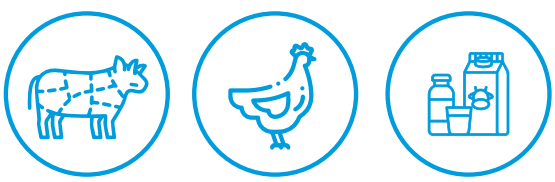
Funded by
the European Union

MINISTERUL AGRICULTURII ȘI
INDUSTRIEI ALIMENTARE
AL REPUBLICII MOLDOVA

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ANALYSIS OF THE CAPACITIES OF NQIS INSTITUTIONS AND THE DEMAND FOR THEIR SERVICES FROM THE MEAT, POULTRY AND DAIRY VALUE CHAINS IN THE REPUBLIC OF MOLDOVA



Assignment Title:	Analysis of the capacities of NQIS institutions and the demand for their services from the meat, poultry and dairy value chains in the Republic of Moldova
Project Title:	Improving the standards compliance through increased national capacities for residue monitoring
Project No.:	EU Project Number: 442-003 UNIDO SAP ID: 220009
Country:	Republic of Moldova

Disclaimer

Contents

Abbreviations

AIPA	The Agency for Intervention and Payments in Agriculture
ANSA	National Food Safety Agency
ASF	African Swine Fever
BIS	Business Intelligent Services SRL
BSE	Bovine Spongiform Encephalopathy
CAB	Conformity Assessment Body
CP	Country Programme
CRDV	Republican Center for Veterinary Diagnostics
cwe	carcass weight equivalent
DCFTA	Deep and Comprehensive Free Trade Agreement
DG SANTE	Directorate-General for Health and Food Safety of the European Commission
EC	European Commission
EFSA	European Food Safety Authority
ESSPP	Environmental and Social Safeguards Policies and Procedures
EU	European Union
FADN	Farm Accountancy Data Network
FAO	Food and Agriculture Organization of the United Nations
FBOs	Food Business Operators
FDP	Fresh Dairy Products (FDP)
INM	National Institute of Metrology
ISID	Inclusive and Sustainable Industrial Development
LIMS	Laboratory Information Management System
MAFI	Ministry of Agriculture and Food Industry
MDED	Ministry of Economic Development and Digitalization
MOLDAC	National Accreditation Centre of the Republic of Moldova
MRL	Maximum Residue Levels
MS	MS Member State to add
Mt	Million metric tons
NARDS	National Agriculture and Rural Development Strategy
NBS	National Bureau of Statistics
NRMP	National Residue Monitoring Plan
NQIS	National quality infrastructure system
NTM	Non-tariff measures
QI	Quality Infrastructure
RASFF	Rapid Alert System for Feed and Food
RSA	The State Register of Animals (RSA)
rwe	retail weight equivalent
SDG	Sustainable Development Goals
SMEs	Small and medium enterprises
SMP	Skim Milk Powder
STSA	Territorial Subdivision of Food Safety Agency (ANSA regional units)
TRACES NT	Trade Control Expert System - New Technology
UNIDO	United Nations Industrial Development Organization
UNSDCF	United Nations Sustainable Development Cooperation Framework
WMP	Whole Milk Powder

Executive Summary

This study presents the outcomes of the "Analysis of the capacities of NQIS institutions and the demand for their services from the meat, poultry, and dairy value chains in the Republic of Moldova".

The study aims to enhance understanding of the capacities within the National Quality Infrastructure System (NQIS) in the Republic of Moldova. It specifically focuses on assessing the needs and demands for services in the meat, poultry and dairy product sectors, while identifying and evaluating any existing gaps. The insights derived from this study will inform the development and refinement of an action plan and roadmap, contributing to tailored support for the Republic of Moldova to fulfil the provisions of the DCFTA.

The study was mandated to Moldovan Consulting Company Business Intelligent Services (BIS) by the "Improving the standards compliance through increased national capacities for residue monitoring" project, implemented by the United Nations Industrial Development Organization (UNIDO).

The study took place from July to November 2023 and was conducted by a team of local experts, led by an international Team Leader with extensive expertise in food safety, quality management, agricultural value chains, and trade. BIS - a consulting company based in the Republic of Moldova, provided leadership for the assignment.

Based on detailed terms of references, the present study covers the following topics:

1. Analysis of the global and EU market trends for meat, poultry, and dairy products.
2. Identification of relevant standards and regulations in different markets with an emphasis on EU market requirements.
3. Assessment of national capacities of meat, poultry, and dairy production in the Republic of Moldova.
4. Detailed mapping and performance analysis of the NQIS institutions.
5. Identification of Leverage points and recommendations.

The main sources of information were literature, research team expertise and expert interviews. Overall, 47 interviews were conducted with representatives of different ministries/agencies, laboratories, FBOs. Towards the end of the study, feedback was collected from 30 stakeholders in the frame of a validation workshop organized by UNIDO.

The bottom-line is straight forward: entry into the EU market, or any other high-end market. Inclusion on the EU exporter list will economically benefit certain businesses and will serve as a powerful leverage for the distribution of highly technical knowledge and skills-creation of jobs and development of the skilled workforce. Hence, developing and expanding the capabilities of the national food safety system where ANSA is playing the key role, and assisting the Moldovan FBOs and other enterprises in gaining access to the EU market is crucial.

Thus, proper development of required QI with a particular focus on residue monitoring in animal feed and products of animal origin for achieving compliance with the EU requirements and standards will boost the development of private and public services in the fields of laboratory equipment calibration, certification and maintenance services, etc. Close cooperation of the public and private sectors, and the joint effort will contribute to Moldova's economic growth not only in the agri-food sector but also for the sectors involved in the provision of required support services.

The present study aims to contribute to the UNIDO Project "Improving the standards compliance through increased national capacities for residue monitoring" by providing specific, relevant and feasible recommendations of high priority and with substantial leverage that have a fair chance to significantly improve conformity capacities in Moldova in the long run.

Recommendations 1 to 8 address the following:

1. Strengthening institutional capacities in the process of harmonization and implementation of the EU requirements;
2. Effective enforcement of official control at central and regional levels;
3. Strengthening the coordination of the Labs in the country (Technical Committee or association);
4. Increasing the financial means for investments and operational improvements for laboratories;
5. Management and availability of human resources (laboratory specialists);
6. Consolidation of laboratory-client relations;
7. Support programs in implementing quality standards and EU regulations;
8. Involvement of Business Associations and FBOs in the negotiation process of the EU integration

While UNIDO's commitment to this Project may lead some to think that such change is relevant only in terms of contributing to an increase in exports, it will also work towards increased food safety on the domestic market.

Thus, the enforcement of legislation in line with EU regulations and, with it, the much-needed, increased testing will benefit Moldovan consumers. The focus on exports through the lens of QI also needs to be understood as both an essential driver of and contributor to safer food and improved livelihoods in all of Moldova.

Introduction

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes Inclusive and Sustainable Industrial Development) for poverty reduction, inclusive globalization and environmental sustainability. The mandate of UNIDO is to promote and accelerate inclusive and sustainable industrial development in developing countries and economies in transition. UNIDO's vision is a world where economic development is sustainable and economic progress is equitable.

"Improving the standards compliance through increased national capacities for residue monitoring" is one of the projects implemented by UNIDO. The overall objective of this Action is to enhance national consumer safety and access to safe, healthy and nutritious food and to improve trade opportunities and create a conducive business environment for SMEs, thus contributing to resilient, sustainable, and inclusive economic development as well as paving the way to a fully-fledged Green Deal for the Republic of Moldova.

The specific objective of the Action is to increase national capacities for residue monitoring in animal feed and products of animal origin (pesticides, veterinary medicine, contaminants and prohibited substances).

The Action pursues three technical Outcomes, thus responding to the limited capacity for residue monitoring and the main compliance challenges identified in the Republic of Moldova:

> Outcome 1: Improved practices of competent authorities (ANSA and MAFI) through good governance and revamped legal and regulatory framework.
> Outcome 2: Improved practices of national reference laboratories through expanded testing capacities, demonstrating proof of compliance.
> Outcome 3: SMEs and FBOs application of best practices in compliance with standards and technical regulations in the value chains of meat, poultry and milk products are enhanced.

The Action is proposed in line with the European Green Deal and the Farm2Fork strategy and will contribute to the accomplishment of the 2nd General Objective of the National Agriculture and Rural Development Strategy (SNDAR) 2023-2030 "Development of the food industry and diversification of markets", and the Food Security Strategy of the Republic of Moldova for 2023-2030 and will promote SDG 2, SDG 9, and SDG 12.

The Action is jointly executed by ANSA and MAFI as main beneficiaries, and UNIDO, in close cooperation with the EU Delegation to the Republic of Moldova and a number of other partners from public institutions, private sector and civil society.

The European Union (EU) is Moldova's biggest trade partner, accounting for 49.3% of its total trade in 2022. Around 59% of Moldovan exports are destined for the EU market. Moldova ranks 65th among the EU's trade partners, with a total turnover of around EUR 7.2 billion in 2022, an increase of about 44% from 2021. By signing the Deep and Comprehensive Free Trade Agreement (DCFTA) with the EU in 2014, with full effect since July 2016, the Republic of Moldova has opened additional opportunities to increase agri-food exports.

Once, on 14 December 2023, the European Council decided to open accession negotiations with Moldova; the aim is to negotiate the chapters of the various policy areas. The aim is the complete adoption of the acquis Communautaire of the EU (the "acquis"), meaning the adoption or integration of EU legislation into national law. Chapters 11 (agriculture and rural development) and 12 (food safety) are particularly relevant to this agricultural policy dialogue project. In its analysis, the European Commission reported in February 2023 (EC 2023) on the progress of Moldova's alignment with the EU. It mentions the following regarding chapters 11 and 12:

European Commission on Chapter 11 (Agriculture and Rural Development):

- Moldova and the EU have already largely liberalized their mutual trade in agricultural products;
- Moldova has developed a national strategy for agricultural and rural development aimed at alignment with the Common Agricultural Policy;
- MAFI is the competent national authority. The Agency for Intervention and Payments in Agriculture (AIPA) is responsible for financial management;
- Data quality must be improved and process efficiency increased. A Farm Accountancy Data Network (FADN) will need to be developed.

European Commission on Chapter 12:

- Food safety, veterinary and phytosanitary policies are covered in Chapter 4 of the DCFTA. For "Sanitary and Phytosanitary Measures" (SPS), the DCFTA provides for 235 EU acts to be aligned by Moldova. Of these, Moldova has fully aligned 153, partially aligned 7, not aligned 68, and another 7 are no longer in force;
- The authorities responsible for this policy area are MAFI and the National Agency for Food Safety (ANSA);
- The successful implementation of sanitary and phytosanitary regulatory measures has opened EU markets for several Moldovan products in the animal and plant health sectors;
- Monitoring and enforcement in areas such as animal health and welfare, biosecurity, food safety and traceability of products need to be improved;
- National legislation and implementing regulations for exports to the EU are generally in line with EU requirements, although due to the lack of efficiency of the monitoring system, the competent authorities and the lack of diagnostic tools have proven unable to provide the required level of guarantees for all animal products;
- In the area of general food safety, food safety regulations and specific regulations for feed, Moldova has been working on strengthening its administrative capacity. The EU has authorized Moldova to export honey and caviar and, from 2021, dairy products that have undergone health treatment, egg products, certain fishery products, snails, gelatin and collagen from poultry meat.

This report presents the outcomes of the "Analysis of the capacities of NQIS institutions and the demand for their services from the meat, poultry, and dairy value chains in the Republic of Moldova". The objective of the study was to carry out an in-depth analysis of the capacities of the institutions forming NQIS in the Republic of Moldova (supply side study). At the same time assessing the need and the demand for those services from the meat, poultry and dairy value chains with a focus on quality, food safety, environmental, social, sustainable and organic requirements and its compliance infrastructure. The study also analyses the relevant EU market requirements for the selected value chains, focus on an analysis of laboratories' capacities to test microbiological indicators, contaminants, residues and time and cost implications and analyses self-control mechanisms by FBOs.

The present study comprised the following tasks:

- Identify the relevant EU market requirements and corresponding demand-driven quality-related services for live animals and products of animal origin with a focus on meat, poultry and dairy products value chains;
- Identify the existing capabilities, and needs of the national QI system in the Republic of Moldova along the entire value chains of meat, poultry and dairy product;
- Collect the fundamental statistics on live animals and products of animal origin with a focus on meat, poultry and dairy product value chains, including key sector indicators;
- Analyse and map business support institutions and the private sector. Outline the compliance capacity needs and challenges stemming from the private sector actors to strengthen the capacity of FBOs along the value chain to comply with EU and international market requirements;
- Identify leverage points for the actors in the value chains of meat, poultry and dairy with a particular focus on FBOs and the conformity assessment bodies, ANSA, MAFI;
- Outline gaps in the national compliance infrastructure and recommend actions to close related gaps.

The study is structured as follows:

1. Analysis of the global and EU market trends for meat, poultry, and dairy products;
2. Identification of relevant standards and regulations in different markets with an emphasis on EU market requirements;
3. Assessment of national capacities of meat, poultry, and dairy production in the Republic of Moldova;
4. Detailed mapping and performance analysis of the NQIS institutions;
5. Identification and selection of priority products;
6. Leverage points and recommendations.

This study has been prepared according to various tools and methodologies for conducting an in-depth analysis of quality infrastructure, developed by UNIDO, and by the team of the researchers from BIS: Mr Valeriu Lazar, Project Director, Ms Aušra Išarienė, Project Team Leader, Ms Tatiana Nistorica, Key Expert, and Mr Vlad Furdui, Key Expert. The study has been prepared under the direct supervision and guidance of the UNIDO Project team: Mr Giorgi Todua, Associate Industrial Development Expert, Ms Lali Madzgarashvili, International Quality Infrastructure and Food Safety Expert, and Ms Dona Scola, National Project Coordinator.

Methodology

The study was based on a solid methodological framework that combined both quantitative and qualitative methods. By combining quantitative and qualitative research methods, the study provides a sound understanding of the problems and opportunities faced by NQIS institutions and actors from the meat, poultry, and dairy value chains in the Republic of Moldova. Blending the two methods together also helped to ensure that the data collected and analysed was more reliable and valid.

Table 1 provides an overview of the study's structure and methodology. Overall, six topics were covered, and the main sources of information were literature, expertise, and expert interviews.

Overall, 47 interviews were conducted with representatives of different ministries/agencies, laboratories, associations and FBOs. The detailed list of interviews can be found in Annex 1.

Targeted questionnaires for laboratories, business associations and FBOs were prepared, covering meat, poultry, and dairy value chains in the Republic of Moldova. Thus, 4 laboratories, 7 Associations and 39 FBOs from 20 districts participated in the surveys, by sharing valuable information and insights.

Towards the end of the study, feedback was collected from around 30 stakeholders in the frame of a Validation workshop which was organized by UNIDO on 26 October 2023.

Table 1. Overview of the study structure and methodology

Topic	Chapter	Methodology
Analysis of the global and EU market trends for the meat, poultry, and dairy products	1	Literature review (main sources: FAOSTAT, Eurostat, OECD-FAO Agricultural Outlook Reports, EU Commission data and reports);
Standards and regulations in different markets with an emphasis on EU market requirements	2	Literature review (main sources: EC, EUR-Lex, DCFTA Moldova, legis.md);
Assessment of national capacities of meat, poultry, and dairy production	3	Literature review (main sources: UNComtrade, FAOSTAT, NBS, ANSA, AIPA, etc.);
Detailed mapping and performance analysis of the NQIS institutions	4	Literature review, expert interviews, knowledge and experience of team members, dedicated questionaries;
Identification and selection of priority products	5	Literature review, expert interviews, knowledge and experience of team members;
Leverage points and recommendations	6	Combination of findings from previous topics (chapters 1-5) plus feedback from a stakeholder workshops.

1.

