and fertilization, accounts for less than 2% of total GHG emissions in agriculture. Carbon dioxide formed by the use of fossil fuels in agriculture is not included in this calculation (Indicator KM14).

Figure 26: Structure of greenhouse gas emissions in agriculture; 2022



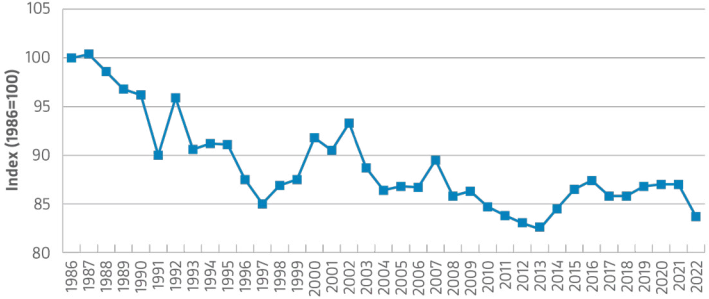
Source: ARSO (Indicator KM14)

DID YOU KNOW?

Agricultural land is both a source and a sink of carbon dioxide, as various practices bind carbon dioxide from the air, helping to mitigate climate change. Changes in carbon stocks in agricultural soils are most influenced by farming practices, in particular fertilizer application, ploughing depth, and measures to increase the organic matter in soil.

Annual GHG emissions from agriculture decreased noticeably between 1986 and 2022, primarily due to improved manure and fertilization practices and improved efficiency of rearing (Figure 27). Emissions of methane decreased by 17%, emissions of nitrous oxide by 13%, and the greenhouse effect of all gases, expressed in carbon dioxide equivalents, by 16%. In 2022, Slovenia achieved the goal set in the Integrated National Energy and Climate Plan of the Republic of Slovenia until 2030 (reducing GHG emissions in agriculture by 1% by 2030 compared to 2005). In terms of emissions reduction, Slovenia is comparable to Western European countries (Indicator KM14).

Figure 27: Trend of greenhouse gas emissions in agriculture (1986 = 100); 1986–2022



Source: ARSO (Indicator KM14)

Agri-environmental measures

Environmental protection within agriculture is particularly highlighted by agri-environmental measures, in which farms can voluntarily participate. These measures, with various forms of support, encourage the preservation of or transition to environmentally friendly agricultural production methods that contribute to improving soil and water quality, maintaining soil fertility, biodiversity, and traditional rural landscapes, and thus to the sustainable use of natural resources. Support is intended to cover additional costs or compensate for lost income resulting from more demanding farming conditions (Indicator KM03).

Agri-environmental measures have been implemented in Slovenia since 1999, but to a greater extent since joining the EU. An increasing area of agricultural land is included in these measures. Between 2015 and 2022, the net area of agricultural land (without double-counting areas where more than one measure is implemented) with agri-environmental measures increased from 65,354 to 97,652 hectares, a 49% increase. The proportion of such land in relation to total utilized agricultural area thus increased from around 14% to around 20%.

MYTH: **Livestock farming is the main source of greenhouse gas emissions.**

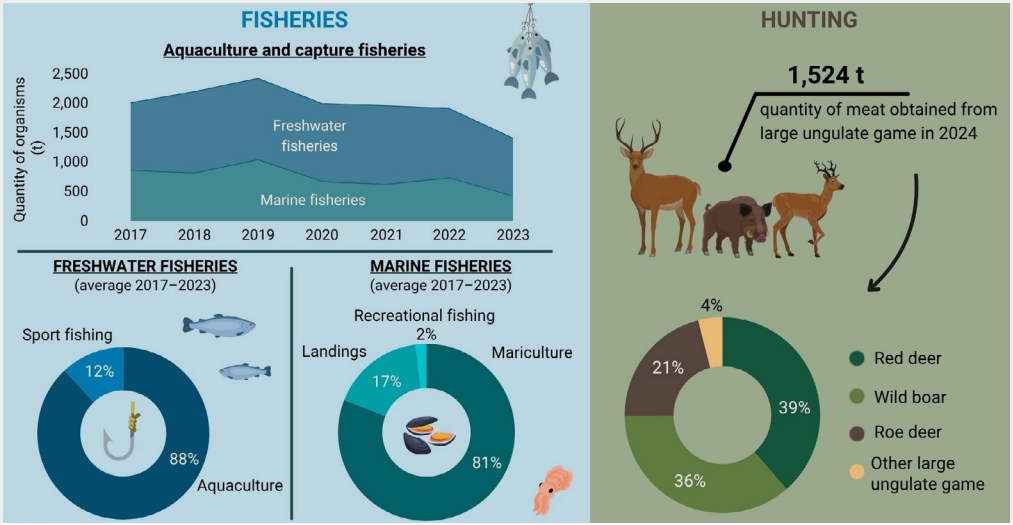
This is not true. Agriculture, and livestock farming in particular, are not the main contributors to greenhouse gas emissions in Slovenia. In Slovenia, the largest source of greenhouse gas emissions is the burning of fossil fuels, with the largest share coming from the energy sector (electricity and heat production) and transport (road transport). Together, these two sectors accounted for almost 60% of all emissions in 2022. Agriculture contributed 11% of greenhouse gas emissions in the same year (Indicator PB03).

3.2 FISHERIES AND HUNTING ALSO PROVIDE US WITH FOOD

Fisheries and hunting are traditional activities in Slovenia that contribute to a lesser extent to the food supply of the population. Within fisheries, an average of 2,000 tons of aquatic organisms – fish, crustaceans, and molluscs – were raised or caught annually in the period 2017–2023 (Figure 28). Of this, approximately 40% were marine and 60% freshwater organisms. In **freshwater fisheries**, the vast majority of fish was bred in fish farms (88%), while a smaller proportion was caught through recreational fishing (12%). In **marine fisheries**, mariculture (breeding marine fish and shellfish) also predominated, accounting for 81% of the total raised or caught.

In 2024, approximately 1,500 tons of meat from large ungulate game were obtained through hunting (Figure 28). The majority of this was red deer meat (39%) and meat from wild boar (36%), the population of which has increased significantly in recent years. The remaining game meat consisted of roe deer meat (21%) and other large ungulate game (e.g. chamois, fallow deer, European mouflon; 4%).

Figure 28: Freshwater and marine fisheries (2017–2023) and hunting (2024) in Slovenia

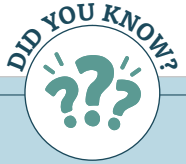


Source:
Data – GOZDIS-OSLIS, MKGP, SURS, ZZRS;
infographic – KIS

3.3 CLIMATE CHANGE SIGNIFICANTLY IMPACTS FOOD PRODUCTION

Similar to the global situation, Slovenian agriculture is heavily dependent on weather and climatic conditions, making it one of the more vulnerable systems, as it is exposed and sensitive to the impacts of climate change, while also having limited ability to adapt. Consequently, both the country's food sovereignty and the economic stability of agriculture are threatened.

Extreme weather events, such as drought, heat waves, floods, hail storms, frost, the **appearance of invasive species**, as well as the **more intense presence and spread of pests, weeds, and diseases**, have the greatest impact on agriculture. The degree of vulnerability to climate change varies considerably between different agricultural activities. Within crop production, individual sectors are facing significant fluctuations in the quantity and quality of yields, primarily due to drought and extreme weather events. Those producers who do not have the possibility of growing a wider range of agricultural plants throughout the year or whose growing areas are not protected by anti-hail nets and greenhouses are the most vulnerable (e.g. outdoor vegetable producers). Compared to crop production, livestock farming is generally less vulnerable, as it is primarily facing yield losses of feed and heat stress in farm animals due to climate change. Within livestock farming, beekeeping is facing the greatest degree of vulnerability.



The fishing industry is also feeling the effects of climate change through changes in the distribution of certain aquatic species, declines in the populations of some species, reduced productivity, and damage to infrastructure due to extreme weather events (FAO, 2018a).

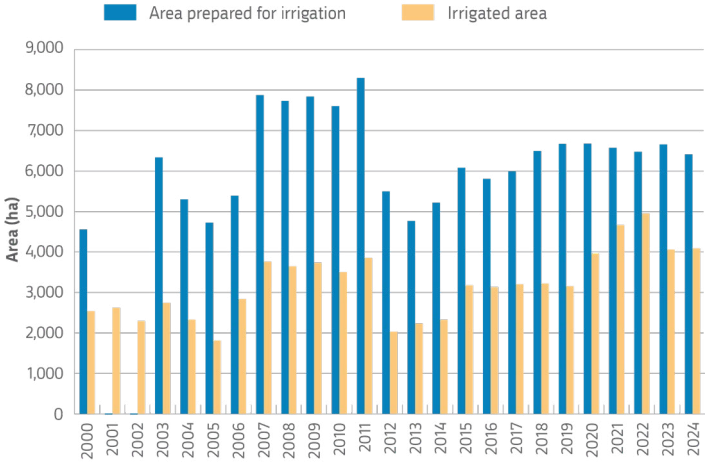
Slovenia is increasingly facing heat stress and drought, which cause significant yield and income losses in agriculture. Drought periods are occurring in the growing season of plants almost every year, and seven droughts with the dimensions of a natural disaster were recorded between 2000 and 2024 (Indicator PP14). Among other major impacts of climate change that Slovenian agriculture is already facing, there is an increased thermal load, frosts, a changed rainfall regime, which increases the risk of both hydrological extremes (droughts and floods), and more intense storms.

Slovenia ranks first in the EU in terms of economic damage caused by weather and climate extremes. Between 1980 and 2023, the damage reached EUR 17.5 billion, which amounts to approximately EUR 8,700 per capita (EEA, 2025a). The impacts of climate change will become increasingly significant over time, making the adaptation of agriculture necessary in order to maintain production stability and sustainable development. Adaptations depend on the decisions and actions of individual farmers, as well as on agricultural policy, market mechanisms, and development and technological research. Slovenia co-finances the implementation of measures for **adapting to climate change** within the framework of the Common Agricultural Policy. These measures include adapting production and farming practices (e.g. the selection and use of resistant plant varieties and suitable animal breeds, and proper soil use), irrigation, protection against adverse weather events (suitable barns, greenhouses, anti-hail nets, frost protection), protection against diseases and pests,

income protection for farmers, and information and advisory services. Measures for adaptation to drought receive the greatest amount of funding (Podnebno..., 2024).

Irrigation is one of the measures by which agriculture can successfully adapt to the consequences of drought, as it enables a quantitatively and qualitatively stable yield. However, irrigation is poorly utilized in Slovenia: in 2024, only 1.3% of all utilized agricultural area was prepared for irrigation (Figure 29), which places Slovenia among the EU countries with the smallest proportion of agricultural land prepared for irrigation. Of the land prepared for irrigation, around 4 thousand hectares were irrigated in 2024 (Indicator KM21).

Figure 29: Area of agricultural land prepared for irrigation and irrigated areas in Slovenia; 2000–2024



Source: ARSO (Indicator KM21)

The negative impacts of climate change are reflected not only in agriculture but throughout the entire food system. In addition to unstable food production, climate change also has a significant cost-price effect. Fluctuations in prices and difficulties in accessing the necessary quantities of produce hinder the smooth operation of other actors in the food supply chain (processing, distribution, trade). While producers often receive assistance in the event of crop failure, other links in the chain pass on the resulting costs to the consumer.

Adaptation to climate change should not be haphazard, but should be based on information about climate projections and coordinated between sectors (Poročilo..., 2022). Multipurpose adaptation measures offer the greatest benefits, as adaptation involves the planned reduction of vulnerability and an increase in resilience to the perceived and expected impacts of climate change, with the aim of reducing or preventing damage. Linkage with climate change mitigation measures is also desirable, as such contribute to reducing greenhouse gas emissions into the atmosphere while simultaneously encouraging increased uptake (sinks) of these gases from the atmosphere. The key measures on agricultural land that are important for reducing emissions or increasing sinks include, in particular, the greening of arable land over the winter, maintaining crop rotation, conservation tillage, and subsequent and undersown crops.

Understanding the complex interplay between climate change and food supply chains is crucial for developing effective strategies for risk reduction, strengthening adaptation, and promoting sustainability. With a comprehensive approach that combines scientific findings, technological innovations, and stakeholder engagement, society can strive to build more resilient and equitable food supply chains in a changing climate. **With appropriate measures, the negative consequences of climate change can be significantly mitigated, and in some cases, changes can even be exploited for the benefit of sustainable food production.**

3.4 AGRICULTURAL POLICY PROMOTES THE MULTIFUNCTIONAL ROLE OF SUSTAINABLE AGRICULTURE

In Slovenia, most agricultural measures are implemented within the framework of the Common Agricultural Policy of the EU (CAP). This is a key mechanism that helps farmers produce food while ensuring that consumers have access to **safe, affordable, and high-quality food**. The CAP represents a partnership between agriculture and society, and between EU Member States and their farmers (EC, 2025b).

Its main objectives are the following:

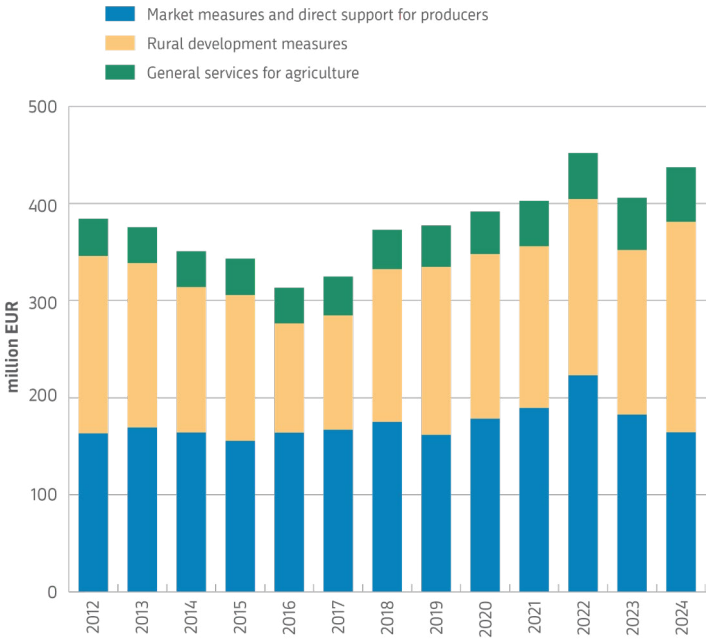
- to support farmers and increase their productivity so that they can regularly supply the population with accessible and quality food;
- to ensure that farmers can live decently from their work;
- to contribute to mitigating climate change and to the sustainable management of natural resources, such as water, soil, and biodiversity;
- to preserve rural areas and cultural landscapes throughout the EU;
- to promote a vibrant rural economy, job creation, and development in agriculture, food processing, and other related activities.

The benefits of agricultural policy are even broader. The conditions set for farmers enable them to perform their role in society by producing diverse, quality, and safe food, and by preserving culinary traditions and food culture. They also contribute to the preservation of the countryside, the development of rural infrastructure, and the creation of new jobs. All of this is based on sustainable management practices, with smart and careful management of natural resources – which is crucial for our food, the quality of life today, and future generations.

The main groups of agricultural policy measures are as follows (Figure 30):

- **Market measures and direct support for producers.** Income support stabilizes income and encourages environmentally friendly farming and the provision of public services that the market does not pay for (e.g. countryside landscape maintenance).
- **Rural development measures**, which respond to the specific needs of rural areas, such as farming in areas with more difficult conditions, organic farming, the modernization of farms, the development of non-agricultural activities, etc.
- **General services for agriculture**, which are mostly financed from national funds, support research, advisory services, agricultural education, and measures in the field of veterinary, phytosanitary, and food quality.

Figure 30: Payments to agriculture (national and EU funds; EUR million); 2012–2024



Source: ARSKTRP, MF, MKGP, KIS calculations, Zeleno ... (2024)

In Slovenia, approximately 70% of funds for agricultural policy measures come from the common EU budget. The current CAP is implemented through the CAP Strategic Plan 2023–2027, which includes measures to achieve three general objectives, nine specific objectives, and one horizontal objective for the dissemination of knowledge, innovation, and digitalization (Figure 31).

MYTH: **Farmers receive too many subsidies.**

This is not true. Agriculture differs from other economic activities due to its specific characteristics such as high dependence on weather conditions and lower average incomes compared to non-agricultural activities. The payments that farmers in the EU receive under the agricultural policy are an important mechanism for income stabilization, as they mitigate the negative effects of price fluctuations, crop failures, and higher production costs due to less favourable natural conditions for farming, thus ensuring the long-term survival of farmers and the food security for the population.