Analysis of the global and EU market trends for the meat, poultry, and dairy products

1.1 Meat

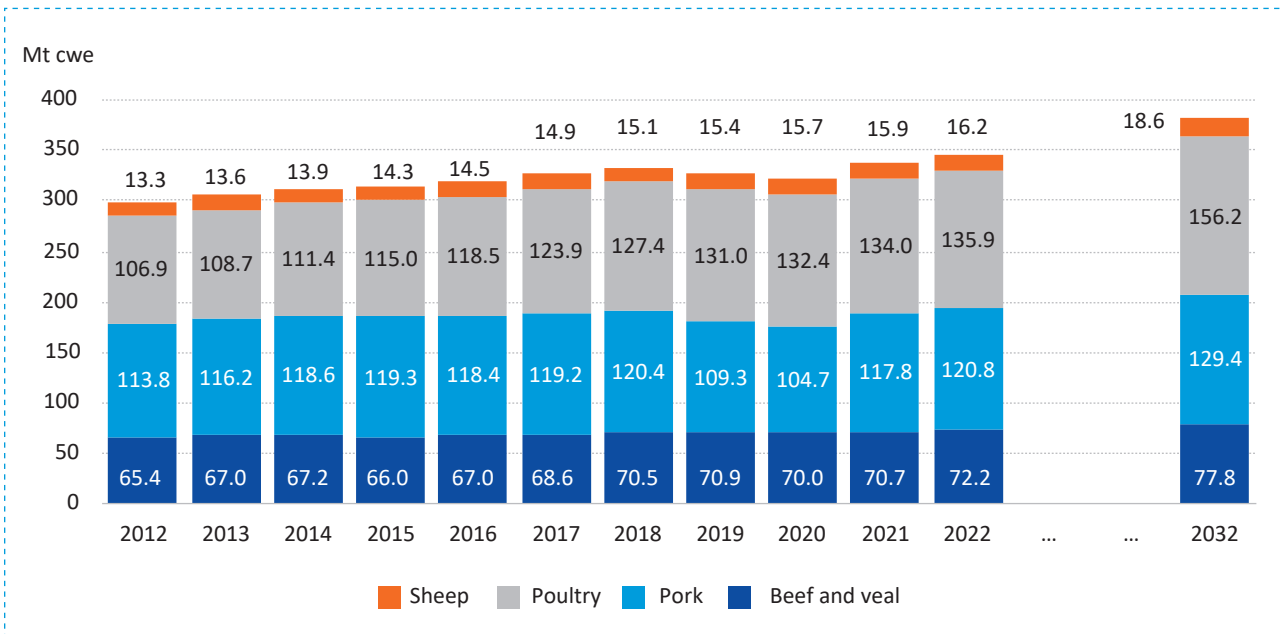
This chapter describes market developments and medium-term projections for world meat markets for the period 2023-2031/2032. Market developments and projections cover consumption, production, trade and prices for beef and veal, pigmeat, poultry, and sheep meat.

1.1.1 Production. Trends. Leading Countries.

World total meat production[1] reached 345.2 million tons in carcass weight equivalent (cwe) in 2022, up 2 percent from 2021.

Since 2016, poultry has emerged as the primary category of meat produced globally. In 2022, the share of poultry meat in total meat production reached 39%, surpassing other meat categories. Pork meat accounted for 35% of global meat production, beef and veal for 21%, and sheep meat represented a smaller share at 5%. This shift reflects changing consumer preferences, the efficiency of poultry production, and the increasing demand for poultry meat around the world.

Figure 1. Global meat production by meat type, 2012-2022 & projections for 2032



Source: OECD/FAO

The United States, China, Brazil, and the European Union are prominent players in the global production of poultry, pork, beef, and veal meat. These countries and regions have significant livestock industries and are major contributors to the world's meat production.

Additionally, China is the largest producer of sheep meat, further highlighting its significant role in the global meat industry. These countries and regions often have well-established agricultural sectors, advanced technology, and infrastructure to support large-scale meat production, making them dominant players in the global market.

The European Union (EU) indeed holds a significant and leading position in the global meat production industry. The EU is known for its advanced agricultural practices, stringent quality standards, and a diverse range of livestock production. It plays a central role in the production of various types of meat, including poultry, pork, beef, and veal.

This has allowed the EU to not only meet its own domestic meat demand but also to be a major exporter of meat products to international markets. The EU's presence in the global meat production industry underscores its importance in the agricultural and food sectors worldwide.

1. This refers to the total volume of meat derived from bovine, pig, poultry and ovine, in carcass weight.

Figure 2. TOP 10 global meat producers by meat type, 2022 (Mt cwe)

Rank	Beef and veal		Pork		Poultry		Sheep	
1	US	12,159	CN	52,000	US	22,797	CN	5,083
2	BR	9,126	EU	23,866	CN	21,771	IN	856
3	EU	7,091	US	12,153	BR	14,818	PK	779
4	CN	6,926	BR	4,451	EU	13,621	AU	735
5	AR	3,191	RU	4,434	RU	4,589	EU	638
6	IN	2,601	VN	3,794	IN	4,301	NZ	448
7	PK	2,441	CA	2,203	ID	4,090	NG	423
8	AU	2,265	MX	1,689	MX	3,705	IR	365
9	MX	2,074	KR	1,373	TR	2,347	UK	300
10	RU	1,644	JP	1,300	IR	2,307	ET	290

Source: OECD/FAO & authors calculations

Share of quantity of EU meat production (%, 2021)

In 2021, 23.4 million tons of pigmeat were produced within the EU, a moderate rise in 2020 (1.6 %) to a new peak. An estimated 13.2 million tons of poultry meat were produced, almost twice as much as the production quantity of bovine meat (6.8 million tonnes). The EU produced much smaller quantities of sheep meat and goat meat.

In 2021, slightly more than one-fifth (22.1%, or 5.2 million tonnes) of the EU's pigmeat production came from Spain, with a similar contribution made by Germany (21.2%); each of the remaining EU Member States had single-digit shares of the EU total.

The highest level of poultry meat production was in Poland (19.2 % of the EU total, or 2.5 million tonnes), while France (12.5%), Spain (12.3%), Germany (12.0%) and Italy (10.4%) each recorded double-digit shares of EU production.

Slightly more than one-fifth of all the EU's bovine meat production was from France (20.9%, or 1.4 million tonnes), with relatively large shares for Germany (15.8%), Italy (11.0%), Spain (10.6%) and Ireland (8.7%).

Spain had the highest share of the EU's sheep meat production (28.0%, or 120 thousand tonnes), while most of the remaining production in the EU came from France (19.0%), Ireland (14.8%) and Greece (12.0%).

Market projections

According to OECD-FAO[2] projections, world meat production is expected to increase by 41 Mt cwe to an estimated 382 Mt cwe by 2032, with most of the growth occurring in Asia, led by a 20 Mt increase in poultry production. In China, the rise in pigmeat production will offset the projected decline in European output, impacted by factors such as ASF outbreaks, stricter environmental laws, and animal welfare regulations in some EU countries. The ASF outbreak continues to impact Asia, mainly in the Philippines and Thailand and will continue to do so in the early years of the outlook period (2023-2032).

In recent years, high feed and labour costs have been significant challenges for meat producers worldwide. Feed costs are a significant share of the total cost of meat production, particularly for monogastric animals such as poultry and pigs[3]. This means that fluctuations in feed prices can have a marked impact on meat producers' profit margins. Similarly, rising labour costs[4] make it more

2. OECD-FAO Agricultural Outlook 2023-2032 (https://www.oecd.org/publications/oecd-fao-agricultural-outlook-19991142.htm).

3. The proportion of feed costs in the cost of producing meat can vary depending on the type of meat and the specific production system. In major meat producing countries with intensive farming systems chicken feed costs can account for 60-70% of the total cost of production, while in pig production, it can account for 50-70% of the total cost. In ruminant animals such as cattle and sheep, feed costs are generally a lower proportion as these animals can graze on pasture and consume a wider range of feed sources. In the case of feedlot operations, it can represent around 25% of the total cost. However, the total cost of cattle production is much higher, as is total feed use per kg of meat produced.

4. For example, in broiler chicken production, labor costs can account for around 5-10% of the total cost of production, while in pig production, it can be around 10-20%. In the case of ruminant animals, labor costs are generally lower as they require less intensive management.

difficult for meat producers to expand their operations increasing their financial risk, especially at the beginning of the outlook period, when inflation and interest rates are assumed to remain high.

Poultry will increase its dominance within the meat complex, accounting for half of all additional meats produced in the next decade. Poultry production will expand rapidly in countries with a surplus of feed grains, such as Brazil and the United States. Expansion is also foreseen in Asia as the shift away from pigmeat triggered by ASF outbreaks has benefitted poultry, particularly in China in recent years. In India, Türkiye and Indonesia, the poultry industry remains one of the fastest-growing segments of the agricultural sector, primarily driven by the expanding demand for animal protein and the rising utilisation of eggs for the bakery and confectionery sectors. Poultry has advantages over other meats in terms of production length, costs, feed conversion ratio, and proximity to growing urban markets.

While a range of factors has driven the shift towards poultry, its production also faces environmental and health challenges, particularly regarding antibiotic use and animal welfare. Therefore, promoting sustainable and responsible poultry production practices will be critical to the long-term growth of the sector.

In several European countries, pigmeat output will decline throughout the outlook period. This is because ongoing cost pressures in feed, energy, disease outbreaks and current and future environmental regulations and welfare standards are part of the European Commission's Farm to Fork Strategy (such as the "End the Cage Age").

China's pigmeat production is assumed to recover, and its share of world production will return to the level of the last decade (45%) after reaching the pre-ASF level in 2023. Viet Nam, which has suffered from ASF-reduced output since 2019, recovered faster as production was not as much affected, and it resumed its pre-ASF trajectory by 2022. As most ASF recovery in Asian countries affected by the disease is assumed to occur in the first half of the Outlook projection, **global production is projected to increase by 0.6% p.a. during the next decade.** Most of the increase in pigmeat production will occur in the Asian ASF-affected regions where conversion from largely small-scale backyard holdings to large-scale commercial enterprises with higher biosecurity standards is taking place.

Beef production will reach 78 Mt cwe by the end of the outlook period. The main contributors to this expansion are China's growth following technological improvements, better cattle management, and genetics, and increasing milk production in Pakistan, where animals are used for milk and draft purposes. Türkiye will also be one of the main contributors to the production expansion as is expected from government intervention in the form of imports of livestock genetics, higher producer support, and interventions to offset high feed prices. In Australia, increasing slaughter capacity and profitability will trigger higher beef production over the outlook period.

Beef production will increase with higher carcass weights as feed costs decline and animal genetics are improved. Increased livestock slaughter numbers also contribute after multiple years of higher herd numbers in several African producing regions (particularly in Sub-Saharan) and Asia.

Sheep meat production is anticipated to reach 19 Mt cwe by 2032. Chinese production is projected to increase in response to high prices and contribute 17% of additional production. Increased availability in the global sheep meat market will be due to flock rebuilding and increased lambing rates in Asia and Sub-Saharan Africa. Production in the European Union is projected to increase slightly from the current level due to production-coupled income support and favourable producer prices in the main sheep-producing Member States. The share of Africa in global sheep meat production will slowly increase despite limitations linked to urbanisation, desertification, and feed availability in some countries. New Zealand's pledge to reduce GHG emissions is expected to constrain flock size as productive sheep land is converted into plantations for carbon credits.

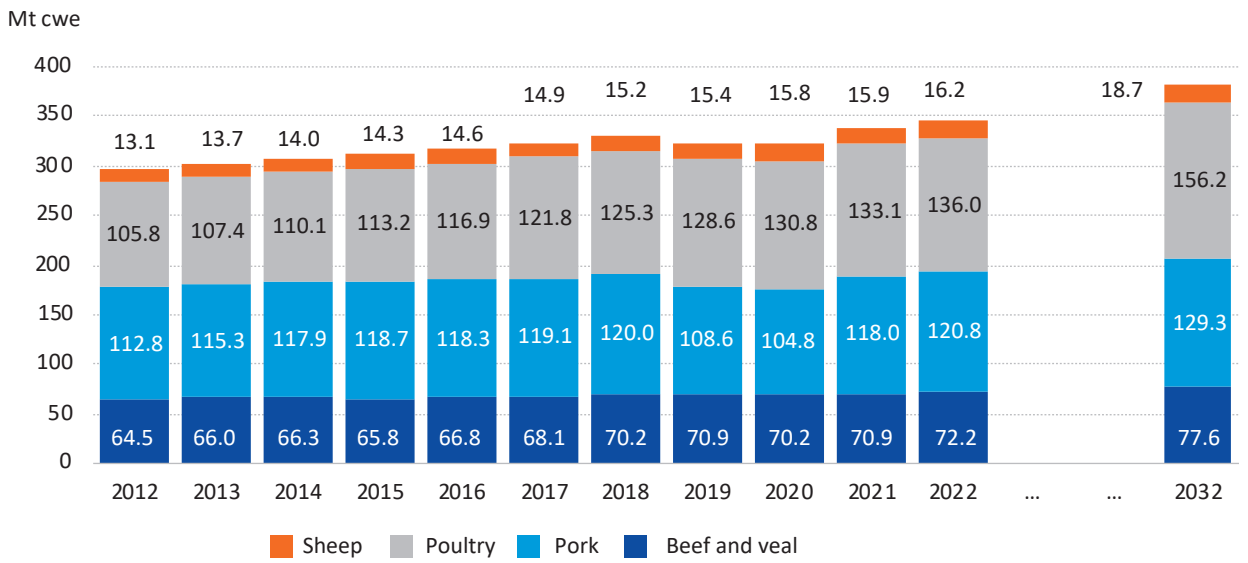
1.1.2 Consumption. Trends. Leading Countries.

Poultry and sheep meat consumption has seen significant growth on a global scale over the last decade. Poultry meat consumption increased by 28%, while sheep meat consumption rose by 24% (from a relatively lower consumption base compared to other meat categories).

The increase in poultry consumption can be attributed to factors such as its affordability, versatility, and relatively lean and healthy image compared to some other meats. Sheep meat, on the other hand, may have seen growth due to changing consumer preferences, increased awareness of its qualities, and the development of new culinary trends.

Beef and veal meat consumption experienced a moderate increase of 12% over the last decade. Pork meat consumption had the lowest increase, with a rise of around 7% over the same period. Pork consumption patterns can vary widely across regions and cultures, and the relatively lower increase in consumption may be due to factors like dietary preferences and cultural considerations.

Figure 3. Global meat consumption by meat type, 2012-2022 & projections for 2032



Source: OECD/FAO

The European Union (EU) maintains a well-balanced meat consumption profile, being a significant consumer of various meat categories. The EU's consumption patterns reflect a diverse and balanced diet, with the EU consistently ranking among the top four consumers in every major meat category, including poultry, pork, beef, veal, and sheep meat. This balanced approach to meat consumption is indicative of the region's diverse culinary traditions, dietary preferences, and the availability of various types of meat.

Figure 4. TOP 10 global meat consumers by meat type, 2022 (Mt cwe)

Rank	Beef and veal		Pork		Poultry		Sheep	
1	US	12,649	CN	55,376	CN	22,578	CN	5,466
2	CN	9,972	EU	19,004	US	19,487	IN	837
3	BR	6,932	US	9,916	EU	12,275	PK	774
4	EU	6,581	RU	4,416	BR	10,789	EU	659
5	AR	2,401	VN	4,020	MX	4,804	NG	426
6	PK	2,371	BR	3,535	RU	4,525	IR	349
7	RU	1,883	JP	2,630	IN	4,298	UK	307
8	MX	1,678	MX	2,531	ID	4,088	ET	282
9	JP	1,311	KR	2,043	JP	2,541	AU	236
10	IN	1,185	PH	1,541	ZA	2,344	RU	215

Source: OECD/FAO & authors calculations

Market projections

Meat consumption patterns of consumers in most high-income countries (which represent 33% of total meat consumption for 16% of population in 2022) **have started to stagnate**, with changes mostly based on the type and quality of the meat consumed. However, due to their lower base intake and more rapid increases in population and incomes, **growth will be generated primarily from low- and middle-income countries.**

Worldwide, poultry, pigmeat, beef, and sheep meat consumption is projected to grow 15%, 11%, 10%, and 15% respectively by 2032. Poultry meat is expected to account for 41% of the protein consumed from all meat sources in 2032, followed by pig, bovine and ovine meat. The overall growth in the volume of meat consumption, aside from the United States, Brazil and China, is expected to be greater in low-income countries, especially India, Pakistan, the Philippines, Vietnam, and the Sub-Saharan region of Africa.

On a per capita basis, global meat consumption is set to rise by 2%. This increase of 0.7 kg/year/person on an edible retail weight equivalent basis (hereafter "rwe") by 2032 is similar to the previous decade and, again, is mainly due to the increase in the consumption of poultry meat. Globally, there is a growing trend among consumers to become increasingly sensitive to animal welfare, environmental and health concerns, and poultry has the least carbon footprint. In some instances, these shifts in preferences may lead to shrinking per capita meat consumption, as in the case of the European Union, for which the Outlook foresees an ongoing substitution of beef and pigmeat by poultry meat.

Global poultry consumption is projected to increase to 91 Mt rwe, accounting for nearly half of the additional meat consumed. The global increase in protein from poultry consumption as a share of total protein from meat has been the main feature in the growth in meat consumption for decades, this trend is expected to continue. This is due to several factors, particularly the lower price of poultry compared to other types of meat and that it contains a healthy combination of protein and low fat.

Environmental considerations also contributed to the shift towards poultry meat, as the production of red meat is often resource-intensive and can lead to high greenhouse gas emissions. On the other hand, poultry production is generally considered more efficient and less resource-intensive, making it a more sustainable choice for meat.

The increase in poultry consumption in the last decade was driven by rising consumption in Asia, particularly in China, India and Indonesia, Pakistan, and the Philippines. These trends will continue, but consumption is projected to grow rapidly in other regions, including Brazil, Sub-Saharan Africa, and the United States, reflecting poultry's significant and increasing role in diets worldwide.

Over the next decade, global pigmeat consumption is also projected to grow globally, apart from Europe, where consumption is already high, and health, environmental and societal concerns significantly impact consumer choice. **However, pigmeat will remain the most widely consumed meat in the European region.** Pigmeat will be the second largest contributor to the total growth in meat consumption and is projected to reach 93 Mt rwe by 2032. However, in per capita terms, this growth will be stagnant over the projection period. In Latin American countries per capita consumption is projected to increase, due to favourable relative pigmeat/beef prices. **Elsewhere, per capita demand is anticipated to be stagnant or decline.**

Global beef consumption is projected to reach 51 Mt rwe over the next decade. Global per capita consumption has fluctuated around 6 kg per capita rwe for the last decade and **is expected to remain stable over the outlook period.** Most regions are projected to reduce their beef intake apart from the Asia-Pacific region, where per capita beef consumption is projected to increase by 0.4 kg/year rwe.

There are growing concerns about the environmental impact of beef production, which is perceived as a significant contributor to greenhouse gas emissions. In addition, deforestation caused by land-use changes for grazing and feed production is also concerning. As a result, many consumers have chosen to reduce their beef consumption in favour of poultry meat which has a smaller environmental footprint. North America and Oceania, which historically have strongly preferred beef, are expected to see the most significant decrease in per capita consumption. In contrast, China, the world's second-largest beef consumer although relatively low in per capita terms, is projected to see a further 0.8 kg/year rwe increase in its per capita consumption by 2032. This is partly due to a growing middle class in China, which has increased demand for meat, including beef.

While **sheep meat consumption** is a relatively small part of the global meat market, it **remains an essential source of protein for many consumers, particularly in the Middle East and North Africa.** While some change is occurring in global dietary patterns, the contribution of sheep meat to total protein from meat is projected to remain stable. It is mainly a traditional (cultural) food choice, although competition from beef and poultry ensures the latter are often more widely available and cheaper than sheep meat.

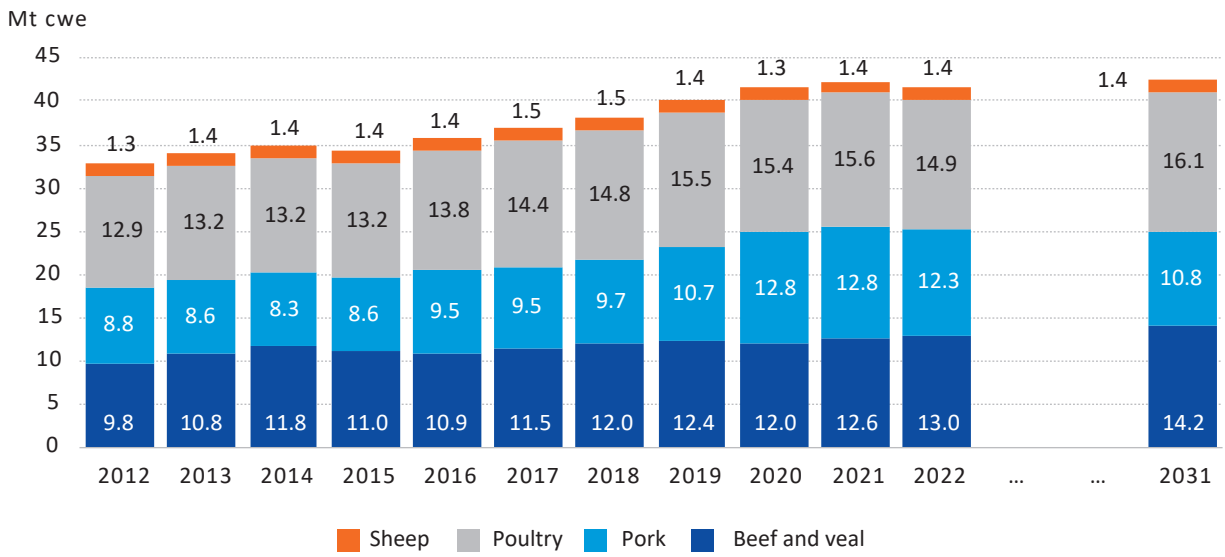
1.1.3 Trade. Trends. Leading Countries.

In 2022, global total meat exports amounted to 41.5 million tonnes, which represented a decrease of 1.9 percent from the previous year, 2021. Notably, both poultry and pork meat exports experienced a 4% decrease in 2022.

Over the past decade, pork and beef and veal meat experienced the most significant increases in exports.

Pork meat exports grew by 39%, while beef and veal meat exports increased by 33%. These substantial increases indicate that there has been a growing international demand for both pork and beef and veal meat products.

Figure 5. Global meat exports by meat type, 2012-2022 & projections for 2031



Source: OECD/FAO

The European Union (EU) indeed maintains a prominent and leading position in the global meat export market. In 2022, the EU was the largest exporter of pork meat, with a substantial export volume of 5,042 metric tons (cwe). This underscores the EU's strong presence in the international pork meat trade and its ability to meet global demand for this meat category.

Figure 6. TOP 10 global meat exporters by meat type, 2022 (Mt cwe)

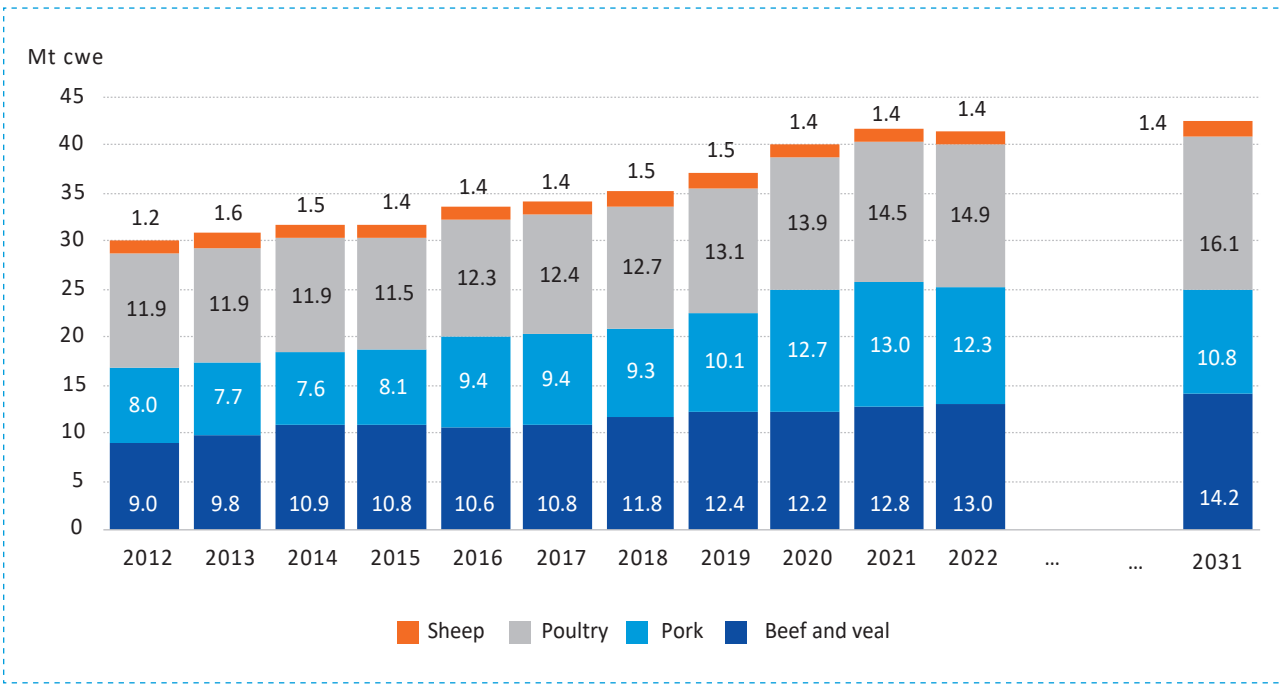
Rank	Beef and veal		Pork		Poultry		Sheep	
1	BR	2,236	EU	5,042	BR	4,029	AU	500
2	US	1,535	US	3,011	US	3,361	NZ	442
3	IN	1,417	CA	1,667	EU	2,143	EU	115
4	AU	1,298	BR	918	TH	1,298	UK	83
5	EU	856	MX	317	TR	575	IR	20
6	CA	802	CL	277	CN	537	IN	19
7	AR	797	UK	265	UA	464	US	8
8	NZ	663	TH	261	UK	364	ET	8
9	MX	533	CN	126	RU	340	CL	6
10	PY	482	RU	56	MY	234	PK	5

Source: OECD/FAO & authors calculations

Additionally, the EU ranked as the third-largest exporter of poultry and sheep meat, further showcasing its significant role in these categories. It was also the fifth-largest exporter of beef and veal meat. The EU's high standards in food safety, quality, and production contribute to its success as a major exporter in multiple meat categories. These export rankings highlight the EU's continued importance in the global meat trade across various categories.

In 2022, poultry meat accounted for approximately 36% of the world's total meat imports, indicating its significant role in global meat trade. Both beef and veal meat and pork meat had a similar share of about 30% each in total meat imports. These figures highlight the substantial global demand for poultry, beef, and pork meat products.

Figure 7. Global meat imports by meat type, 2012-2022 & projections for 2031



Source: OECD/FAO

China's prominence as a meat importer is driven by several factors, including its large population, rising consumer affluence, shifting dietary preferences, and the need to meet the demands of its domestic market. As a result, China serves as a major destination for meat exporters worldwide, making it the world's largest meat importer across multiple categories.

The European Union (EU) primarily imports poultry, beef and veal, and sheep meat, which presents potential opportunities for countries like Moldova to explore the EU market for their meat production.

Moldova's meat producers may find export potential in these categories to the EU, as there is demand for these types of meat products within the region. Entering the EU market can be a strategic move for Moldova to expand its meat exports and reach a broader consumer base.

To capitalize on these opportunities, it's essential for Moldova to meet the EU's stringent food safety and quality standards and adhere to trade regulations and requirements. Developing strong trade relationships and distribution networks within the EU can also be pivotal in establishing a successful presence in this market.

Figure 8. TOP 10 global meat importers by meat type, 2022 (Mt cwe)

Rank	Beef and veal		Pork		Poultry		Sheep	
1	CN	3,067	CN	3,501	CN	1,344	CN	383
2	US	2,016	JP	1,336	MX	1,103	SA	189
3	JP	845	MX	1,158	JP	907	US	142
4	KR	585	US	773	EU	743	EU	136
5	ID	449	UK	742	SA	677	UK	90
6	CL	395	KR	677	UK	666	MY	34
7	EG	371	PH	441	PH	481	JP	23
8	UK	355	AU	383	ZA	436	CA	23
9	EU	342	CA	278	UA	356	KR	19
10	RU	342	VN	238	RU	277	CH	7

Source: FAO & authors calculations

Market projections

Global meat exports are projected to rise 3% by 2032 from the base period, reaching 42 Mt cwe with almost 11% of meat output traded. Still, the growth in the meat trade is projected to decelerate compared to the past decade. Developed countries are still expected to account for more than half (55%) of global meat exports by 2032, a share which is 3% point lower than in the base period. However, the share of Brazil and the United States, each representing 20%, will remain stable over the projection period.

Australia and Türkiye are expected to record the most significant increase in world meat exports globally, benefiting from a favourable exchange rate and ample feed grain availability. Other traditional exporting countries, such as Argentina, Paraguay, and Thailand, are also expected to contribute to the increase in the global meat trade. On the other hand, **the European Union export share will decline from 18% in the base year to 15% in 2032.**

The most significant growth in import demand originates from Africa, which will account for the 78% of additional imports of all meat types. Asia, excluding China, is another fast-growing meat importing region. While Chinese meat imports remain high in the early part of the projection period, a gradual decline is projected as pigmeat production recovers from the ASF outbreak. In terms of composition, **poultry will account for two third of the additional meat imports, bringing its share of total meat imports to 40% by 2032.**

Australia and New Zealand will continue to lead global sheep meat markets. Australia is expected to increase lamb exports (of higher value) to high end restaurants at the expense of mutton, while in New Zealand, exports will slowly decline as land use shifts from sheep farming. The source of higher import demand is the rising middle-class consumer in the Middle East.

1.1.4 Prices.

Market projections

The Outlook projects that **although meat prices are currently high, they are expected to decrease in both nominal and real terms** at the start of the outlook period under weaker demand and higher supplies as the impact of disease outbreaks wanes, particularly in China. **The evolution of the situation in China impacts the world reference price of pigmeat and, to a lesser extent, that of other meats.** In fact, at the start of the outlook period, the faster China recovers from ASF and lowers its meat imports, the lower prices will be in subsequent years.

As markets recover from these disruptions and consumer spending on meat in middle-income countries resumes, particularly for poultry and pigmeat, prices are expected to return to their long-term trend decline in real terms. As a result, **by 2032, meat prices in real terms are projected to be 10% to 15% lower than their 2020-2022 averages. Moreover, red meat prices will be increasingly higher than pigmeat and poultry due to more limited productivity gains.**

1.2 Dairy products

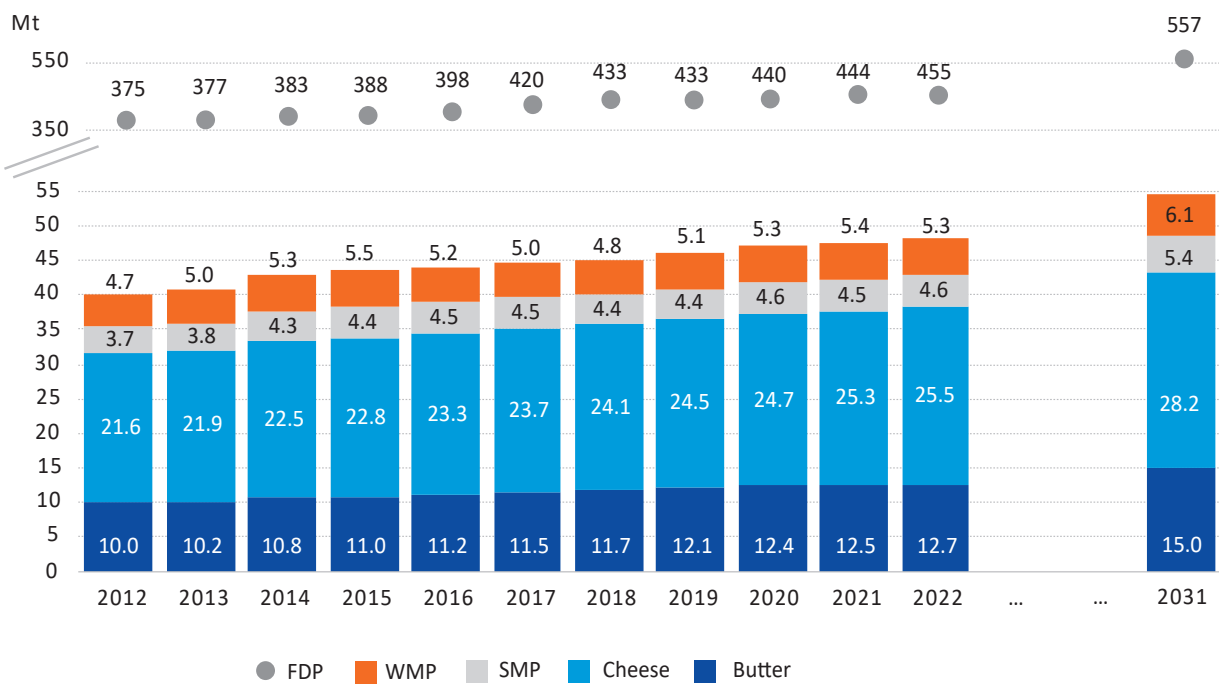
This chapter describes market developments and medium-term projections for world dairy markets for the period 2023-2031/2032. Market developments and medium-term projections cover consumption, production, trade and prices for milk, fresh dairy products, butter, cheese, skim milk powder and whole milk powder.