In order to receive payments, farmers must meet a number of prescribed requirements arising from CAP measures – they must farm in a sustainable and environmentally friendly manner, preserve soil and biodiversity, and take into account the welfare of people and animals. The payments thus cover part of the additional labour and material costs incurred in meeting these requirements, while also rewarding farmers for providing public services such as ecosystem services and caring for the countryside.

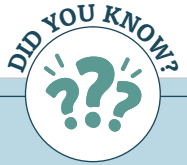
As of 2025, an extensive package of agricultural legislation is under consideration (the Agriculture Act, the Food Act, the Safe Food and Feed Act). The revised legislation, among other things, defines sustainable agriculture, addresses the transition to a more resilient and sustainable agri-food system among the objectives of agricultural policy, and provides the legal basis for the production of quality food, the organization of agri-food chains, and the protection of consumers (MKGP, 2025b).

Figure 31: Objectives of the CAP Strategic Plan 2023–2027 for Slovenia

1	2	3
To foster a smart, competitive, resilient, and diversified agricultural sector that ensures long-term food security	**To support and strengthen environmental protection, including biodiversity and climate action, and to contribute to the environmental and climate-related objectives of the EU, including its commitments under the Paris Agreement**	**To strengthen the socio-economic fabric of rural areas**
(1) To support sustainable farm income and the resilience of the agricultural sector across the EU in order to enhance long-term food security and agricultural diversity, as well as to ensure the economic sustainability of agricultural production in the Union	(4) To contribute to climate change mitigation and adaptation, including the reduction of greenhosue gas emissions and the enhancement of carbon sequestration, as well as to promote sustainable energy	(7) To attract and retain young farmers and other new entrants into the farming profession, as well as to foster the sustainable development of rural businesses
(2) To enhance the market orientation and strengthen both the short- and long-term competitiveness of farms, including by promoting a greater focus on research, technology, and digitalization	(5) To foster sustainable development and the efficient management of natural resources such as water, soil, and air, including by reducing dependence on artifical chemicals	(8) To promote employment, growth, and gender equality, including the participation of women in agriculture, social inclusion, and local rural development, including circular bioeconomy and sustainable forestry
(3) To improve the position of farmers within the value chain	(6) To contribute to halting and reversing the trend of biodiversity loss, to enhance ecosystem services, and to preserve habitats and landscapes	(9) To improve the agricultural sector's response to societal demands related to food and health, including high-quality, safe, and nutritious food produced in a sustainable way, as well as to reduce food waste, improve animal welfare, and combat antimicrobial resistance
Horizontal objective: To modernize agriculture and rural areas through the promotion and transfer of knowledge, innovation, and digitalization		

Source: MKGP (2024b)

In addition to CAP measures, national measures are also implemented in Slovenia, representing approximately 30% of all funds for agriculture. Some are regular (e.g. the co-financing of insurance premiums), while others are exceptional and are implemented in the event of extraordinary events (e.g. natural disasters). Local communities and regional public funds also support agriculture, mainly through favourable loans or the co-financing of interest rates for investments in agricultural holdings.



Only about 3% of the budget for agriculture is allocated to promoting the consumption of Slovenian agricultural products in the form of promotions and school schemes. In order to significantly strengthen the sustainable transformation of food systems, consumers would need to be supported more generously by other sectors as well, not just agriculture.

The state also provides funding for fisheries and hunting, which, unlike most agricultural measures, is intended to ensure the provision of general services and operations, rather than directly benefiting fishermen and hunters.

4 THE PROCESSING, DISTRIBUTION, AND SALE OF FOOD

In addition to primary producers (agriculture, fisheries, hunting), a broad network of actors – processors, distributors, traders, and food retailers – ensures the food supply to the population. By creating added value from agricultural products and linking them into "farm-to-table" chains, a favourable business environment is created for all stakeholders.

Foto © Sara Bele

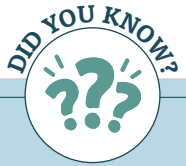
The majority of food enters the food supply chain through purchasers and the food processing industry. The latter enables longer shelf life, increased safety and greater diversity of food through various stages of processing, preservation, and packaging. Distributors connect producers and food processors with end consumers. Food is stored in distribution centres under controlled and, if necessary, refrigerated conditions, and then transported onward to wholesalers and retailers, which sell food to consumers.

4.1 FOOD PROCESSING COMPANIES ARE A KEY LINK IN THE FOOD SUPPLY CHAIN

Food processing companies play a key role in food supply chains by processing agricultural products into finished food products; therefore, a strong and efficient agri-food sector is extremely important for the entire agriculture sector. The co-operative system, with its 53 agricultural co-operatives, and other organized forms of cooperation between producers and purchasers of agricultural products, play an important role in strengthening and developing food supply chains in Slovenia.

The individual food supply chains in Slovenia vary greatly as to their characteristics and potential. The stable production – and consequently also the competitiveness, resilience, and economic position – of a particular type of food are strongly dependent on the organization of the given chain. **In Slovenia, the organization and connectedness of the chain are greatest for milk and beef**, which are also the most stable sectors in Slovenian agriculture. A branched and organized purchasing network, based on contractual relationships and the provision of services such as logistics and administration, ensures a smooth supply and operation of processing activities, and a daily supply of fresh products. Good organization, combined with favourable conditions for rearing, contributes to a high level of food security and self-sufficiency regarding milk and beef.

Poultry farming is also well organized due to the specificities of its business model. The production, purchasing, processing, and supply of the most important cereals as well as milling and bakery products are also reasonably organized, although to a lesser extent. Conversely, **connections are weak in vegetable growing, fruit growing, pig farming, and honey and oilseed**



According to AJPES data, companies engaged in the **production of food and beverages** accounted for 9% of all companies in the processing sector in 2023 and contributed 8% to total employment.

production, with a large part of the products being marketed directly by producers on farms and at markets.

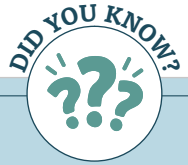
Good organization of the chain, in addition to linkage through purchasing and sales, also pursues coordinated production planning to ensure a smooth supply to the food processing industry or directly to consumers. This was well organized in the past in pig farming and for fruit intended for processing. Today, these needs for connection, despite rare practices, are most evident with regard to vegetables. For all food production sectors in Slovenia, **the weakest connection between stakeholders is at the end of the food supply chains, at retail stores, and at the consumer level.**

4.2 CONNECTEDNESS IS NEEDED FOR A STABLE FOOD SUPPLY

Slovenia supports various forms of stakeholder connection in the food supply chain within the framework of its agricultural policy. The connection can be horizontal, for example among farmers, or vertical, such as the connection between farmers and purchasers.

Producers, especially of fruit and vegetables, are increasingly recognizing the importance and benefits of connection. Together with co-operatives or other companies, they plan production, invest in cooling and storage capacities, create local brands, participate in quality schemes, and thereby strengthen competitiveness and economic efficiency. Any activity aimed at preserving its own and sovereign food system is very important for the sustainability of the Slovenian food system, which is particularly vulnerable due to its small size. Therein, the Slovenian agri-food sector plays a key role as a connecting link.

Slovenia has a rich network of retail stores, which generate around a quarter of their revenue from food sales (27% in 2023, according to SURS), and the food market is dominated by



The importance of short and local food supply chains

Locally grown and seasonal food supply means a shorter chain from producer to consumer. This reduces the possibility of contamination and the need for longer transport routes, which have a greater negative impact on the environment. It is linked to the preservation of dietary habits to which people and their digestive systems are best adapted. Shorter transport routes allow for the consumption of fresher and, in some cases, higher quality products, such as vegetables and fruit that are harvested when ripe (Revizijsko ..., 2021).