1.2.1 Production. Trends. Leading Countries.

The dairy industry has experienced substantial growth over the past decade, with both fresh dairy products (FDP) and processed dairy products, such as butter, cheese, skim milk powder (SMP), and whole milk powder (WMP), seeing an increase in production of approximately 20%. These developments underscore the evolving preferences of consumers and the expanding demand for dairy products.

The rise in fresh dairy product production suggests continued demand for items like milk, yogurt, and other unprocessed dairy goods. Simultaneously, the increased production of processed dairy products reflects a growing demand for value-added and preserved dairy products.

Figure 9. Global production of dairy products, 2012-2022 & projections for 2032



Source: OECD/FAO

The European Union (EU) maintains a robust position in each category of dairy products, demonstrating its substantial production potential in the dairy industry.

This reflects the EU's capacity to produce a wide range of dairy products and highlights its leading role in the global dairy market. The EU's ability to maintain competitiveness and meet international demand in various dairy categories underscores its significant role as a dairy producer and exporter.

India and Pakistan are prominent leaders in fresh dairy product (FDP) production, with a substantial portion of their dairy production consumed in the form of fresh dairy products. These countries have a large and growing population with considerable demand for fresh dairy products, making it a central part of their daily diet. As a result, India and Pakistan have become significant producers of FDPs to meet domestic consumption needs.

Figure 10. TOP 10 global dairy products producers, 2022 (Mt)

Rank	FDP		WMP		SMP		Cheese		Butter	
1	IN	135.08	NZ	1.62	EU	1.44	EU	10.91	IN	5.16
2	PK	47.93	CN	1.15	US	1.29	US	6.24	EU	2.35
3	EU	37.61	EU	0.66	NZ	0.38	BR	0.82	PK	1.15
4	CN	28.51	BR	0.65	IN	0.32	EG	0.61	US	0.95
5	US	22.13	MX	0.23	BR	0.17	RU	0.59	NZ	0.44
6	TR	18.02	AR	0.19	AU	0.14	CA	0.50	RU	0.31
7	BR	17.08	CL	0.10	JP	0.12	UK	0.50	TR	0.29
8	RU	16.85	ID	0.09	CA	0.10	AR	0.46	MX	0.21
9	UK	7.36	US	0.06	RU	0.09	AU	0.40	IR	0.20
10	UA	6.27	RU	0.06	UK	0.08	NZ	0.40	UK	0.15

Source: OECD/FAO & authors calculations

Share of EU dairy products (%, 2021)

Some of the principal dairy products that are produced in the EU include drinking milk, whey (a by-product in the manufacture of cheese), butter and cheese. Germany had the highest level of production for all four of these dairy products in 2021: 16.5 million tonnes of whey, 4.4 million tonnes of drinking milk, 2.4 million tonnes of cheese and 391 thousand tonnes of butter.

The other main cheese producing Member States were France (1.9 million tonnes, or about 18 % of the EU total), Italy (1.4 million tonnes; 13 %) and the Netherlands (954 thousand tonnes; 9 %). The Netherlands also had the second highest level of production for whey (8.7 million tonnes), while 276 thousand tonnes of butter were produced in Ireland (the third highest value among EU Member States).

Market projections

Globally, around 30% of milk will be further processed into products such as butter, cheese, SMP, WMP, or whey powder in the coming decade. However, there is notable regional dispersion. **In high-income countries, most of the milk production is transformed into dairy products.** Given the considerable direct food demand for **butter** and cheese, these **presently account for a large share of consumption of milk solids in Europe and North America. SMP and WMP are largely produced for trade,** for use in the food processing sector, notably in confectionery, infant formulae, and bakery products. **In low- and lower middle-income countries most of the milk production goes into fresh dairy products.**

World milk production is projected to grow at 1.5% p.a. (to 1,039 Mt by 2032) over the next decade, faster than most other main agricultural commodities. Growth in the number of milk-producing animals is expected to be strong (1.3% p.a.), especially in Sub-Saharan Africa and in major milk-producing countries such as India and Pakistan – where yields are low. Yields across the world are expected to grow steadily over the next decade.

India is the largest producer of milk and is expected to experience a continued strong production growth. The growth is expected to come from more milking cows and buffaloes as well as from yield increases.

Production in the European Union is projected to decline with fewer dairy herds and slower yield growth. A growing share of milk is expected to be organic or from other non-conventional production systems. At present, more than 10% of dairy cows are within, but not limited to, organic systems located in Austria, Denmark, Greece, Latvia, and Sweden. Germany and France have also seen an increase in organic dairy production. However, as organic yields are about a quarter lower than in conventional production systems, and higher production costs, they need to command a substantial price premium.

North America has some of the highest average yields per cow, as the share of grass-based production is low, and

feeding is focused on high yields from specialised dairy herds. **Dairy herds in the United States and Canada are expected to remain largely unchanged and production growth to originate from further yield increases.** As domestic demand is projected to remain stronger for milk fats, the United States will continue to expand SMP exports.

Although the share of New Zealand in world milk production is only 2.5%, it is the most export-orientated country. After expanding milk production strongly over the last twenty years, **milk output growth has stalled in recent years, and is projected to grow at 0.4% p.a. over the next decade.** Milk production is mainly grass-based, and yields are considerably lower than in North America and Europe. The cost efficiency of grass management, however, allows New Zealand to be competitive.

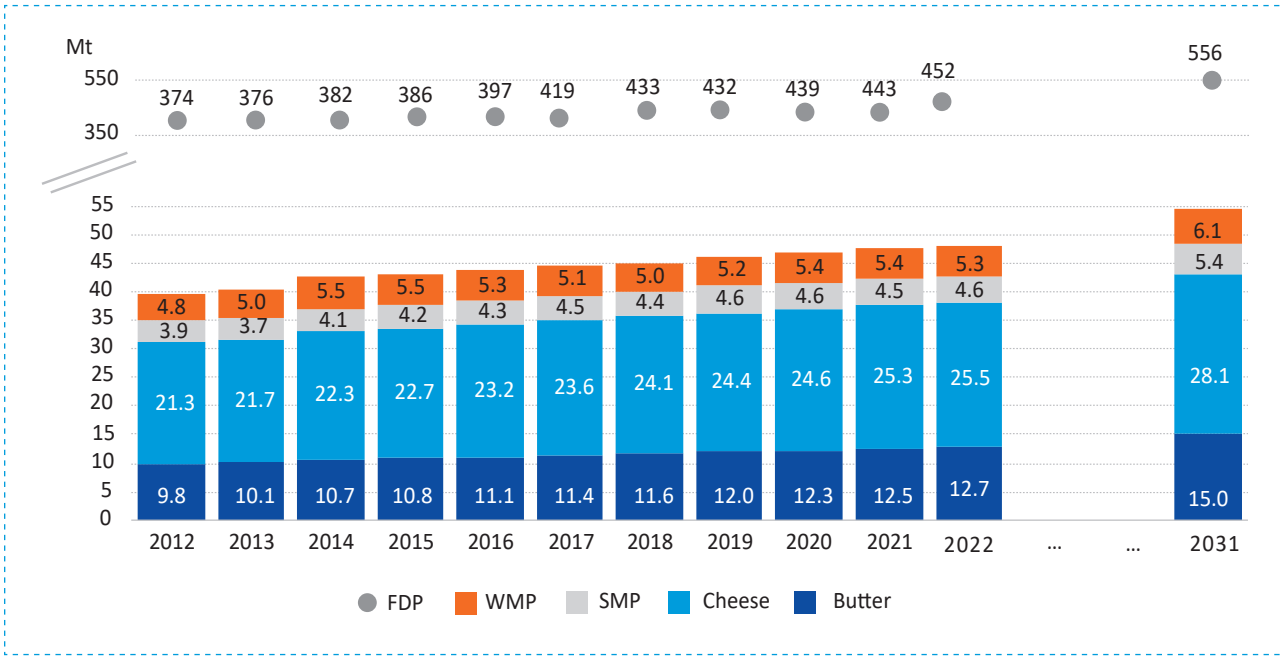
Strong production growth is expected in Africa, mostly due to larger herds. These will usually have low yields, and a considerable share of milk production will come from goats and sheep. Over the projection period, about a third of the worldwide herd population is projected to be in Africa and to account for around 6% of world milk production.

1.2.2 Consumption. Trends. Leading Countries.

The dominant processed dairy product in global consumption is cheese, accounting for a significant share of 53% in 2022. Following cheese, butter is the second most consumed processed dairy product, representing 26% of the market.

Skim milk powder (SMP) and whole milk powder (WMP) each hold a share of approximately 10-11% in terms of world consumption, playing a notable role in various processed food products and applications.

Figure 11. Global consumption of dairy products, 2012-2022 & projections for 2032



Source: OECD/FAO

The European Union (EU) stands out as the largest global consumer of cheese and skim milk powder (SMP). It is also the second-largest consumer of butter. This reflects the EU's position as a major player in the dairy sector and highlights the importance of dairy products in European diets and food culture.

Figure 12. TOP 10 global dairy products consumers, 2022 (Mt)

Rank	FDP		WMP		SMP		Cheese		Butter	
1	IN	135.1	CN	1.87	EU	0.66	EU	9.64	IN	5.14
2	PK	47.9	BR	0.69	CN	0.44	US	5.98	EU	2.13
3	EU	36.2	EU	0.39	US	0.38	RU	0.88	PK	1.15
4	CN	29.5	MX	0.25	MX	0.38	BR	0.84	US	0.97
5	US	22.0	ID	0.16	IN	0.29	UK	0.83	RU	0.43
6	TR	18.0	SA	0.12	ID	0.20	EG	0.59	TR	0.28
7	BR	17.2	CL	0.10	BR	0.19	CA	0.54	CN	0.23
8	RU	17.1	RU	0.07	PH	0.17	JP	0.46	MX	0.23
9	UK	7.5	NG	0.07	JP	0.16	MX	0.46	IR	0.21
10	UA	6.3	AR	0.07	RU	0.15	AR	0.40	UK	0.20

Source: OECD/FAO & authors calculations

Market projections

Although milk is a highly perishable product which must be processed shortly after collection, most milk is consumed in the form of fresh dairy products[5], including those fermented and pasteurised. The share of fresh dairy products in global consumption is expected to increase over the coming decade due to stronger demand growth in India and Pakistan, which in turn is driven by income and population growth. **World per capita consumption of fresh dairy products is projected to increase by 1.0% p.a. over the coming decade,** slightly faster than over the past ten years, primarily driven by higher per-capita income growth.

Milk consumption per capita (in terms of milk solids) will vary largely worldwide, driven by varying growth in incomes and regional preferences. **In low- and lower middle-income countries most of the production is consumed in the form of fresh dairy products.** The consumption of fresh dairy products per capita is expected to be high in India and Pakistan, but low in China.

In Europe and North America, overall per capita demand for fresh dairy products is stable to declining but the composition of demand has been shifting over recent years towards dairy fat such as full-fat drinking milk and cream. Plant-based dairy replacements are increasingly established and competing more with fresh dairy products than with processed dairy products.

The share of processed dairy products, especially cheese, in overall consumption of milk solids is expected to be closely related to incomes, with variations due to local preferences, dietary constraints, and urbanisation. **The largest share of total cheese consumption, the second most consumed dairy product, occurs in Europe and North America, where per capita consumption is expected to continue to increase over the projection period.** Consumption of cheese will also increase in regions where it has not been traditionally part of the national diet. In Southeast Asian countries, urbanisation and income increases have resulted in more away-from-home eating, including fast food such as burgers and pizzas.

Butter consumption has seen a recovery in Europe and North America due to shifting preferences. Consumers may be influenced by recent studies that have shed a more positive light on the health impact from butter consumption, contrary to earlier messaging.

The dominant use of SMP and WMP will continue to be in the manufacturing sector, notably in confectionery, infant formula, and bakery products. A small share of dairy products, especially SMP and whey powder, are used in animal feed. **Whey powders are gaining prominence globally because of their use in the processing of nutritional products, especially of clinical, infant, and elderly preparations.**

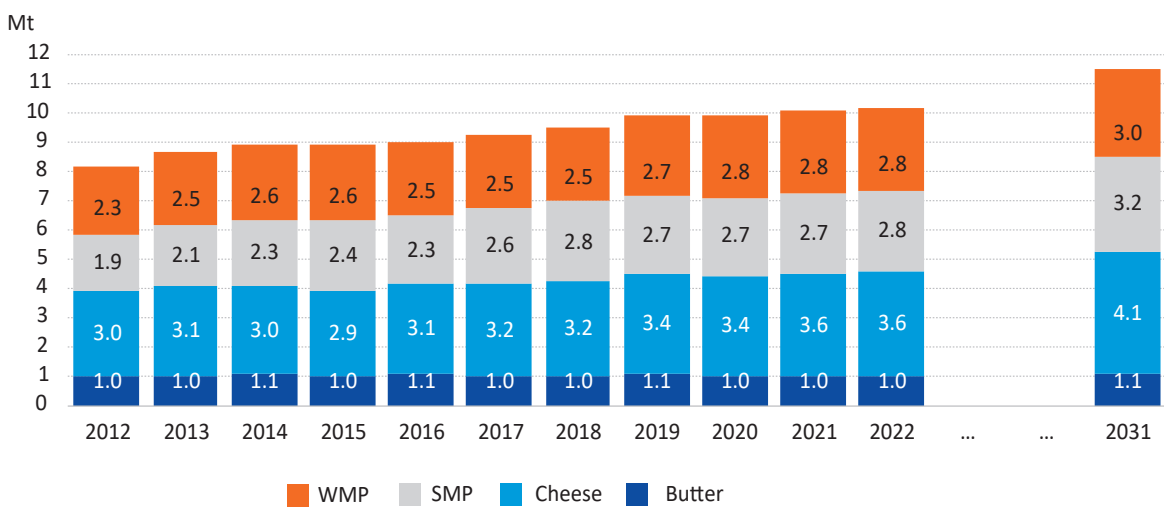
5. Fresh dairy products contain all dairy products and milk which are not included in processed products (butter, cheese, skim milk powder, whole milk powder, whey powder and, for few cases casein). The quantities are in cow milk equivalent.

1.2.3 Trade. Trends. Leading Countries.

In 2022, approximately 10.1 million metric tons of processed dairy products were exported, which is consistent with the export volume of the previous year, 2021. Among these exports, cheese was the predominant processed dairy product, with 3.6 million metric tons (Mt).

Over 50% of world production of WMP and SMP is traded since these products are often produced only to store and trade milk over a longer time period or distance. Fresh dairy products are very lightly traded as small amounts of fermented milk products between neighbouring countries.

Figure 13. Global dairy products exports (imports), 2012-2022 & projections for 2031



Source: OECD/FAO

The European Union (EU) maintains its position as the world's leading cheese exporter, with an impressive volume of 1.46 million metric tons (Mt) in 2022. Additionally, the EU holds the second-largest exporter status for other dairy processed products. The EU's well-established dairy industry and diverse dairy product offerings contribute to its leadership in international trade.

Figure 14. TOP 10 global dairy products exporters, 2022 (Mt)

Rank	WMP		SMP		Cheese		Butter	
1	NZ	0.61	US	0.92	EU	1.46	NZ	0.41
2	EU	0.29	EU	0.81	US	0.40	EU	0.26
3	AR	0.12	NZ	0.38	NZ	0.36	UK	0.04
4	UK	0.05	AU	0.11	UK	0.18	US	0.04
5	US	0.05	UK	0.10	AU	0.16	IN	0.02
6	AU	0.03	TR	0.06	IR	0.09	AU	0.02
7	MY	0.03	IR	0.05	SA	0.08	UA	0.01
8	RU	0.02	IN	0.03	CH	0.07	SA	0.01
9	VN	0.01	AR	0.02	AR	0.07	TR	0.01
10	SA	0.01	CA	0.02	TR	0.06	MX	0.01

Source: OECD/FAO & authors calculations

Imports are spread more widely across countries, with the dominant destinations for all dairy products being the NENA (countries in the Near East and North Africa), high-income countries, Southeast Asia, and China.

The European Union (EU) also engages in cheese imports, with a volume of 188,000 tonnes in 2022. This import activity indicates that Moldova's cheese producers may potentially discover export opportunities to the EU in the near future.

Moldovan cheese producers could tap into this market by aligning their products with the preferences and regulations of the EU. Ensuring high-quality standards and compliance with EU food safety and quality regulations will be vital for Moldova's cheese producers seeking to export to the EU.

Figure 15. TOP 10 global dairy products importers, 2022 (Mt)

Rank	WMP		SMP		Cheese		Butter	
1	CN	0.72	CN	0.42	UK	0.51	CN	0.14
2	SA	0.13	MX	0.34	RU	0.32	RU	0.12
3	NG	0.07	ID	0.20	JP	0.30	UK	0.09
4	ID	0.07	PH	0.17	SA	0.20	SA	0.05
5	TH	0.06	NG	0.12	EU	0.19	US	0.04
6	BR	0.05	VN	0.12	CN	0.16	AU	0.04
7	MY	0.04	MY	0.12	KR	0.16	EU	0.03
8	VN	0.04	EG	0.07	US	0.15	PH	0.03
9	PE	0.03	TH	0.06	MX	0.12	EG	0.03
10	RU	0.03	RU	0.06	AU	0.10	MX	0.03

Source: OECD/FAO & authors calculations

Market projections

Only around 7% of world milk production is traded internationally, primarily due to its perishability and highwater content (more than 85%). **Over 50% of world production of WMP and SMP is traded** since these products are often produced only to store and trade milk over a longer time period or distance. **Fresh dairy products are very lightly traded as small amounts of fermented milk products between neighbouring countries** (Canada and the United States, the European Union and Switzerland). An exception is imports of liquid milk by China from the European Union and New Zealand, due to Ultra-High Temperature milk and cream products able to be shipped long distances, but also favourable Chinese freight rates in some cases. China's net imports of fresh dairy products over the base period reached 1.2 Mt, and this is not projected to increase much over the next decade.

World dairy trade is projected to expand over the next decade to reach 14.2 Mt in 2032, 11% higher than during the base period. Most of this growth will be met by increased exports from the United States, the European Union and New Zealand. These three countries are projected to jointly account for around 65% of cheese, 70% of WMP, 70% of butter, and 80% of SMP exports in 2032. Australia, another exporter, has lost market shares although it remains a notable exporter of cheese and SMP. In the case of WMP, Argentina is also an important exporter and is projected to account for 5% of world exports by 2032. In recent years, Belarus has become an important exporter, orienting its exports primarily to the Russian market due to the Russian embargo as of 2015 on several major dairy exporting countries.

The European Union will continue to be the main world cheese exporter, followed by the United States and

New Zealand. The United Kingdom, Japan, Russia, the European Union, and Saudi Arabia are projected to be the top five cheese importers in 2032. These countries are often also exporters of cheese and international trade is expected to increase the choice of cheeses for consumers.

New Zealand remains the primary source for butter and WMP on the international market, and its market shares are projected to be around 40% and 60%, respectively, by 2032. China is the principal importer of WMP from New Zealand, but trade between the two countries is projected to be less dynamic over the projection period. The expected growth in domestic milk production in China will limit the growth in WMP imports. **It is expected that New Zealand will diversify and slightly increase its production of cheese over the outlook period.**

The United States is expected to be the most dynamic large exporter over the next decade and expand SMP exports especially. This would require growth in drying capacity which is beyond current investments. **SMP imports are disperse globally as it is often the easiest dairy product to trade for use in food processing.**

Imports are spread more widely across countries, with the dominant destinations for all dairy products being the NENA, high-income countries, Southeast Asia, and China. China is expected to continue to be the world's major dairy importer, especially for WMP with imports from China projected to represent 21% of global imports in 2032. Per capita consumption of dairy products in China is relatively low compared to traditional markets, but there have been significant increases in demand over the past decade, with growth projected to continue. Most of its dairy imports are sourced from Oceania, although in recent years the European Union has increased its exports of butter and SMP to China.

While some regions are self-sufficient, such as India and Pakistan, **total dairy consumption in Africa, Southeast Asian countries, and the NENA is expected to grow faster than production, leading to an increase in dairy imports.** As liquid milk is expensive to trade (high volume/value ratio), this additional demand growth is expected to be met with milk powders, where water is added for final consumption or further processing. **Imports by NENA are expected to originate primarily from the European Union, while the United States and Oceania are expected to be the main suppliers of powders to Southeast Asia.**

1.2.4 Prices.

Market projections

International dairy prices are of processed products of the main exporters in Oceania and Europe. The two main reference prices are butter and SMP, where butter is the reference for milk fat and SMP for other milk solids. Milk fat and other milk solids together account for about 13% of the overall weight of milk, the remainder being water.

Since 2015, the price of butter has increased considerably more than SMP. Increased demand for milk fat resulted in a price gap emerging between the two products and the price of butter will continue to be supported by stronger demand for milk fat compared to other milk solids on the international market. Therefore, the gap between the price of butter and SMP is assumed to remain a defining feature over the coming decade. Prices of butter and SMP are foreseen to slightly decline over the projection period as supplies respond to current price incentives. World prices for WMP and cheese are expected to be affected by butter and SMP price trends, in line with the respective content of fat and non-fat solids.

The strong volatility of international dairy prices stems from its small trade share, the dominance of a few exporters, and a widely restrictive trade policy environment. Most domestic markets are only loosely connected to those prices as fresh dairy products dominate consumption, and only a small share of milk is processed as compared to that which is fermented or pasteurized.

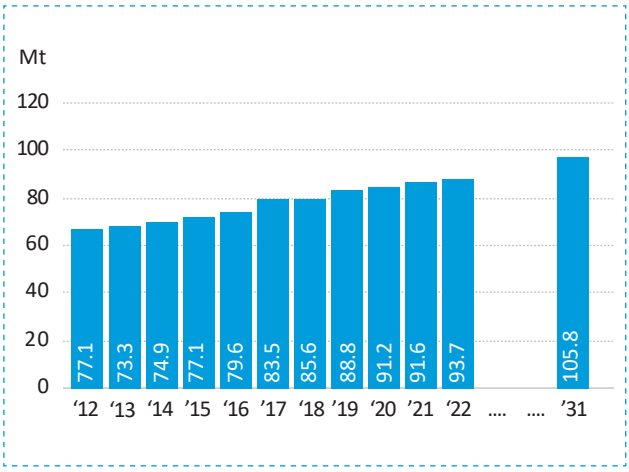
1.3 Eggs in shell, preserved or cooked

1.3.1 Production and consumption Trends. Leading Countries.

Egg production experienced a 2% increase in 2022, reaching a total of 93.7 million metric tons (Mt). Over the past decade, egg production has shown substantial growth, with a remarkable increase of 31%.

The primary egg producers and consumers globally include China, India, the European Union (EU), the United States, and Indonesia. It's worth noting that a significant portion of egg production is intended for self-consumption, with only a relatively small volume designated for export.

Figure 16. Global production and consumption of eggs in shell, preserved or cooked, 2012-2022 & projections for 2031



Source: OECD/FAO & authors calculations

Figure 17. TOP 10 global eggs in shell, preserved or cooked producers and consumers, 2022 (Mt)

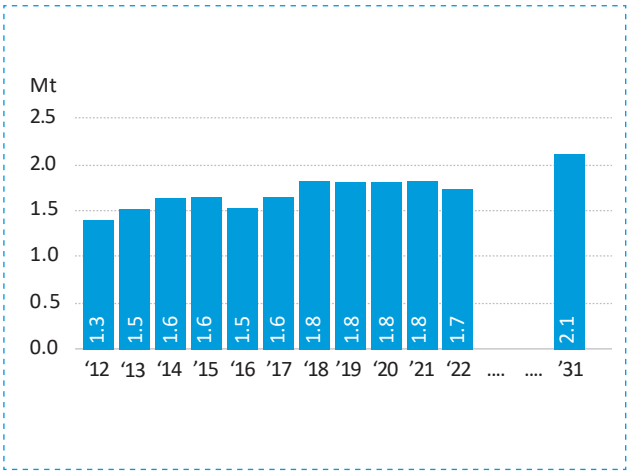
Rank	Production		Consumpton	
1	CN	34.3	CN	34.1
2	IN	6.9	IN	6.9
3	EU	6.6	EU	6.2
4	US	5.6	ID	5.6
5	ID	5.6	US	5.6
6	MX	3.1	MX	3.2
7	BR	3.0	BR	2.9
8	JP	2.7	JP	2.7
9	RU	2.7	RU	2.7
10	TR	1.3	UK	1.1

1.3.2 Trade. Trends. Leading Countries.

The European Union (EU) holds a prominent position in both the export and import of eggs in shell, whether preserved or cooked.

The EU's engagement in egg imports suggests that Moldova's egg producers may have the potential to explore export opportunities to the EU in the near future. To capitalize on this potential, Moldovan egg producers should focus on meeting EU quality and safety standards while aligning their products with the preferences and regulations of EU consumers. This presents a valuable avenue for Moldovan egg producers to enter the European market for eggs.

Figure 18. Global exports of eggs in shell, preserved or cooked, 2012-2022 & projections for 2031



Source: OECD/FAO & authors calculations

Figure 19. TOP 10 global eggs in shell, preserved or cooked exporters and importers, 2022 (Mt)

Rank	Exporters		Importers	
1	TR	0.39	UK	0.14
2	EU	0.39	JP	0.06
3	UA	0.15	EU	0.05
4	MY	0.12	RU	0.05
5	CN	0.11	CH	0.04
6	IN	0.07	CA	0.04
7	UK	0.05	SA	0.04
8	RU	0.03	MX	0.03
9	CA	0.03	IR	0.02
10	KZ	0.03	TH	0.01

1.4 EU positioning in world market in 2022

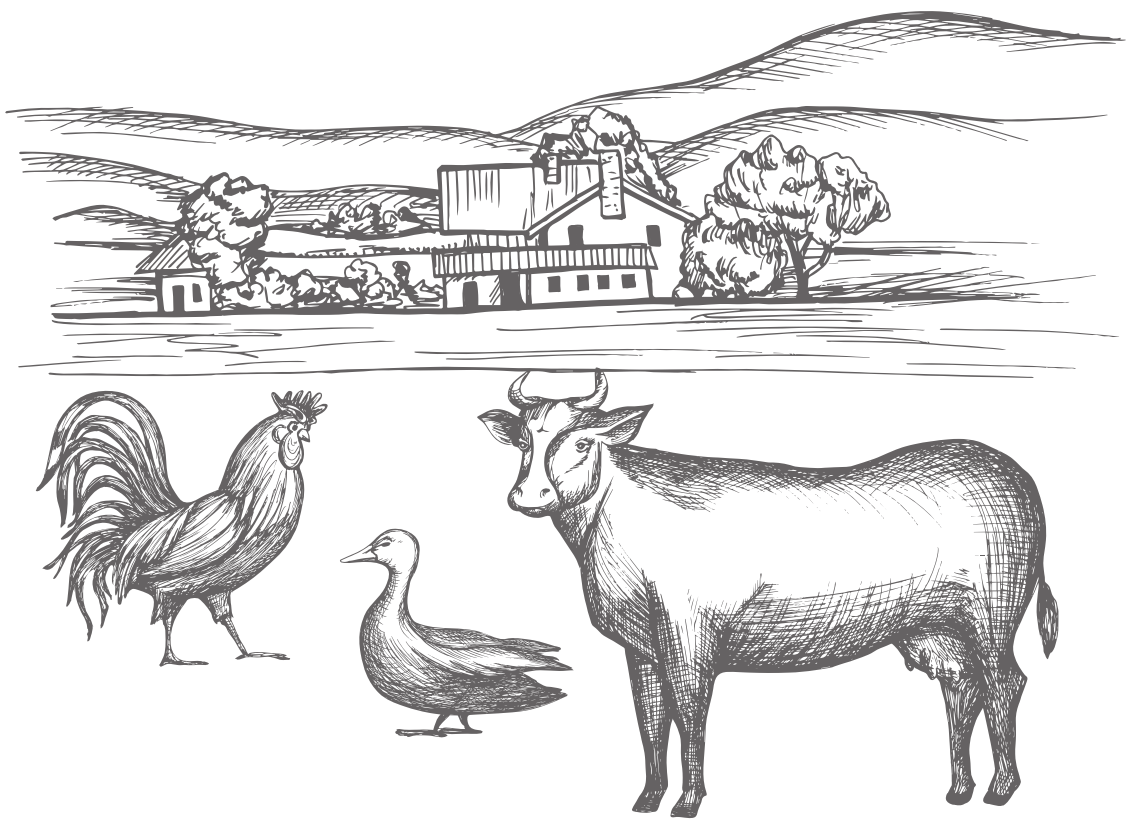
In summary, the EU stands as a global leader in the production, consumption, export, and import of meat and dairy products. Consequently, adherence to high-quality standards and compliance with EU food safety and quality regulations are imperative for Moldova's producers aspiring to export to the EU.

Table 2. EU position in the world rankings by production, consumption, export and import of meat and dairy products

Meat Market	Production	Consumption	Export	Import
Beef and veal	3	4	5	9
Pork	2	2	1	-
Poultry	4	3	3	4
Sheep	5	4	3	4

Dairy Market	Production	Consumption	Export	Import
FDP	3	3	-	-
WMP	3	3	2	-
SMP	1	1	2	-
Cheese	1	1	1	5
Butter	2	2	2	7

Source: OECD/FAO & authors calculations



2.

Standards and regulations in different markets with an emphasis on EU market requirements

European food safety policy aims are twofold: to protect human health and consumer interests and to foster the smooth operation of the European single market. The EU thus ensures that control standards are established and adhered to in the areas of feed and food-product hygiene, animal health, plant health and the prevention of food contamination from external substances.

In the wake of a series of human food and animal feed crises (e.g., the bovine spongiform encephalopathy (BSE) outbreak and the dioxin scare), EU food safety policy is focused on the development of **the 'Farm to Fork' approach,** which seeks to ensure a high level of safety at all stages of the production and distribution process for all food products marketed within the EU, whether produced within the EU or imported from third countries. There is a complex and integrated system of rules covering the entire food chain, from animal feed and health through plant protection and food production to processing, storage, transport, import and export and retail sales. These rules will be further described in the context of tasks of study analysis related to value chain meat, poultry meat (including eggs) and dairy product.

2.1 EU web services for import requirements for selected value chain products

Imported products of animal origin and live animals present a high level of risk as they can transmit serious human and animal diseases. Veterinary border controls ensure that consignments of live animals or products of animal origin can only enter the EU if they have satisfactorily undergone specific checks.

The EC provides all the necessary information that is essential for the country and products intended for import into the EU. The links below to the official EC internet accesses are related to value chain meat, poultry, and dairy products as follows:

- EU standards and regulations[6];
- EU import conditions of meat[7];
- EU import conditions of poultry[8];
- EU import of milk and milk products[9];
- EU import of composite products[10].