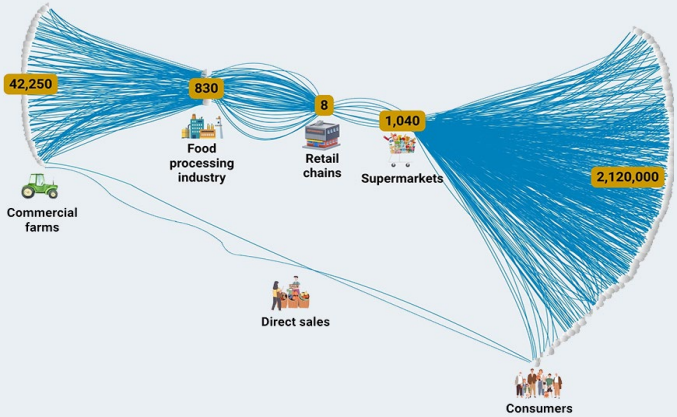
By buying food from local producers, consumers can support their health and help strengthen Slovenian agriculture and food self-sufficiency, which reduces dependence on imports. At the same time, it preserves the cultivation of agricultural land, the rural population, and jobs, and reduces poverty and social inequality in the countryside.

eight major retail chains. Strengthening the connection of food producers is a response to the increasing concentration in the food chain, which is reflected in the great power of the retail chains (Figure 32). These can dictate the prices of products and set other conditions for suppliers due to their power, putting small farms and companies in a disadvantageous position. Due to the emergence of numerous unfair practices, Slovenia has legally defined the function of a **supply chain ombudsman** since 2015, whose main tasks are to monitor the conduct of stakeholders in the supply chain and publish examples of good and illegal business practices, thereby supporting the establishment of fairer and more sustainable food systems (MKGP, 2025f).

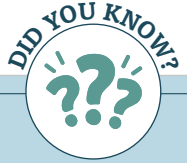
DID YOU KNOW?

In times of prosperity, consumers do not perceive food safety risks in the supply of domestic and imported food products. Risks increase when, by promoting special offers and prices, retail chains exert pressure on domestic food producers and suppliers. Under difficult market conditions, the latter then look for cheaper solutions by importing raw materials, cutting back on production, or switching to exporting. Consumers are thus forced to buy more and more food from distant regions, which can increase risks to the reliable supply of food in times of geopolitical or other crises.

Figure 32: Concentration in the food supply chain in Slovenia; rounded values for the average of 2022 and 2023



Source: Infographic design adapted from PBL (2014); data – AJPES, KIS, SURS, UVHVVR; calculations and infographic – KIS



What are quality schemes?

Quality schemes present agricultural products and foodstuffs that are distinguished by specific characteristics or properties. These characteristics may be related to the geographical origin, production and processing methods, traditional recipes and procedures, or prescribed quality. Quality schemes are voluntary and open to all interested producers of agricultural products and foodstuffs, and are marked with special labels, words, or symbols (MKGP, 2024c; MKGP, 2025d).

We can distinguish between European and national quality schemes. European quality schemes include: **protected designation of origin** (PDO; examples: Tolminc cheese, Karst honey, and extra virgin olive oil from Slovenian Istria); **protected geographical indication** (PGI; examples: Kranjska klobasa [Carniolan sausage], Ptujski lük [Ptuj onion], Štajersko-prekmursko bučno olje [Štajerska Prekmurje pumpkin seed oil]; **traditional speciality guaranteed** (TSG; examples: Prekmurska gibanica [Prekmurje layer cake], Idrijski žlikrofi [Idrija dumplings], Slovenska potica [Slovenian potica cake]); **optional quality terms for agricultural products and foodstuffs** (example: Mountain product); **and organic production and processing**.

The national quality schemes are: **selected quality–Slovenia**, **designation of higher quality**, and **integrated production**. Agricultural products and foodstuffs from quality schemes are produced in accordance with the procedures laid down in the regulations or product specifications, and their production is additionally controlled by authorized control and certification organizations.

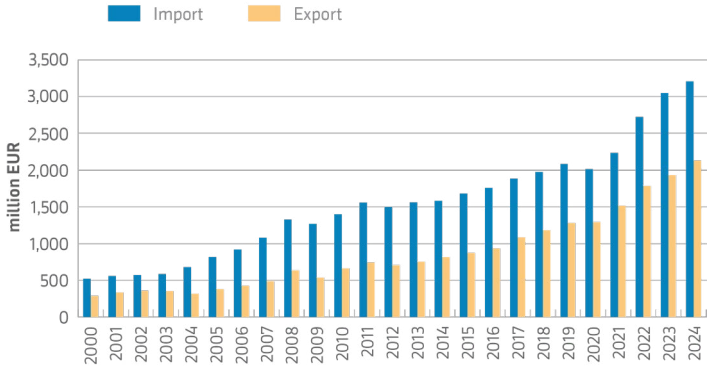
Slovenia, together with domestic food providers (producers and processors), also carries out activities to establish and recognize quality schemes and to strengthen the understanding of the importance of food sovereignty by offering food of local origin. Slovenia is also trying to encourage greater consumption of locally produced food by requiring the inclusion of local food providers in the **public procurement system** (green public procurement; Uredba ..., 2017).

4.3 SLOVENIA IS A NET FOOD IMPORTER

No country in the world relies solely on domestic production – Slovenia is no exception, as it is not entirely self-sufficient. Food imports are closely linked to factors such as the conditions for food production and processing (the natural conditions for agriculture, the seasonality of production, the presence of the food processing industry), economic conditions, trade agreements, political orientations, and consumer demand for certain types of food.

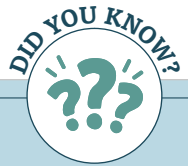
After Slovenia joined the EU, both imports and exports of food and beverages began to increase significantly, and this trend continues today (Figure 33). Since the total value of imports consistently exceeds exports, **Slovenia is classified as a net food importer**. The coverage of food imports by exports, which shows the export orientation of production, is around 60% (Indicator KM33).

Figure 33: Food and beverage imports and exports in Slovenia; 2000–2024



Note: Provisional data for 2024

Source: SURS

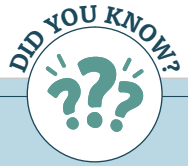


With less than 100% self-sufficiency, a country must import the products it is lacking (and thus is a net importer). Conversely, a country that produces more products than it needs usually exports its surplus (and thus is a net exporter). Food trade also takes place at 100% self-sufficiency if a country produces products that differ from those of another country or are not available in sufficient quantities in other countries (Revizijsko ..., 2021).

Price and other aspects are also important in international food trade. Slovenia imports large quantities of products that it is otherwise self-sufficient in, such as beef, poultry, and milk. Distributors and retailers often import cheaper food products, which sometimes only meet minimum quality standards, in order to increase profits. Consumers are also often guided by price when buying food, which is why imported products are often more attractive than domestic ones. Products that are in demand by consumers but for which Slovenia does not have the production or processing capacity are also imported. On the other hand, Slovenia exports products regarding which it is not fully self-sufficient (e.g. wheat), with the price that producers receive for their crops being the main guiding principle.

The coverage of import by export for food and beverages averaged 60% in the period before Slovenia joined the EU, and was higher for processed products (73%) than for unprocessed products (29%). This indicates that Slovenia exported more products with higher added value. After joining the EU, the coverage of import by export at the aggregate level decreased to an average of 48%. This was due to the intensive growth of imports, especially processed food and beverages, as the Slovenian food processing industry faced increased competition with the opening of borders. On the other hand, the ratio between imports and exports increased sharply in favour of exports of unprocessed products. In the period 2017–2021, both food and beverage imports and exports consistently increased (with the exception of imports in 2020 due to the impact of the COVID-19 pandemic), with exports growing slightly more intensely (Indicator KM33).

Slovenia is a net importer regarding most food groups. On average, the value of exports exceeded imports from when Slovenia joined the EU until 2021 only for trade in live animals, as well as for dairy products and eggs. This is also expected, as conditions for livestock farming are favourable in Slovenia, the degree of self-sufficiency in meat and milk is high, and surpluses are exported to foreign markets. For other product groups, Slovenia was a net importer in the period 2017–2021, but imports were still largely covered even for miscellaneous edible preparations (90%), beverages (86%), and meat and meat products (73%). The worst ratio is for foods that Slovenia does not grow or produce or does not produce in sufficient quantities to meet all domestic needs, namely fish and fish products (32%), vegetables and fruit (35%), and coffee, tea, cocoa, and spices (35%).