A detailed overview of the current situation of legal acts, new provisions on import or customs procedures, general and specific rules for animal origin products, including meat, poultry, and dairy products, is available on EC official internet webpages.

The main import procedures into the EU from third countries, according to value chain products, are described in sub-chapters 2.1.1-2.1.4.

2.1.1 EU import conditions for fresh meat and meat products.

The European Commission's Directorate General for Health and Food Safety establishes import rules for meat and meat products. By following these rules non-EU countries can guarantee that their exports of meat and meat products to the EU fulfil the same high standards as products from EU Member States - not only with respect to hygiene and all aspects of consumer safety but also regarding their animal health status.

General Rules for Meat and Meat Products

Imports of fresh meat and meat products into the EU are subject to veterinary certification - which is based on the recognition of the competent authority of the non-EU country by the Directorate-General for Health and Food Safety. This formal recognition of the reliability of the competent authority is a pre-requisite for the country to be eligible and authorised to export such products to the EU. Legally legitimate and adequately empowered authorities in the exporting country must ensure credible inspection and controls throughout the production chain, which cover all relevant aspects of hygiene, animal health and public health.

Specific Key Elements

For meat and meat products from all species, countries of origin must be on a positive list of eligible countries for the relevant product. The main criteria for the non-EU country to be listed and therefore eligible to export to the EU are:

- Exporting countries must have **a competent authority** which is responsible throughout the food chain. The authority must be empowered, structured and resourced to implement effective inspection and guarantee credible public health and animal health

6. www.eur-lex.europa.eu, https://trade.ec.europa.eu/access-to-markets/en/content/welcome-access2markets-trade-helpdesk-users
7. https://food.ec.europa.eu/system/files/2018-06/ia_trade_import-cond-meat_en.pdf
8. https://food.ec.europa.eu/system/files/2018-04/ia_trade_import-cond-poultry_en.pdf
9. https://eur-lex.europa.eu/EN/legal-content/summary/safe-imports-of-milk-and-dairy-products.html
10. https://food.ec.europa.eu/horizontal-topics/international-affairs/eu-entry-conditions/composite-products_en

attestations in the health certificate to accompany meat and meat products that are destined for the EU.

- The country or region of origin must fulfil the relevant **animal health standards.** This implies that the country should be a member of the World Organisation for Animal Health (OIE) and should meet that organisation's standards and reporting obligations. The competent authority (veterinary service) in the country must ensure effective enforcement of all necessary animal health controls.
- The competent authority must also guarantee that the relevant **hygiene and public health requirements** are met. The hygiene legislation contains specific requirements on the structure of establishments, equipment and operational processes for slaughter, cutting, storage and handling of meat. These provisions are aimed at ensuring that food is produced safely and that contamination of the product during processing is prevented.
- A residue **monitoring plan** for live animals and animal products which includes testing **for residues of veterinary drugs, pesticides, heavy metals, and contaminants, must be in place** to verify compliance with EU requirements. The plan (and results from the previous year's monitoring) must be submitted to the European Commission annually for approval. Countries with approved plans are listed. Countries with approved plans are listed.
- Imports are only authorised from **approved establishments** (e.g. slaughterhouses, cutting plants, game handling establishments, cold stores, meat processing plants), which have been inspected by the competent authority of the exporting country and found to meet EU requirements. When it signs the export health certificate, the authority certifies that it provides the necessary guarantees, carries out regular inspections of establishments and takes corrective action, if necessary. A list of approved establishments is maintained by the European Commission.
- For the export of meat from bovine, ovine or caprine animal species (cattle, sheep, and goats) to the EU, exporting countries must apply for a determination of their **Bovine Spongiform Encephalopathy (BSE) status.** This status is based on a risk assessment and is linked to specific BSE-related import conditions.
- Audits by the **DG SANTE** is carried out to verify compliance with the above requirements. Audits establish confidence between the Commission and the competent authority of the exporting country.
- **TRACES NT** (Trade Control Expert System - New Technology) is the EC's online system for sanitary and phytosanitary certification required for the import of animals and animal products into the EU, and for intra-EU trade. **Exporters from third countries who plan to export products of animal origin to the EU must be registered in this system through the EC,** which must be contacted for this purpose by the competent authority of the third country. Detailed rules for operations to be carried out during documentary, identification, and physical checks on animals and goods subject to official controls at border inspection posts and following those controls are defined in the Commission Implementing Regulation (EU) 2019/2130. From 14 December 2019 (date of application of the Regulation on Official Controls - Regulation (EU) 2017/625, the use of the Common Health Entry Documents (CHED) has become mandatory for the entry of animals and goods into the EU under Article 47 of this Regulation. CHED-P is a common medical entry document for consignments of products of animal origin, germinal products, and animal by-products (EC, 2022).

2.1.2 EU import conditions for poultry and poultry products.

EU import rules seek to guarantee that all imports fulfil the same high standards as products from EU Member States - not only with respect to hygiene and all aspects of consumer safety, but also regarding their animal health status. Importation of poultry and poultry products into the EU is subject to veterinary certification – which is based on the recognition of the competent veterinary authority of the non-EU country under EU legislation.

For poultry meat and poultry products from all species, countries of origin must be on a positive list of eligible countries for the relevant product. The main criteria for the non-EU country to be listed and therefore eligible to export to the EU are the same as for fresh meat and meat products described in the 2.1.1 chapter such as **the competent authority,** fulfils the relevant **animal health standards,** the relevant **hygiene and public health requirements** are met, a residue **monitoring plan** for live birds, fresh poultry and products which includes testing **for residues of veterinary drugs, pesticides, heavy metals and contaminants, must be in place and coordinated with DG SANTE.** In addition, approved countries have to notify within 24 hours of outbreaks of avian influenza and Newcastle disease, including also important changes in their health situation, to DG SANTE and must submit virus isolates to the EU Reference Laboratory. A Salmonella control programme must be in place to comply with EU requirements to provide equivalent guarantees for imports of certain poultry commodities as well.

Countries wishing to export live poultry to the EU must have in place adequate avian influenza surveillance programmes. When a country is applying a vaccination policy against avian influenza, under specific conditions certain imports may be permitted. Adequate veterinary services must ensure effective enforcement of all necessary health controls.

Imports are only authorised from approved establishments (e.g. breeding establishments, other holdings, hatcheries), which have been inspected by the competent authority of the exporting country and found to meet EU requirements. The authority provides the necessary guarantees and is obliged to carry out regular inspections. The veterinary authorities must have at their disposal one or more laboratories that comply with certain minimum requirements, ensuring sufficient capability for disease diagnosis.

2.1.3 EU import conditions for milk and milk products.

The import of dairy products from raw milk from non-EU countries is allowed from authorised countries, but different types of heat treatment apply depending on the animal health situation in the country of origin.

Harmonized EU legislation makes it possible to apply the same requirements for the marketing of milk and milk products in all Member States and prevents milk and milk products that can transmit infectious diseases dangerous to livestock or humans from entering the EU.

These principles also apply to consignments that are under EU transit and/or temporary storage procedures. Depending on the risk they may pose, such consignments are exempted from public health requirements but must comply with veterinary requirements.

In general, the products must come from countries that are allowed to enter milk and dairy products into the EU.

For milk and dairy products from all species, countries of origin must be on a positive list of eligible countries for the relevant product. The main criteria for the non-EU country to be listed and therefore eligible to export to the EU are the same as for fresh meat and meat products described in 2.1.1 chapter such as **the competent authority,** fulfils the relevant **animal health standards,** the relevant **hygiene and public health requirements** are met, a residue **monitoring plan** for live animals and dairy products which includes testing **for residues of veterinary drugs, pesticides, heavy metals and contaminants, must be in place and coordinated with DG SANTE.**

In order to export milk and milk products to the European Union, third countries must comply with EU animal health and food safety requirements, rules on animal disease prevention and control. The key aspects of the health status of livestock, other domestic animals and wildlife, the regularity and speed of information on infectious animal diseases provided by the third country to the European Commission and the World Organization for Animal Health (OIE), hygiene requirements for the production, handling, storage, and dispatch of products of animal origin should be implemented.

As regards the **TRACE NT,** the CHED document has several variants (A, P, PP, D), while the CHED-P document is required for the import of dairy products.

2.1.4 EU import conditions for composite products.

Composite products are foodstuffs containing both products of plant origin and processed products of animal origin. The composite products must be manufactured with processed products of animal origin produced in EU-approved establishments located either in EU Member States or in third countries authorised for entry into the European Union of those processed products of animal origin.

The framework legislation on official controls that has applied since 14 December 2019, rules for the entry into the Union of composite products were laid down in Articles 20 to 22 of Commission Delegated Regulation (EU) No 2022/2292[11] and these are due to apply on 21 April 2021. Such rules are proportionate to the risk presented by composite products.

A summary of the requirements applicable to composite products intended to be imported into the EU can be found on the EC website[12].

2.2 EU standards and regulations for selected value chain products

The EU regulations and standards establishes that only safe food and feed can be placed on the Union market or fed to food-producing animals. It also establishes basic criteria for establishing whether a food or feed is safe.

Food safety and quality are crucial aspects of placing food

11. https://eur-lex.europa.eu/eli/reg_del/2022/2292/oj#d1e2084-1-1

12. https://food.ec.europa.eu/system/files/2023-06/ia_ic_composite-prods_table-cp.pdf

products on the market in each country. Consumers must have confidence and assurance that the food they buy will do them no harm or have an adverse effect.

EU regulations and directives establish food safety requirements, and the quality of products, raw materials and quality indicators of products are described in EU marketing standards.

2.2.1 Food Safety.

EU food safety policy is led to the development of the 'Farm to Fork' approach, which seeks to ensure a high level of safety at all stages of the production and distribution process for all food products marketed within the EU, whether produced within the EU or imported from third countries. This body of legislation forms a complex and integrated system of rules covering the entire food chain, from animal feed and health through plant protection and food production, to processing, storage, transport, import and export and retail sales. These rules will be further developed in the context of the Commission's 'Farm to Fork' strategy, which was presented in 2020 as part of the European Green Deal.

Regulation (EC) No 178/2002[13] laying down the general principles and requirements of food law (**General Food Law Regulation**). The General Food Law Regulation is the foundation of food and feed law. It sets out an overarching and coherent framework for the development of food and feed legislation both at the Union and national levels. To this end, it lays down general principles, requirements and procedures that underpin decision making in matters of food and feed safety, covering all stages of food and feed production and distribution. The regulation set out a risk assessment approach and established general traceability provisions for food and feed. It introduced the rapid alert system for food and feed[14], allowing Member States and the Commission to exchange information rapidly and to coordinate their responses to health threats caused by food or feed.

The food business operator is the first responsible for food safety. The role of the competent authority is to supervise and control food businesses to ensure consumers are confident that the food on the market is safe. The supervision and inspections should be risk-based, which means that the level and frequency of official controls consider the performance of the food business operator.
In **Moldova,** the General Food Law Regulation is fully transposed to national legislation (see Annex 2 "Harmonization of EU legislation").

2.2.1.1 Food Hygiene

As part of the 'Farm to Fork' approach, a legislative framework, known as the 'Hygiene Package'[15], was adopted addressing **Regulation (EC) No 852/2004** on hygiene of foodstuffs, **Regulation (EC) No 853/2004** laying down specific hygiene rules for food of animal origin and putting in place a Community framework **Regulation (EU) No 2017/625** on official controls. The Community framework also lays down **Regulation (EC) No 2073/2005** on microbiological indicators for fresh meat, poultry meat, egg products, milk, and milk products. The package puts the responsibility for the hygiene of foodstuffs directly on the various players in the food chain through a self-regulating system using the method of hazard analysis and critical control points (HACCP), which is monitored by means of official controls that must be conducted by the competent authorities.

In Moldova, Law No 296/2017 on general hygienic requirements for foodstuffs establishes general foodstuffs hygienic requirements for food operators, considering the following regulatory aspects: ensuring food safety throughout the food chain; general implementation of procedures based on the principles of Hazard Analysis and Critical Control Points (HACCP), while applying good hygiene practices; development and compliance with the national and international guidelines of good practice at all stages of the food chain, in accordance with food hygienic requirements and with application of HACCP principles. This law transposes Regulation (EC) No 852/2004, Regulation (EC) No 853/2004; transposes Commission Regulation (EC) No 2074/2005; Regulation 854/2004).

2.2.1.2 Food labelling

The legal framework on the labelling of foodstuffs (Regulation (EU) No 1169/2011 is designed to guarantee consumers access to clear, comprehensible, and reliable information on the content and composition of products to protect their health and best interests. Producers must also indicate the origin of unprocessed meat (for certain types of meat other than beef, which already must be labelled for origin) and the presence of food imitations, such as vegetable products replacing cheese or meat. Specific provisions on origin labelling set out the details, requiring (with some exceptions) the indication of the place of rearing and place of slaughter of pre-packaged fresh, chilled, and frozen meat of swine, sheep, goats, and poultry.

13. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32002R0178

14. https://food.ec.europa.eu/safety/rasff_en

15. Official Control – Regulation (EU) 2017/625; Hygiene of Foodstuffs – Regulation 852/2004; Handling of animal origin products – Regulation 853/2004; Microbiological Indicators – Regulation 2073/2005;

The labelling, presentation or advertising of food must not mislead consumers. There are clear rules for authorised nutrition and health claims (such as 'low fat' or 'high fibre' or statements about a relationship between food and health) in the Regulation (EC) 1924/2006. Such claims must be based on scientific evidence and can be found in a public EU register.

In Moldova, Law No 279/2017 on informing consumers about food products sets the mandatory food information to ensure a high level of consumer protection, taking into account their differences in perception and their need for information, including the general objectives and categories of food information, the general requirements for food information and the responsibilities of food operators, as well as the content of the nutrition declaration. This law partially transposes the following EU legal acts: Regulation (EU) No 1169/2011 and Directive 2011/91/EU.

2.2.1.3 Contaminants

Food contamination may occur naturally or result from cultivation practices or production processes. To protect public health, maximum levels for contaminants in food such as heavy metals and dioxins are established and regularly reviewed. Residues in foodstuffs might also originate from food-producing animals that have been treated with veterinary medicines or exposed to pesticides or biocidal products. Maximum residue limits are set and updated periodically. No foodstuffs containing unacceptable quantities of contaminant substances may be marketed in the EU.

2.2.1.4 Microbiological contaminants

In the EU, microbiological criteria for foods, including meat, poultry meat and dairy products, are set in legislation Commission Regulation (EC) No. 2073/2005[16] on microbiological criteria for foodstuffs lists the legal limits for bacterial contaminants.

Compliance with the microbiological criteria of value chain products and their official control and self-control of FBOs is one of the main requirements when supplying products to the national and EU markets. Annex 3 "Microbiological criteria for value chain products" provides detailed criteria for meat, poultry, and dairy products.

In the EU, a framework of legislation on Salmonella has targeted a reduction in the incidence of *Salmonella Enteritidis and Salmonella Typhimurium* in broilers, breeders, and turkeys. Legislation (including Regulation 2160/2003) has been implemented across Member States through National Control Plans and additional national legislation. Principle requirements include registration of premises, minimum sampling requirements for breeders, broilers and turkeys and compulsory slaughter of breeding flocks found to be *Salmonella* positive.

Legislation requires the absence of Salmonella in neck samples from chickens and turkeys after chilling. In the event of unsatisfactory results, improvements to slaughter hygiene, processing controls and/or farm practices may be required. This legislation establishes hygiene criteria for *Campylobacter* as well.

In Moldova, GD No 221/2009 on the approval of rules for microbiological criteria for foodstuffs. These rules lay down microbiological criteria for certain micro-organisms and the mechanisms of application which food business operators must comply with when implementing general and special hygiene measures.

2.2.1.5 Residue

EU countries must implement control plans for residues of pharmacologically active substances to detect the illegal use or misuse of authorised veterinary medicines in food-producing animals and investigate the reasons for residue violations. They also control the presence of pesticide residues and contaminants in food.

Non-EU countries exporting food of animal origin to the EU must also implement control plans for residues of pharmacologically active substances, pesticides and contaminants, which guarantee an equivalent level of food safety.