The increasing globalization of food supply chains brings both advantages and challenges. Imports enable greater diversity and availability of food throughout the year, but at the same time they lengthen the chain between food producers and consumers and raise numerous questions related to sustainability:

- Premature harvesting, forced ripening, and long transport distances reduce the quality of fresh produce.
- Imported food often requires more packaging to protect the products during transport. Transport routes are longer, which puts greater pressure on the environment, and there is also a greater need for storage and refrigeration, which increases the need for space and energy.
- Food imported from third countries may be produced according to less stringent standards in the areas of plant and animal health, hygiene, and the protection of the environment and human rights, which puts domestic producers and processors at an unequal position in the market.
- By purchasing imported food, especially cheap surpluses, consumers contribute to the deterioration of the economic situation of the domestic agricultural and food sector. According to estimates, the amount of food of foreign origin on the Slovenian market is increasing, while the share of food of domestic origin is decreasing (Indicator KM31). Food imported from countries where production is cheaper is displacing local food producers, as the latter find it difficult to compete on price due to their small size.
- Demand for food from poorer countries often leads to a deterioration in the socio-economic conditions of local food producers and the rest of the population, who find it increasingly difficult to access food due to their reduced purchasing power.

Before Slovenia joined the EU (2000–2003), a large part of foreign trade in food and beverages took place with the countries of former Yugoslavia, but then trade shifted considerably towards EU Member States. In the period 2017–2021, imports of food and beverages from the EU accounted for an average of 88% of total imports, while exports to EU countries accounted for 72% of the total export value. Slightly more than half of the value of trade takes place with neighbouring countries, with Italy and Croatia being the most important partners for both food and beverage imports and exports.

MYTH: **Slovenia imports large quantities of soybean for animal feed.**

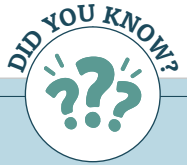
This is not true. Slovenia does not import soybeans for feed, but rather soybean meal. This is a by-product of soybean oil production and, apart from use in animal husbandry, has few alternative uses. As Slovenia is a transit country with important port and other transport infrastructure, most soybean meal is exported to other countries in the region. The remainder, i.e. the difference between imports and exports, is used as feed in poultry, pig, and cattle farming.

5 FOOD CONSUMPTION

Consumers are the last and largest link in the food supply chain. In addition to households, the HoReCa sector (hotels, restaurants, and catering), food preparation facilities in public institutions (preschools, schools, hospitals, etc.), and other facilities that prepare food are also included in final food consumers.

Foto © nasasuperhrana.si

Consumer food choices are primarily influenced by the food environment, which includes factors such as the physical availability, quality, safety, taste, price, and marketing (labelling, promotion) of food. The final choice of food depends on the consumer's purchasing power, preferences, and the time they devote to eating and nutrition-related knowledge. With their food choices, consumers also influence what kind of food the food system will produce (Global ..., 2016).



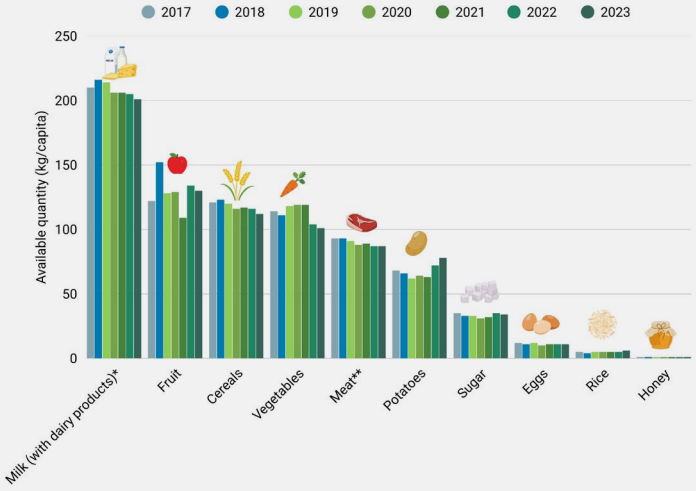
It is important that we, **as consumers, are aware of our rights and responsibilities**, including in the area of food. Consumers have the right to safe food, the right to information about food (e.g. food labelling), and the right to choose from a variety of foods. Our duty is to treat food with respect and in accordance with preparation instructions, and to reduce the amount of food waste. By changing our habits, we can all contribute to more sustainable food production and consumption (MKGP, 2025e).

Available quantity of basic agricultural products for consumption

The available quantity for consumption per capita, as shown in food balance sheets, indicates the quantities of basic agricultural products available to each resident for consumption at the wholesale level. This indicator does not show the quantities that an individual resident of Slovenia actually consumes, as this would require deducting all losses and changes in stocks that occur at the retail level (grocery stores that sell goods to consumers) and final consumers (households, food preparation facilities).

The availability of agricultural products for consumption varies between years, due to fluctuations in production and international trade. In the period 2017–2023, each resident of Slovenia had available annually an average of 118 kg of cereal (in grain form), 68 kg of potatoes (fresh and processed), 112 kg of vegetables (fresh and processed), 129 kg of fruit (fresh and processed), 33 kg of sugar, and 5 kg of rice (Figure 34). With regard to animal products, the average available quantity of meat was 90 kg (in carcass weight equivalent), milk together with dairy products 208 kg (in raw milk equivalent), eggs 11 kg, and honey 1 kg. Of the individual types of meat, pork predominates, with an average available quantity of 34 kg per capita, followed by poultry meat (32 kg/capita), and then beef (20 kg/capita). Other types of meat have less importance regarding food consumption in Slovenia.

Figure 34: The available quantity of agricultural products for consumption per capita (kg); 2017–2023



Notes: * In raw milk equivalent, ** In carcass weight equivalent

Source: KIS (milk), SURS

MYTHS & TRUTHS

MYTH: **Slovenians consume more meat than other residents of EU countries.**

This is not true. The amount of meat available per capita is often misinterpreted by the public as the amount that Slovenian residents actually consume. However, there is a significant difference between these two figures. The amount of meat available per capita shows how much meat in carcass weight (including bones) is available to each person at the wholesale level. In order to gain a closer look into the amount of meat consumed per capita, we would first have to subtract the weight of the bones, then subtract changes in stocks and meat losses in stores and among consumers (e.g. expired products, cooking losses, trimmings), and the amount of meat intended for pets.

By subtracting the weight of bones, the available quantities of meat per capita in Slovenia were calculated to be at a level comparable to OECD data for EU Member States and other developed countries (OECD, 2025). The calculations show that meat consumption in Slovenia is close to the EU average.

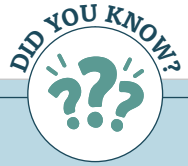
The economic accessibility of food

Statistical data shows that Slovenian households are allocating an increasing share of their expenditure to food and beverages (Indicator PG07). In 2022, households spent an average of around 17% of all expenditure on purchasing food and non-alcoholic beverages (Indicator PG06), which is slightly more than the EU average in the same year (according to Eurostat: 13%). Consumers' purchasing power fluctuates from year to year, which is also reflected in the fluctuations in food expenditure (between 2000 and 2022: 14–20%). Households with higher incomes spend more money, but the share of food and non-alcoholic beverages in their total expenditure is approximately 10%. Households with the lowest purchasing power spend the least on food, with the share of food and beverage expenditure accounting for more than 20% of their total expenditure (Indicator PG06).

Trends in food purchasing and consumption

With the modern lifestyle, consumers' shopping and eating habits have also changed. Data on the quantity of food and beverages consumed at home shows that the consumption of almost all major food groups in households decreased between 2000 and 2018, which can be attributed to more frequent dining out (Indicator PG07). Food shopping has become concentrated with providers of a wide range of goods, and shopping online is also increasing. The number of food stores has increased significantly, often built on the best agricultural land, either as independent units or as part of shopping centres. With this growth trend, Slovenia ranks among the top EU Member States in terms of retail space per capita (380 m²/1,000 inhabitants) (Florjančič, 2023).

A healthy diet is crucial to health, growth, development, and well-being, and supports an active lifestyle. It helps prevent nutrient deficiencies and excesses and various food-related illnesses. It is based on adequate, balanced, varied and moderate food choices (What ..., 2024). However, our eating habits are significantly influenced by the strong advertising of less healthy foods in various media, which encourages an unhealthy lifestyle. Overweight and obesity are also a major health problem in Slovenia, increasing year by year. According to data from 2019, a good third of adults (39%) were overweight, and a fifth (20%) were obese. Obesity is increasing most rapidly among the elderly, but also among children. According to health recommendations, the population of Slovenia consumes far too little vegetables (one-third of the recommended amounts), while fruit consumption is satisfactory (Indicator PG16). Between 2000 and 2018, the quantity of fish consumed per household also decreased by almost half (Indicator PG13).



In addition to choosing foods that are produced in a more sustainable way, consumers can also contribute to **reducing the environmental impact of the food system** by optimizing their purchases, choosing the means of transport they use to do their shopping, and using energy more efficiently for food preparation and refrigeration.

In Slovenia, there are numerous initiatives, projects, and measures that encourage consumers to eat Slovenian, locally produced food and to eat healthily, such as the „**Slovenian Food Week," the „Traditional Slovenian Breakfast," the „School Fruit, Vegetable, and Milk Scheme," the "Our Super Food" web portal, and the Delicacies of Slovenian Farms festival** (MKGP, 2023b; MKGP, 2025d; kgZS, 2025). Some consumers already recognize certain local agri-food products as high-quality, produced using environmentally friendly production systems, and making a positive contribution to the local economy and community as a whole.

In public institutions (schools, preschools, hospitals, nursing homes), the share of organic food must be at least 15% and the share of food from other quality schemes at least 20% (Uredba..., 2017). Compliance with legislative requirements is verified through inspections, which show that public institutions often have problems achieving the prescribed proportion of such food. Due to the lack of supply of organic food of Slovenian origin and higher purchase prices (the main factor in ordering is the price), imported organic food predominates (Akcijski ..., 2022). Remote branch schools and preschools in particular have problems finding interested local suppliers of food from quality and organic food schemes. Other problems include the questionable quality of organic products and a lack of staff to coordinate meal schedules and keep records of annual accounts in small schools and preschools (MKGP, 2025c).

6 FOOD WASTE

Food waste and other waste (e.g. packaging waste) are generated in all processes of the food system. These can have negative impacts on the environment, economy, and society, so proper management of such waste is also an important part of a (sustainable) food system.

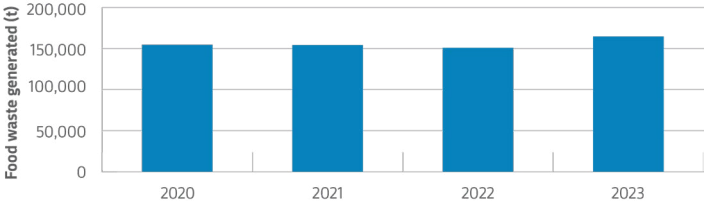
Foto © freepik.com

In Slovenia, food waste is defined as all food (raw or processed) and the remains of such food that are lost before food preparation, during the preparation process, or after it, and during food consumption. This includes food that is discarded during production, distribution, sale, and the provision of food-related services, and in households (SURS, 2024)[11].

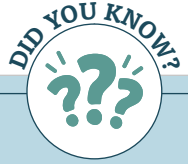
The reasons why food waste is generated in individual phases of the food system are numerous. At the level of the production, processing, distribution, and sale of food, the most common causes include unfavourable weather conditions, poor production planning, market conditions, losses during storage and transportation, improper inventory management, weak linkages, the use of inappropriate practices and technologies, the mishandling of food, damage to packaging, market standards, product recalls, lack of knowledge of use-by dates, and other factors (MKGP, 2021). Preventing and reducing food waste in these phases often requires technological and logistical improvements in processes. For consumers, the generation of food waste also reflects a lack of awareness and an appropriate attitude towards food.

In Slovenia, SURS monitors the quantities of food waste that end up in the waste management system. The purpose of such monitoring is to show the quantities of food waste generated by the origin and method of handling, based on which measures are developed and implemented for more sustainable food consumption. **In the period 2000–2023, an average of around 156,000 tons of food waste was generated annually in Slovenia** (Figure 35), of which approximately 75,000 tons was generated in households. Per capita, the average amount of food waste from households was 36 kg.

Figure 35: The quantity of food waste generated in Slovenia; 2020–2023



Source: SURS



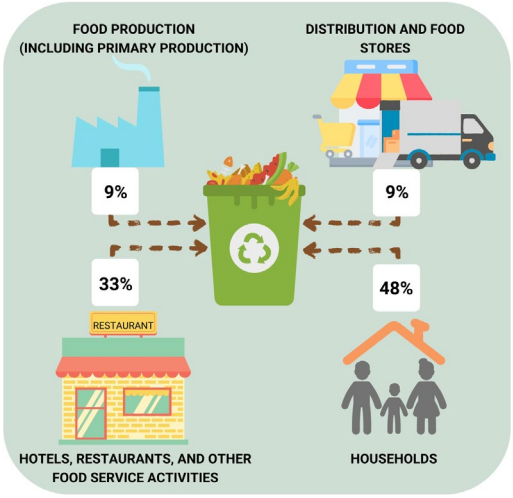
In Slovenia, the amount of food waste generated is small compared to other EU countries. On average in the 2020–2022 period, according to Eurostat data, Spain generated the least food waste per capita per year (67 kg), followed by Croatia (72 kg), and Slovenia (73 kg). The highest levels of food waste during this period were generated in Denmark (235 kg) and Cyprus (284 kg).

Food waste cannot be completely avoided, as it also includes bones, pits, peels, eggshells, husks, and similar items that are not suitable for consumption. According to estimates by the Statistical Office of the Republic of Slovenia (SURS), inedible waste accounted for 60% of the total amount of food waste in 2020 (MKGP, 2021). As consumers, we can make an important contribution to reducing the amount of edible food waste.

[11] Food waste does not include remains of food intended for processing into animal feed, food intended for humanitarian purposes, paper towels, napkins, and towels collected with organic waste, or packaging discarded together with food waste.

Most food waste (about half of the total quantity) originates in households, while a third originates from the restaurants and other establishments that serve food (e.g. schools, preschools, hospitals, nursing homes; Figure 36). About a fifth of food waste is generated at the stage of the production, processing, distribution, and trade in food.

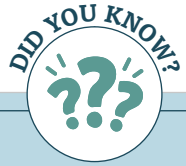
Figure 36: Food waste by source of origin; average 2020–2023



Note: Total does not add up to 100% due to rounding.

Source: Data – SURS; infographic – KIS

Food waste represents financial losses for actors, an unnecessary burden on the environment, and is also problematic from a social point of view, so many strategic documents, including at the level of Slovenia (e.g. the Strategy for reducing food loss and food waste in the food supply chain; MKGP, 2021), stipulate measures to solve this problem. The most important strategic measure is to prevent the generation of food loss, surpluses, and food waste in production and consumption. The next measure is to reduce the amount of food waste by the redistribution and use of surplus food, which also includes donating food and processing it into feed. As a last measure, proper management of food waste is stipulated (composting, biogas production, other processing methods).



In the food processing industry, all types of waste are recognized as an additional cost, so finding solutions for their alternative use is an ongoing process. For example, cake or meal left over from oil pressing or brewing can be used as animal feed, while animal by-products can be used in the pharmaceutical industry or leather production.

According to SURS data, on average between 2000 and 2023, **most food waste in Slovenia was composted** (41%), followed by processing in biogas plants (36%).

The establishment of standards to ensure food safety, and above all changes in shopping habits, have led to the introduction of different methods of food packaging, which has increased the demand for packaging and thus **the amount of packaging waste**. According to Eurostat data, the recycling rate for plastic packaging in the EU is less than half (around 40%), with the remainder being destroyed in incinerators. According to ARSO data, Slovenia is among the countries with the highest rate of plastic packaging recycling in Europe, at around 50% (in 2022: 51%).

7

HOW CAN A MORE SUSTAINABLE FOOD SUPPLY IN SLOVENIA BE ACHIEVED?

The transition to a sustainable food system is crucial for ensuring nutritious and affordable food, the health of people, the preservation of biodiversity and ecosystem services, and more stable economic conditions for all actors in the system.

Systems thinking, good knowledge of the advantages and limitations of the Slovenian space, a clear vision, and the coordinated action of the governance structures are some of the key factors necessary for the successful transformation of the current system.

Foto © Janko Verbič

On the path to a more sustainable food supply, Slovenia faces numerous specificities and challenges, which can also be seen as advantages in the transformation of the food system. The most important **advantages** of Slovenia include good use of permanent grassland, a favourable state of biodiversity, a diversity of food producers, and the potential to create new jobs. The key **limitations or challenges** include difficult production conditions (steep slopes, the karst terrain), the impact of climate change, weak linkages in the food supply chain, and heavy dependence on food imports.

A clear shared vision, a systemic approach, coordinated action by all involved actors, fairly distributed benefits, the burdens and costs of transformation, and regular monitoring of progress are the basis for effective transition to a sustainable food system. The existing governance structure could, with its strengthening, more effective connections, regular coordination, and the optimization of activities, achieve the goals of the shared vision and implement the transition to a sustainable food system, even without the establishment of new institutions/actors.