EU countries must check food-producing animals and food of animal origin for the presence of residues of pharmacologically active substances. The legislation governing the design and implementation of control plans is as follows:

- Commission Delegated Regulation (EU) 2022/1644[17];
- Commission Implementing Regulation (EU) 2022/1646[18];
- Regulation (EU) 2021/808[19] – Rules for validating analytical methods used in the residue control plan and official sample treatment.

16. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32005R2073
17. https://eur-lex.europa.eu/eli/reg_del/2022/1644/oj
18. https://eur-lex.europa.eu/eli/reg_impl/2022/1646/oj
19. https://eur-lex.europa.eu/eli/reg_impl/2021/808/oj

Specific EU Regulation (EU) 2021/808[20] outlines the laboratory analysis and correct interpretation of results. This regulation establishes criteria and procedures to validate analytical methods, ensuring the quality and comparability of the results of official laboratories, common criteria for the interpretation of test results, sampling procedures and official sample treatment. There are some EURL guidance on the implementation of Regulation (EU) 2021/808.

Non-EU countries wanting to export to the EU must ensure the same level of food/feed safety as that of the EU. For more detailed information, please refer to the Manual on residue requirements for non-EU countries exporting to the EU.

In Moldova, NRMP is developed based on Commission Implementing Regulation (EU) 2022/1646 and Delegated Regulation (EU) 2022/1644 in accordance with art. 6 para. (1) of Regulation (EU) 2022 /2292. These Regulations are not harmonized into national legislation, ANSA applied them directly to NRMP. The Standard Operation Procedure for the implementation and monitoring of the NRMP for live animals and products of animal origin is developed by ANSA. The risk criteria applied to the elaboration of NRMP. The sampling is carried out by trained official veterinarians of the territorial subdivisions for food safety. Samples are taken from farms, processing, and production facilities. ANSA plans the appropriate budget to cover the costs associated with the implementation of the NRMP, such as sampling costs, laboratory analyses, necessary personnel, equipment, and other resources. Moldova has initiated the export of certain animal-origin products to the EU. Food Business Operators (FBOs) express a strong desire to increase their exports of animal-origin products. In line with EU import requirements, ANSA is obligated to develop the National Residue Monitoring Plan (NRMP) annually and submit it to DG SANTE. Therefore, the central level of ANSA needs EU countries' experience in developing the NRMP. EU countries have long-lasting experience in risk-based residue control in animal-origin products, which has a significant impact on the protection of consumer health. Best EU practices for the development of risk-based NRMP, including evaluation of hazards, calculation of number of samples and decision on the substances to be investigated, as well as sampling techniques and evaluation of laboratory results, should be considered by ANSA.

There is an approved procedure for sampling and the transportation of samples to the laboratory, including appropriate packaging immediately after sampling, sealing, storage and transportation conditions. ANSA informed, that the last training course related to the sampling procedures for residue in farms and slaughterhouses has been held in the framework of the Twinning Project in 2021 – 2022. The staff of ANSA, including territorial subdivisions, were remotely trained on sampling procedures in farms and slaughterhouses. There is a great need to continue training courses for staff of territorial subdivisions, including practical exercises, on taking the samples of blood and urine in live animals. The distribution of samples at the level of territorial subdivisions should be done by applying the risk criteria for farms and slaughterhouses.

2.2.1.6 Pesticides

Regulation (EC) No. 396/2005[21] establishes the rules governing the setting and the review of pesticide maximum residue level (MRL) at the European level. All foodstuffs intended for human or animal consumption in the EU are subject to an MRL of pesticides to protect animal and human health. EU law regulates which MRLs apply to products of animal origin intended for human or animal consumption and establishes a default MRL where no specific MRL has been established.

These MRLs, which are fixed by the European Commission, include:

- MRLs which are specific to particular products intended for human or animal consumption;
- A general MRL which applies where no specific MRL has been set (a 'default level' of 0.01 mg/kg).

Pesticides indicated in Regulation (EC) No. 396/2005 for poultry, cattle, sheep, and goats are analysed in their muscles, fat tissue, kidney and edible offal. Poultry covers chicken, geese, duck, turkey, Guinea fowl, ostrich, and pigeon.

Member States, according to Commission Implementing Regulation (EU) 2022/741[22] and Regulation (EU) 2022/740[23] develop a coordinated multiannual control programme for 2023, 2024 and 2025 to ensure compliance with maximum residue levels of pesticides and to assess the consumer

20. https://eur-lex.europa.eu/eli/reg_impl/2021/808/oj
21. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32005R0396
22. https://eur-lex.europa.eu/eli/reg_impl/2022/741
23. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R0740

exposure to pesticide residues in and on food of plant and animal origin and repealing Implementing Regulation (EU) 2021/601.

The sampling procedure, including the number of units, shall comply with Directive 2002/63/EC[24].

In Moldova, Regulation (EC) No. 396/2005 is harmonized into national legislation see Annex 2. The last version of this Regulation has not been updated. Analysis of pesticides in animal-origin products is included in the NRMP.

2.2.1.7 Heavy metals and mycotoxins

Commission Regulation (EU) 2023/915 on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006. This new regulation was planned for a long time and presents the contents more clearly through a new structure and integration of the many footnotes. The food listed in the Regulation (EU) 2023/915 shall not be placed on the market and shall not be used as a raw material in food or as an ingredient in food where it contains a contaminant at a level which exceeds the maximum level. Below in the Table 3 the main contaminants related to the value chain products are provided.

Table 3. Monitoring of contaminants according to Regulation (EU) 2023/915 for meat, poultry meat and dairy products

Contaminants	Raw materials and food are regulated according to contaminants
Aflatoxins	Raw milk, heat-treated milk and milk for the manufacture of milk-based products
Lead	Meat of bovine animals, sheep, pig and poultry and their offal
	Raw milk, heat-treated milk and milk for the manufacture of milk-based products
Cadmium	Meat of bovine animals, sheep, pigs and poultry Liver of bovine animals, sheep, pigs, poultry Kidney of bovine animals, sheep, pigs, poultry
Tin (inorganic)	Canned food
Halogenated persistent organic pollutants **Dioxins and PCBs**	Meat and meat products of bovine, ovine and caprine animals, pigs, poultry, rabbits Liver and derived products of bovine and caprine animals, pigs, poultry, or ovine animals Raw milk and dairy products, including butter fat Eggs and egg products, except goose eggs
Perfluoroalkyl substances	Meat and edible offal, meat of bovine animals, pig, poultry, sheep Offal of bovine animals, sheep, pigs and poultry Eggs
Processing contaminants **Polycyclic aromatic hydrocarbons (PAHs) (Benzo(a) pyrene Sum of PAHs: benzo(a) pyrene, benz(a) anthracene, benzo(b) fluoranthene and chrysene)**	Smoked meat and smoked meat products

Source: Elaborated by the authors based on EU Regulation (EU) 2023/915

Sampling and analysis in EU – legal requirements

Official controls as part of the Multi-Annual National Control Plan for contaminants in food should comply with the applicable requirements concerning sampling and analysis, including the following provisions:

- Commission Directive 2002/63/EC establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin and repealing Directive 79/700/EEC;
- Commission Regulation (EC) No 401/2006 laying

24. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ%3AL%3A2002%3A187%3A0030%3A0043%3AEN%3APDF

down the methods of sampling and analysis for the official control of the levels of mycotoxins in foodstuffs;
- Commission Regulation (EC) No 333/2007 laying down the methods of sampling and analysis for the control of the levels of trace elements and processing contaminants in foodstuffs (could also be used for analysis of mercury in food in accordance with Regulation (EC) No 396/2005, see point 4);
- Commission Regulation (EU) 2017/644 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs 4;
- Commission Implementing Regulation (EU) 2022/1428 laying down methods of sampling and analysis for the control of perfluoroalkyl substances in certain foodstuffs.

2.2.1.8 Food contact materials

Constituents of food contact materials that transfer from these materials into the food may affect the chemical safety of the food and affect human health, as well as the quality of the food, its taste and smell, and its appearance.

To ensure a high level of food safety, all food contact materials must comply with Regulation (EC) No 1935/2004[25] on materials and articles intended to come into contact with food when placed on the European market.

In addition to this Regulation, all FCM must be manufactured in accordance with Good Manufacturing Practices (GMP, Regulation (EC) No 2023/2006[26]), and specific Union legislation on certain materials, including on plastic and ceramics, as well as with National legislation on other materials.

In Moldova, the main Regulation (EC) No 1935/2004 and Regulation (EC) No 2023/2006 are transposed to the national legislation, therefore the FBOs should implement the rules, materials and articles intended to come into contact with food to be used as intended.

2.2.2 EU Marketing standards

EU marketing standards[27] contribute to high-quality standards for EU agri-food products. EU marketing standards for agri-food products have been effective in establishing a standardized and satisfactory quality while also being useful for stakeholders. EU marketing standards aim to establish a standardized and satisfactory quality for agri-food products available on the EU market. To do this, they set out technical definitions, classification, presentation, marking and labelling, packaging, production method, conservation, storage, transport, related administrative documents, certification and time limits, restriction of use and disposal. They apply at all stages of the marketing chain and are intended to protect consumers and facilitate the trade of applicable goods on the single market. These standards are usually sector-specific for a broad range of sectors, including poultry, eggs, dairy products, and meat.

EU marketing standards are coherent with the other aspects of the common agricultural policy as well as with other EU-relevant rules. They also provide significant added value in addition to international and private standards because of their mandatory nature and being tailored to the EU context.

Products subject to marketing standards regulations include **beef, eggs in shells, hatching eggs and chicks, poultry meat and milk and spreadable fats.**

Figure 20. Regulations of Common Markets Organizations (COM)

Key EU Legislation

CMO Regulation (EU) No 1308/2013

Secondary CMO Regulation

Eggs (EC) No 589/2008	Hatching eggs poultry chicks (EC) No 617/2008	Poultry meat (EC) No 543/2008	Bovine meat (EC) No 566/2008	Spreadable fats, milk products (EC) No 445/2007	Dairy pr. Comm. Decision (2010/791/EU)

Source: Elaborated by the authors

25. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32004R1935
26. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:384:0075:0078:EN:PDF
27. https://agriculture.ec.europa.eu/news/eu-marketing-standards-contribute-high-quality-standards-eu-agri-food-products-2020-10-27_en

In case there are no quality indicators for animal-origin products regulated by EU marketing standard, the Member State can adopt national requirements, and this national legislation should be notified to the EC and agreed upon between Member States (MS). Therefore, there are different approaches to detailed quality indicators of some animal-origin products in the MS, thus creating trade barriers for FBOs. Some MS has national legislation related to specific quality requirements of animal-origin products.

To avoid technical barriers to trade, the EC has implemented **the TRIS system[28] which is guided by the statement "Don't let barriers stop your success".** MS notify the European Commission of their draft legislation relating to foodstuffs. The Commission analyses them considering EU legislation. M participate in this procedure on an equal footing with the Commission and can also express their views on notified projects.

2.2.2.1 Bovine meat marketing standards

There are two main EU bovine meat marketing regulations:

- Regulation (EU) No 1308/2013[29] establishing a common organization of the markets in agricultural products;
- Commission Regulation (EC) No 566/2008[30] laying down detailed rules for the application of Council Regulation (EC) No 1234/2007 as regards the marketing of the meat of bovine animals aged 12 months or less.

Regulation (EU) No 1308/2013 is a general regulation in which there are foreseen categories for meat of bovine, sheep aged from 8 months to more.

Table 4. Union scale for the classification of carcasses of bovine animals aged eight months or more

Category	Description
Z ("Young cattle")	Carcasses of animals aged from 8 months to less than 12 months
A ("Young bulls")	Carcasses of uncastrated male animals aged from 12 months to less than 24 months
B ("Bulls")	Carcasses of uncastrated male animals aged from 24 months
C ("Steers")	Carcasses of castrated male animals aged from 12 months
D ("Cows")	Carcasses of female animals that have calved
E ("Heifers")	Carcasses of other female animals aged from 12 months

Source: Elaborated by the authors based on EU Regulation (EU) 1308/2013

There are also conformation classes of bovine animals: S – superior, E – excellent, U – very good, R – good, O – fair, P – poor.

Commission Regulation (EC) No 566/2008 describes the requirements of bovine meat marketing. The age of the animal on slaughter and the sales description should, at each stage of production and marketing, be indicated on the label. Moreover, to ensure transparency towards the final consumer, the indication of the animal's age on slaughter and the sales description should be presented in the same visual field and on the same label at the moment of the release of the meat to the final consumer. Operators at each stage of the production and marketing should record indications of any person from whom they have been supplied with the meat of bovine animals aged 12 months or less.

To verify, official checks should be carried out, which should also include the supervision of the classification of the bovine animals in slaughterhouses.

Meat of bovine animals aged 12 months or less and imported from third countries is only marketed in accordance with that Regulation.

This requires that the competent authority designated by the third country concerned, or failing that, an

28. https://technical-regulation-information-system.ec.europa.eu/en/home

29. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1308

30. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008R0566-20130701

independent third-party body, should approve and control an identification and registration system of the bovine animal, which guarantees the respect of the provisions of that Regulation.

Only independent third-party bodies that are accredited to certain standards should be allowed to check the activities of operators from third countries wishing to place on the Community market meat of bovine animals aged 12 months or less.

2.2.2.2 Poultry meat marketing standards

The EU imports high-value poultry products, including breast meat and poultry preparations, mainly from Brazil, Thailand, and Ukraine, while the EU exports poultry products of lower value. As was mentioned in this Study analysis, Moldova is expected to be approved for fresh poultry meat by the EC. Therefore, FBOs of poultry meat should implement quality requirements in slaughterhouse and processing entities.

There are two main EU poultry meat marketing regulations:

- Regulation (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products;
- Commission Regulation (EC) No 543/2008 regards the marketing standards for poultry meat.

Imported poultry meat must comply with the EU's marketing standards[31], as set out in Regulation (EC) No 543/2008. The Regulation states that imported poultry meat bearing specific optional indications must be accompanied by a certificate issued by the competent authority of the country of origin indicating compliance with EU marketing standards.

Marketing standards for poultry are designed to improve the quality of the product, protect the consumer, and make sure that standards are consistent throughout the EU marketplace. These standards lay down detailed rules that poultry products must satisfy to be marketed in the EU. In general, they stand for sales descriptions, quality grading, limits of technically unavoidable water content in poultry meat absorbed during processing, definitions and labelling of various alternative methods of poultry production.

In order to export poultry meat to the EU, the slaughterhouses and cutting plants should implement grading of poultry carcasses and cuts as classes A and B. There are differences between classes: A - good conformation, the breast is well developed, minor damages, contusion and discolouration are permitted; B - the tolerable number of defective units is doubled. Official control should be carried out based on classes and additional water in carcasses. Given that water content is of particular interest in the marketing of frozen or quick-frozen poultry, the maximum water content is fixed, and a monitoring system should be established.

In Moldova, the most recent training on quality marketing standards for **poultry meat and eggs** was held online for ANSA staff and FBOs by Twinning Project in 2021 – 2022. The experts of MS presented the grading of poultry carcasses and cuts in classes A and B, official control system, laboratory test for additional water control. Representatives of FBO informed that they will need transitional period for implementation of grading poultry meat in classes.

2.2.2.3 Marketing standards for egg

There are two main EU egg marketing regulations:

- Commission Regulation (EC) No 589/2008[32] of 23 June 2008 regards marketing standards for eggs;
- Regulation (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products.

Rules on marketing standards for eggs[33] are clearly explained on the EC website. Eggs can be classified as either Class A or Class B. Class A eggs must have the following characteristics: a normal-shaped shell that is clean and undamaged; an air space inside the egg no bigger than 6 mm; a yolk that does not have a clear visible outline and is slightly mobile upon turning the egg; the white must be clear and translucent; the egg must not contain foreign matter or smells; the egg must not display germ development.

Class A eggs must not be washed or cleaned before or after grading, and they must not be treated for preservation or chilled below 5°C. Class A eggs are graded by weight: XL - more than 72 g, L - 63-72 g, M - 53-62 g, S - less than 53 g.

Class B eggs are those that do not meet the quality thresholds of class A eggs, or they are Class A eggs that have been downgraded.

Only packing centres can grade and pack eggs as well label their packs. Packing centres must have the appropriate equipment to grade and mark the eggs. Eggs must be graded, marked, and packed within 10 days of laying.