This will require the implementation of certain general systemic (intersectoral) steps, such as systemic support for sustainable practices, more effective adaptation to climate change, the creation of favourable conditions for investments, systemic innovations, the establishment of platforms for connecting stakeholders, strengthening the exchange of knowledge and good practices, ensuring food traceability, preventing unfair practices in the supply chain, raising consumer awareness, reducing food waste, and providing reliable data in order to monitor the achievement of goals.

The transition to a sustainable food system can bring numerous benefits, such as improved farming conditions, including for small farms and young transferees of farms, new jobs, more affordable and nutrient-rich food, more coordinated measures in various areas (e.g. agriculture, environment, health, and climate change), all of which will enable more effective achievement of common goals, reduced environmental pressures, and have positive effects on human health and the quality of life.

On the contrary, maintaining the existing system could lead to an increase in economic and social disparities, the abandonment of farming and the overgrowth of agricultural land, increased dependence on food imports, greater vulnerability to geopolitical uncertainties, reduced biodiversity, increased risk of soil degradation, and the endangering of water supplies due to growing irrigation needs. A major challenge for the future of Slovenian agriculture and society in general will also be how to address the demographic crisis, which will initially manifest itself in a significant shortage of labour, but also in the loss of the necessary farming knowledge.

The transformation of the food system requires the coordination of all policies, as without systemic, carefully considered, and long-term planned changes in many policies and areas, such as spatial planning, environmental protection, public procurement of food, the education system, public health, and consumer awareness, the desired transition cannot be realized (Poročilo ..., 2023).

Some proposals for these changes, by process and actor in the food system, are presented below. We believe that these proposals are among the most relevant and most urgently require implementation for the earliest possible sustainable transformation of the Slovenian food system.

HOW CAN A MORE SUSTAINABLE FOOD SUPPLY IN SLOVENIA BE ACHIEVED?

THE STATE AND LOCAL COMMUNITIES

- Permanent protection of agricultural land from construction, degradation, and overgrowth;
- Proactive resolution of the general demographic crisis and labour shortages in all sectors, not just agriculture (e.g. in education, healthcare, trade, and industry);
- Formulation of a common vision for land use and the food system;
- Coordinated intersectoral action and funding;
- Ensuring stable conditions for producers and other stakeholders in the food supply chain;
- Strengthening the public procurement system, with an emphasis on procuring food of Slovenian origin, incorporating additional criteria for prioritizing choices (alongside price);
- More transparent and efficient distribution of grants, and measurement of the impact thereof;
- More targeted support for strengthening agri-food chains and cooperation, organic farming, and other sustainable agricultural practices;
- Greater support for the development of short supply chains and direct sales (e.g. markets, boxed food deliveries, community and school gardens, sustainable tourism), for both consumers and caterers, as well as institutions that prepare food;
- Encouraging the development of innovative approaches and solutions in all segments of the food system;
- General simplification of administrative procedures and tax relief, especially for small (family) farms, lower taxes on basic foodstuffs;
- Raising consumer awareness of:
  - the benefits of eating seasonal food and the importance of supporting local producers, also through school programmes and campaigns,
  - responsible food handling and ways to reduce food waste,
  - healthy diets and limiting the marketing of unhealthy foods;
- Ensuring the transparency and understanding of quality schemes, and credible, correct, and expertly supported information;
- Intersectoral cooperation in creating and transferring knowledge, good practices, and innovations, and in managing relevant, high-quality, and possibly interlinked databases.

PRODUCTION

- Fostering good or improved agricultural and environmental conditions on agricultural land, and striving to preserve its production potential;
- Generational renewal in agriculture;
- Investment in and implementation of climate change adaptation measures (e.g. irrigation, the use of more resistant crop varieties, anti-hail nets);
- The use of new and sustainable production and rearing technologies, regular education and training in the field of new technologies;
- Improving animal welfare;
- Networking with other agricultural producers and actors in the supply chain, in terms of purchasing production inputs, as well as selling products.

PROCESSING AND PACKAGING

- More effective linkage with local producers;
- Strengthening food processing, especially regarding fruit and vegetables;
- Finding solutions to reduce food and packaging waste;
- More efficient use of energy in processing and packaging processes;
- The introduction of innovative products;
- Packaging food in environmentally friendly, biodegradable packaging;
- The digitization of product traceability throughout the entire food chain (e.g. by means of barcodes).

DISTRIBUTION AND SALES

- Preventing unfair trading practices;
- A more efficient and warehouse-supported distribution network among producers and buyers;
- Finding more efficient logistical solutions to reduce the carbon footprint of distribution;
- Changes in the supply and price policies of wholesale and retail conglomerates (e.g. priority in terms of the presence and range of food products of Slovenian origin);
- Developing innovative marketing strategies (e.g. tastings, stories about producers, promotional campaigns).

CONSUMPTION

- Strengthening awareness of the holistic impacts of food choices on health, the environment, society, and the economy;
- More frequent purchases of seasonal and locally produced food;
- Ensuring a balanced and healthy diet;
- Reducing food waste by avoiding excessive shopping and more efficient meal planning;
- Buying food with less packaging waste.

8 | GLOSSARY OF KEY TERMS

Agricultural land – land intended for agricultural activities on which agricultural crops are grown for human consumption, animal feed, or as raw materials for industrial processing. Agricultural land is divided into arable land, meadows, pastures, or permanent crops (Bernik et al., 2025).

Agri-food industry (or agri-food chain) – the entire set of activities within the food supply chain. It includes agriculture, food processing and beverage production, food retail and catering services, as well as suppliers of inputs and services (e.g. seeds, fertilizers, packaging, and transport) (EC, 2025a).

Area facing natural or other specific constraints (ANC) – an area where various natural factors (e.g. terrain configuration, higher altitude, bora) make agricultural production more difficult, which increases production costs compared to areas without these factors (Bernik et al., 2025).

Biodiversity (or biological diversity) – the comprehensive variety of life on Earth, from microorganisms, fungi, and plants to animals. This includes diversity within species, between species, and the diversity of ecosystems inhabited by living organisms (FAO, 2025).

Ecosystem services – all the benefits that ecosystems provide to people. They are divided into provisioning services (e.g. food, water, and fibre supply), cultural services (e.g. recreational space), and regulating services (e.g. climate and flood regulation) (Bennett et al., 2009).

Food (or foodstuff) – any substance or product, whether processed, partially processed, or unprocessed, intended for human consumption. Food also includes beverages, including water (Uredba ..., 2002).

Food chain (also food supply chain) – a linear or circular sequence of activities from the production to the consumption of food (including food waste management) (Parsons et al., 2019).

Food security – a state in which all people have constant physical and economic access to sufficient quantities of safe and nutritious food that meets their dietary needs and preferences for maintaining an active and healthy life (FAO, 1996).

Food system (also agri-food system) – all elements and activities related to the production, processing, distribution, preparation, and consumption of food (EEA, 2025b). The food system comprises food supply chains, numerous actors (individuals, organizations, and institutions), driving forces, and resulting outcomes, all of which are interconnected in complex networks (Parsons et al., 2019).

Food waste – "raw or processed food and remains of this food lost before, during, or after food preparation or during food consumption, including food discarded during production, distribution, sale, and implementation of food-related services and in households" (SURS, 2024).

Local production – food production characterized by a short chain from producer to consumer. Due to the shorter distances, the agricultural products retain higher biological and nutritional value, and the carbon footprint of transport is also lower (Bernik et al., 2025).

Organic farming – a certified method of farming that takes into account the biological principles of crop production and animal welfare requirements, reduces the consumption of energy and materials from non-renewable sources, has a lower negative impact on the environment, and can offer food of above-standard quality (Bernik et al., 2025).

Overgrowing/Abandonment – the natural process of agricultural land being overgrown with woody plants due to the absence of human cultivation. Overgrowth is caused by natural, socio-economic, and institutional factors (Bernik et al., 2025).

Self-sufficiency rate – the share of domestic production of agricultural products in relation to total domestic consumption (consumption for feed, food, and industrial use). A self-sufficiency rate below 100 indicates a deficit, while a rate above 100 indicates a surplus in domestic production (SURS, 2023).

Soil degradation – the deterioration of soil properties, leading to a reduction in the provision of soil functions and ecosystem services. Degradation manifests itself, for example, in reduced soil depth, lower humus content, increased compaction, deteriorated soil structure, and a decline in biodiversity (Bernik et al., 2025).

Sustainability – according to the Brundtland Commission of the United Nations, this is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs (UN, 2025b).

Sustainable (agri-)food system – a comprehensive and integrated system from food production to food waste management, which simultaneously ensures the economic, environmental-climate, and social aspects of sustainability in all parts of the system in order to guarantee food security and sovereignty for current and future generations (Predlog ..., 2025).

Sustainable development – development that is consistent with the principles of sustainability and coordinates three key elements essential for human well-being: economic growth, social inclusion, and environmental protection (UN, 2025a).

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- [KM01] Use of plant protection products: https://kazalci.arso.gov.si/en/content/use-plant-protection-products-0
- [KM02] Consumption of mineral fertilisers: https://kazalci.arso.gov.si/en/content/consumption-mineral-fertilisers-2
- [KM03] Areas of land with agri–environmental measures: https://kazalci.arso.gov.si/en/content/areas-land-agri-environmental-measures-2
- [KM04] Intensity of agriculture: https://kazalci.arso.gov.si/en/content/intensity-agriculture-1
- [KM05] Share of agricultural land with high natural value: https://kazalci.arso.gov.si/en/content/share-agricultural-land-high-natural-value
- [KM06] Nature areas under protection and agriculture: https://kazalci.arso.gov.si/en/content/nature-areas-under-protection-and-agriculture-2
- [KM07] Farmers' training levels: https://kazalci.arso.gov.si/en/content/farmers-training-levels-2
- [KM08] Areas of land with organic farming: https://kazalci.arso.gov.si/en/content/areas-land-organic-farming-3
- [KM10] Land use change and agriculture: https://kazalci.arso.gov.si/en/content/land-use-change-and-agriculture-3
- [KM11] Production methods on agricultural holdings: https://kazalci.arso.gov.si/en/content/production-methods-agricultural-holdings-1
- [KM12] Specialisation and diversification of agriculture: https://kazalci.arso.gov.si/en/content/specialisation-and-diversification-agriculture-1
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- [KM25] The phosphorous budget in agriculture: https://kazalci.arso.gov.si/en/content/phosphorous-budget-agriculture
- [KM26] Plant nutrient content in agricultural topsoils: https://kazalci.arso.gov.si/en/content/plant-nutrient-content-agricultural-topsoils
- [KM27] Agricultural area - arable land per capita: https://kazalci.arso.gov.si/en/content/agricultural-area-arable-land-capita-1
- [KM29] Food self-sufficiency: https://kazalci.arso.gov.si/en/content/food-self-sufficiency-1
- [KM31] Structure of food imports: https://kazalci.arso.gov.si/en/content/structure-food-imports?tid=1
- [KM33] Coverage of food imports by food exports: https://kazalci.arso.gov.si/en/content/coverage-food-imports-food-exports-0?tid=1
- [KM34] The concentration of agricultural production: https://kazalci.arso.gov.si/en/content/concentration-agricultural-production-0
- [NV01] Nature areas under protection: https://kazalci.arso.gov.si/en/content/nature-areas-under-protection-1
- [NV02] Protected areas: https://kazalci.arso.gov.si/en/content/protected-areas-10
- [NV03] Natura 2000: https://kazalci.arso.gov.si/en/content/natura-2000-2
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- [PG06] Household expenditure: https://kazalci.arso.gov.si/index.php/en/content/household-expenditure-2
- [PG07] Food: https://kazalci.arso.gov.si/en/content/food-1
- [PG13] Food consumption – animal based protein: https://kazalci.arso.gov.si/index.php/en/content/food-consumption-animal-based-protein-0

- [PG16] General health status according to the type of food consumed and according to household income: https://kazalci.arso.gov.si/index.php/en/content/general-health-status-according-type-food-consumed-and-according-household-income
- [PP14] Agricultural droughts: https://kazalci.arso.gov.si/en/content/agricultural-droughts-1
- [SE08] Ecological footprint: https://kazalci.arso.gov.si/en/content/ecological-footprint-5
- [TP03] Land take: https://kazalci.arso.gov.si/en/content/land-take-1
- [TP06] Land cover and land use in water protection areas: https://kazalci.arso.gov.si/en/content/land-cover-and-land-use-water-protection-areas-0
- [VD16] Water protection areas: https://kazalci.arso.gov.si/en/content/water-protection-areas-1

9.2 STATISTICAL AND OTHER DATA

Statistical data (available as of 20. 3. 2025)

Statistical Office of the Republic of Slovenia (SURS)

Data releases under the theme Agriculture, Forestry and Fishing, sub-theme:

- Economic accounts for agriculture. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?economic-accounts-for-agriculture%23104%23104#104
- Farms and Agricultural census. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?farms-and-agricultural-census#102
- Supply balance sheets. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?supply-balance-sheets#105
- Production methods in agriculture, Organic farming. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?production-methods-in-agriculture#106
- Crop production. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?production-methods-in-agriculture#103
- Fishery and aquaculture. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?fishery-and-aquaculture#108
- Livestock, milk and milk products. https://pxweb.stat.si/SiStat/en/Podrocja/Index/85/kmetijstvo-gozdarstvo-in-ribistvo/?livestock-milk-and-milk-products#86

Data releases under the theme Environment, sub-theme:

- Waste, Food waste. https://pxweb.stat.si/SiStat/en/Podrocja/Index/99/okolje/?food-waste#372

Data releases under the theme Population, sub-theme:

- Population number and structure. https://pxweb.stat.si/SiStat/en/Podrocja/Index/100/prebivalstvo/?population-number-and-structure#129

Data releases under the theme Trade and services, sub-theme:

- Exports and imports of goods, Classification by broad Economic Categories (BEC). https://pxweb.stat.si/SiStat/en/Podrocja/Index/141/trgovina-in-storitve/?classifi-cation-by-broad-economic-categories-#469
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Eurostat

Eurostat Database. Data releases under the theme Agriculture, forestry and fisheries, Environment and Energy, Economy and finance. https://ec.europa.eu/eurostat/data/database

Other data

AJPES

Information on the operations of companies in the field of manufacturing in the Republic of Slovenia. Ljubljana, Agencija Republike Slovenije za javnopravne evidence in storitve.
https://www.ajpes.si/Letna_porocila/Splosno (Accessed 3. 7. 2025)

ARSO

Data on packaging and packaging waste for 2022. Ljubljana, Ministrstvo za okolje in prostor, Agencija Republike Slovenije za okolje.
http://www.arso.si/varstvo%20okolja/odpadki/poro%c4%8dila%20in%20publikacije/EMB%20in%20OE%202022%2c%20okoljski%20cilji.pdf
(Accessed 3. 7. 2025)

GOZDIS

OSLIS information system. Data on game harvesting in Slovenia. Ljubljana, Gozdarski inštitut Slovenije.
https://oslis.gozdis.si/ (Accessed 3. 7. 2025)

KIS

Ljubljana, Kmetijski inštitut Slovenije.

- Balance of the production and consumption of milk and dairy products
- Reports on the State of Slovenian Agriculture, Food, Forestry and Fisheries

MKGP

Ljubljana, Ministrstvo za kmetijstvo gozdarstvo in prehrano Republike Slovenije.

- Record of the current use of agricultural and forest land by type of actual use
- Data on the area of agricultural land in use in areas with limited possibilities for agricultural activity
- Data on changes in the intended use of agricultural land and changes in intended non-agricultural uses of agricultural land by municipality, according to the Municipal Spatial Plans

MKGP/ARSKTRP/MF

Budget breakdown by budget item and purpose (internal data). Ljubljana, Ministrstvo za kmetijstvo gozdarstvo in prehrano, Agencija Republike Slovenije za kmetijske trge in razvoj podeželja, Ministrstvo za finance.

MOPE

Spatial Information System, Collection of Spatial Acts. Ljubljana, Ministrstvo za okolje, prostor in energijo.

UVHVVR

Ljubljana, Uprava Republike Slovenije za varno hrano, veterinarstvo in varstvo rastlin.

- Data on the number of bee colonies
- Data on the number of markets
- Data on the number of food stores by individual retail chain

ZZRS

Fisheries Cadastre. Ljubljana, Zavod za ribištvo Slovenije.
https://www.zzrs.si/ (Accessed 3. 7. 2025)