31. https://agriculture.ec.europa.eu/farming/animal-products/poultry_en
32. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008R0589
33. https://eur-lex.europa.eu/EN/legal-content/summary/rules-on-marketing-standards-for-eggs.html

Egg transport packaging must be marked with the producer's name and address, the producer code, the number of eggs and/or their weight, the laying date or period, the date of dispatch.

Packs containing Class A eggs must be marked with the farming method used and the date of minimum durability - not more than 28 days after laying.

Eggs can be labelled as 'free range eggs', 'barn eggs' or 'eggs from caged hens. Free-range hens must have continuous daytime access to open-air runs; however, farmers may sometimes restrict access in the mornings in accordance with good animal husbandry practice. 'Eggs from caged hens' means that the hens have been kept in enriched cages, as battery cages (known as 'unenriched' cages) have been prohibited in the EU since 2012 (Council Directive 1999/74/EC).

The words 'extra' or 'extra fresh' may be used to indicate higher quality on Class A eggs until 9 days after laying.

Egg producers must keep records on the farming method used, the number and age of hens, the date of culling and number of hens culled, the number or weight of eggs sold per day, and the names and addresses of purchasers.

2.2.2.4 EU marketing standards for dairy products

Marketing regulation

There is one main EU dairy products marketing regulation – Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products.

The European Union (EU) has established marketing standards for dairy products to ensure the quality and safety of these products in the European market. These standards are designed to protect consumers. Here are some key points regarding EU marketing standards for dairy products:

Milk: The EU sets quality standards for raw milk, including requirements for temperature, fat content, somatic cell count, and bacterial count. Various types of milk, such as cow's milk, sheep's milk, and goat's milk, have their own specific quality standards.

Dairy Fat Products: Butter: EU standards specify the minimum milk fat content for butter, which is typically 80%. **Cream:** Cream products must meet specified fat content requirements. **Ghee:** Ghee is subject to specific requirements, including a minimum milk fat content.

Cheese: Various types of cheese have specific regulations governing their production, ingredients, and characteristics. For example, the standards to produce "Parmigiano-Reggiano" and "Roquefort" cheese are well-defined. Cheese quality standards may include parameters like moisture content, fat content, and aging requirements.

Yogurt and Fermented Milk Products: Yogurt and similar products are subject to standards regarding ingredients, live lactic acid bacteria content, and more.

Labelling and Packaging

Dairy product labels must accurately represent the product's content and characteristics. Packaging requirements, including labelling in multiple languages, and providing nutritional information, may also apply.

2.2.3 EU import documentation requirements

2.2.3.1 General legal requirements for non-EU countries for the import of live animals and animal products for human consumption into the EU

Food imported into the Community for placing on the market within the Community shall comply with the relevant requirements of Food law[34] or conditions recognized by the Community to be at least equivalent thereto or where a specific agreement exists between the Community and the exporting country, with requirements contained therein.

The EU's animal health and food certification system is covered in a more extensive authorization, monitoring, certification, and traceability system. Each element of this system ensures that only healthy animals can be transported, and food produced from healthy animals and safe must be placed on the market. FBOs and farms shall implement EU animal health, food safety (HACCP), and traceability rules on the spot. A system of traceability and food chain information ensures that different pieces of information can be shared with all actors along the food value chain if needed.

To ensure traceability, products of animal origin must be produced in a registered or approved establishment. Checks on the products may also be carried out at the destination.

34. https://food.ec.europa.eu/horizontal-topics/general-food-law_en

Commission Implementing **Regulation (EU) 2020/2235**[35] lays down rules as regards model animal health certificates, model official certificates and model animal health/official certificates for entry into the Union and movements within the Union of consignments of certain categories of animals and goods, official certification regarding such certificates. Therefore, when Moldova's FBOs are ready for the export of animal-origin products, including composite products or live animals, the model official certificates should be reviewed in line with EC rules.

In addition to the general animal health requirements, specific requirements for products of animal origin may be required during evolving disease situations in the EU Member States. Specific animal health certificates are needed in those cases.

Country (MOLDOVA) listing – the process for import to the EU

FBOs of the poultry sector in Moldova are eagerly awaiting EC approval to export fresh/frozen poultry meat to the EU. The business lacks information about why the process of importing to the EU is so long; it takes about 10 years. To clarify for companies, below are the main steps of the EC process for importing fresh poultry into the EU.

Steps for import fresh/frozen poultry meat to the EU:

1. The competent authority (CA) of a non-EU country must submit a written request to the Directorate General for Health and Food Safety of the European Commission (DG SANTE) to export animal-origin products to the EU. The request should contain confirmation that the authority can fulfil all relevant legal provisions to satisfy EU requirements.

   ANSA officially provided the request to export fresh poultry meat and class A eggs to the DG SANTE.

2. DG SANTE sends a general and/or product-specific questionnaire to the competent authority, which should be completed and returned. The completed questionnaire(s) will provide information on relevant national legislation on animal health and food hygiene, the structure of the competent authorities, etc.

   ANSA officially provided the completed questionnaires on requested topics (animal health, food safety, residues, and the national Salmonella control programme).

3. A residue monitoring plan of the exporting country must also be submitted to the Commission. The EC should approve the plan. If the EC does not approve the plan, animal-origin products may not be imported into the EU regardless of the non-EU country's compliance with other public health or animal health requirements.

   ANSA each year provides the NRMP, which covers animal-origin products (poultry meat, egg) intended to be exported to the EU to the EC.

4. After the evaluation of the information provided, an audit by the Commission's Health and Food Audits and Analysis Directorate may be carried out to assess the situation on the spot.

   All DG SANTE audit reports are published on the EC website[36]**, and the implementation status of recommendations is published, too.**

5. If the results of the evaluation/audit and the guarantees given by the exporting country are deemed to be sufficient, the DG SANTE proposes the listing of the non-EU country and any specific conditions under which imports from that country will be authorised. In parallel, it will draft a list of approved establishments in the country. These are then discussed with representatives of all EU Member States.

   The EU has authorized Moldova to export honey and caviar and, from 2021, dairy products that have undergone heat treatment, egg products, certain fishery products, snails, gelatine, and collagen from poultry meat and poultry meat that have undergone heat treatment.

6. If the Member States have a favourable opinion on the proposal, the European Commission will list both the non-EU country and any specific import conditions which apply. Lists of eligible establishments can be amended at the request of the exporting country and are made available to the public on the internet[37].

   As soon as the EC approves the country for the permit to import fresh/frozen poultry meat into the EU and the permit is in force, ANSA, after assessing the company's compliance with the EU requirements, will be able to approve and submit to the EC for inclusion in the lists of approved companies.

35. https://eur-lex.europa.eu/eli/reg_impl/2020/2235/oj

36. https://ec.europa.eu/food/audits-analysis/audit-report/details/4533

37. https://webgate.ec.europa.eu/sanco/traces/output/non_eu_listsPerActivity_en.htm

2.2.3.2 EU requirements for import certificates

In the European Union, import certificates and their requirements are described in detail. EU Regulations which are related to entry into the Union, the movement and handling after entry of consignments of certain animals, products of animal origin, model animal health certificates, model official certificates and model animal health/official certificates as follows:

Commission Delegated Regulation (EU) 2020/692 regards rules for entry into the Union and the movement and handling after entry of consignments of certain animals, germinal products, and products of animal origin[38].

Commission Implementing Regulation (EU) 2020/2235 regards model animal health certificates, model official certificates and model animal health/official certificates for the entry into the Union, movements within the Union of consignments of certain categories of animals and goods, official certification regarding such certificates[39].

Commission Implementing Regulation (EU) 2022/2293 regards the list of third countries with an approved control plan on the use of pharmacologically active substances, the maximum residue limits of pharmacologically active substances and pesticides and the maximum levels of contaminants[40].

All certificates are always built the same way and require information, as documented in the Table 5.

Table 5. Required information for EU certificate

Required information for European Certification	
identification of responsible Veterinarian	place of dispatch and destination
central/local competent authority of the country of origin	information about origin and destination (country, region)
identification of exporter/ sender	transport conditions (temperature, means and identification)
identification of importer/receiver	purpose of import or transport
identification of operator (transporter)	description of consignment
place of loading	place of dispatch and destination

Source: Elaborated by the authors based on EU Regulations

Common health entry document

To enable the traceability of animals across borders, the EU developed the Trade Control and Expert System (TRACES NT). This provides a central database for tracking the movement of animals and food of animal origin both within the EU and imported from third countries. In the event of a disease outbreak, TRACES ensures that all potentially affected animals can be quickly identified and that authorities can take appropriate measures. For each consignment of animals and goods entering the EU, the operator responsible for the consignment must pre-notify the arrival of a consignment with a so-called common health entry document (CHED) available at the TRACES platform, which is equivalent to animal health certificates. This CHED must be submitted to the Border Control Post to enter the EU. In the next step, the Border Control Post of entry into the EU processes the common health entry document.

Moldova is an active participant in the EU's TRACES (NT), and the EU and Moldova have agreed on a series of harmonised certificates that may be used by EU Member States when exporting animal products to Moldova.

Veterinary certificates and other documents

For the trade and certification of animals and animal products with the EU or between EU member states, a veterinary certificate must accompany all consignments of animals or animal products. These documents must be signed by an official veterinarian of the competent authority, guaranteeing that the conditions for domestic trade and import into the EU have been met. Additional requirements might be set by specific labels (e.g., the participation in quality labels, geographical origin of products, and specification of farms from which raw material was used). However, the certification and

38. https://eur-lex.europa.eu/eli/reg_del/2020/692/oj
39. https://eur-lex.europa.eu/eli/reg_impl/2020/2235/oj
40. https://eur-lex.europa.eu/eli/reg_impl/2022/2293

documentation process cover the whole production chain and is valid for delivery independent of the scope.

According to Regulation (EU) 2017/625, the veterinary certificates must be signed by an official veterinarian of the competent authority. According to the definition, an official veterinarian is a veterinarian authorized by the veterinary authority of the country to perform certain designated official tasks associated with animal health or public health and inspections of commodities. The responsibilities and duties of an official veterinarian are described in detail in the legal act.

Animal Health

The Animal Health Law (AHL) has been implemented with Regulation (EU) 2016/429. The legislation has a horizontal, thematically oriented structure. It includes delegated regulations on, for example, the registration of farms and the identification of animals, surveillance, eradication programs and disease-free status, prevention and control, the movement of terrestrial animals, and imports from third countries. The rules cover animal diseases in all kept animals and animal products. They do not directly cover animal welfare, although the link between the health of the animals and their welfare is recognized and considered when considering the impact of the disease.

In Moldova, the Animal Health Law, according to Regulation (EU) 2016/429, is in the process of harmonization with national legislation.

The Commission Delegated Regulation (EU) 2020/692 lays down specific animal health requirements for non-EU countries, supplementing the measures of the AHL. These include the requirements for freedom from specific diseases (e.g., foot and mouth disease and Classical or African Swine Fever), residency periods in the country of origin, requirements for establishments of origin, or health requirements for the animals).

Traceability and animal identification

Traceability in the FBOs is a risk management tool that allows operators or authorities to withdraw or recall products that have been identified as unsafe. It is the most critical aspect of the EU's food safety policy. Under Regulation (EU) 178/2002, "traceability" means the ability to track any food, feed, food-producing animal, or substance that will be used for consumption through all stages of production, processing, and distribution. Traceability is compulsory for all food and feed businesses. It requires that all food and feed operators implement special traceability systems. They must be able to identify where their products have come from and where they are going (the principle of one step forward and one step back) and to provide this information to the competent authorities when requested rapidly.

Live animals should not only be traceable but also must be identified in the scope of the traceability system. That means producers must "tag" animals and record their location. When animals are moved to a new location, including a slaughterhouse, the movement and new location are also recorded, thereby allowing tracing of all locations where an animal has been during its lifetime. The tools used (ear tags, passports, bar codes) may vary from one country to another and between animal species but must carry the same information.

In Moldova, legal provisions on traceability are transposed into national legal acts. The identification, registration and traceability of animals are regulated by Law No 231/2006 on the identification and registration of animals and GD No 1093/2007 for the approval of the Regulation on the procedures and documents related to the Animal Identification and Traceability System. Partially transposes the provisions of Commission Regulation (EC) No 1082/2003 of 23 June 2003, laying down detailed rules for the implementation of Regulation (EC) No 1760/2000 regards the minimum level of controls to be carried out in the framework of the system for the identification and registration of bovine animals; and Commission Regulation (EC) No 1505/2006 of 11 October 2006 implementing Council Regulation (EC) No 21/2004 as regards the minimum level of checks to be carried out in relation to the identification and registration of ovine and caprine animals.

In Moldova, FBOs and farms are approved according to national legislation, which is harmonized with EU regulations (Regulation 882/2006; Regulation 853/2006; Regulation 852/2006). There is a list of FBOs and farms that have been approved. To protect consumers' rights, there is an unsafe product recall system from the market. Moldova has a national contact point for communication with the EU Rapid Alert System for Food and Feed (RASFF) team, as well as a procedure for tracking notifications forwarded through the RASFF system.

ANSA is responsible for animal identification and registration of live animals.

Public health

A comprehensive legal framework has been established by the European Commission to increase the level of food safety in Europe, which is based on scientific advice delivered by the European Food Safety Authority.

Imported food needs to comply with the same standards. For veterinary certification, the public health attestation is related to information regarding TSE, Residues, Thyrostatic substances, Oestrogenic, androgenic, gestagenic or beta-agonist substances, Salmonella control program, Basic hygiene principles, HACCP, Meat inspection, Handling procedures (e.g. storing, cooling, heating treatment).

The specific requirements differ between animal species and between types of products of animal origin.

Animal welfare

The EU certificates require animal welfare attestations for 2 categories. The first attestation applies to live animals and requires confirmation of fitness for transport of the animals at the time of loading. The second category applies to meat, for which it must be stated that animals have been handled in the slaughterhouse before and at the time of slaughter or killing in accordance with the relevant provisions of Union legislation or equivalent requirements.

In Moldova, GD No 677/2008 for the approval of the sanitary-veterinary norms regarding the protection of laying hens, transposes Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens and lays down minimum requirements for laying hen rearing systems, improved and unimproved cage rearing systems, alternative free access between levels or with access to outdoor spaces. The growth in unenriched cages was allowed only until January 1, 2012, but due to insufficient financial resources for an adequate subsidy to farmers, this method of growth is still allowed.

Poultry

In the EU: For poultry, different categories of certification are used.

The disease agents of concern in the animal health attestation for poultry are highly pathogenic avian influenza virus, Newcastle disease, Salmonella spp.

The public health attestation is required for all poultry certificates and specifies salmonella surveillance programmes and residue plans.

Hatching eggs

In the EU, the certificate applies to the importation of hatching eggs (species other than ratites). A public health attestation for a salmonella surveillance program is required. The diseases of concern are highly pathogenic avian influenza, Newcastle disease, and Salmonella Enteritidis/ Typhimurium. Pathogenic microorganisms must not be present.

Animal products for human consumption: Import dairy products

In the EU, the European legislation categorizes the certificates for dairy products as follows: Milk products with pasteurization treatment and specific risk-mitigating treatment other than pasteurization.

The main public health measurements required in the certificates are applicable measures for pasteurised/heated milk products somatic cell count, microbiologic criteria, HACCP, heat treatment, storing conditions, cooling conditions and residue monitoring.

The diseases of concern for all dairy products are Tuberculosis, Brucellosis, Foot and mouth disease, and rinderpest.

Meat

In the EU, for poultry meat, the European legislation differentiates between the animal species and between mechanically separated meat and non-mechanically separated meat. For poultry meat, only one certificate exists, however, a dedicated certificate for separated poultry meat is in preparation.

In all meat certificates, specific slaughter, cooling, and handling processes are required.

The main public health measurements required in the certificates for poultry are meat inspection, HACCP, residue plans, cooling conditions, and identification mark.

Eggs

In the EU, for the import of eggs intended for human consumption, the certificate applies. In the public health attestation for the egg certificate, a confirmation for salmonella surveillance and residue plans is required. The animal health diseases of concern are highly pathogenic avian influenza and Newcastle disease.

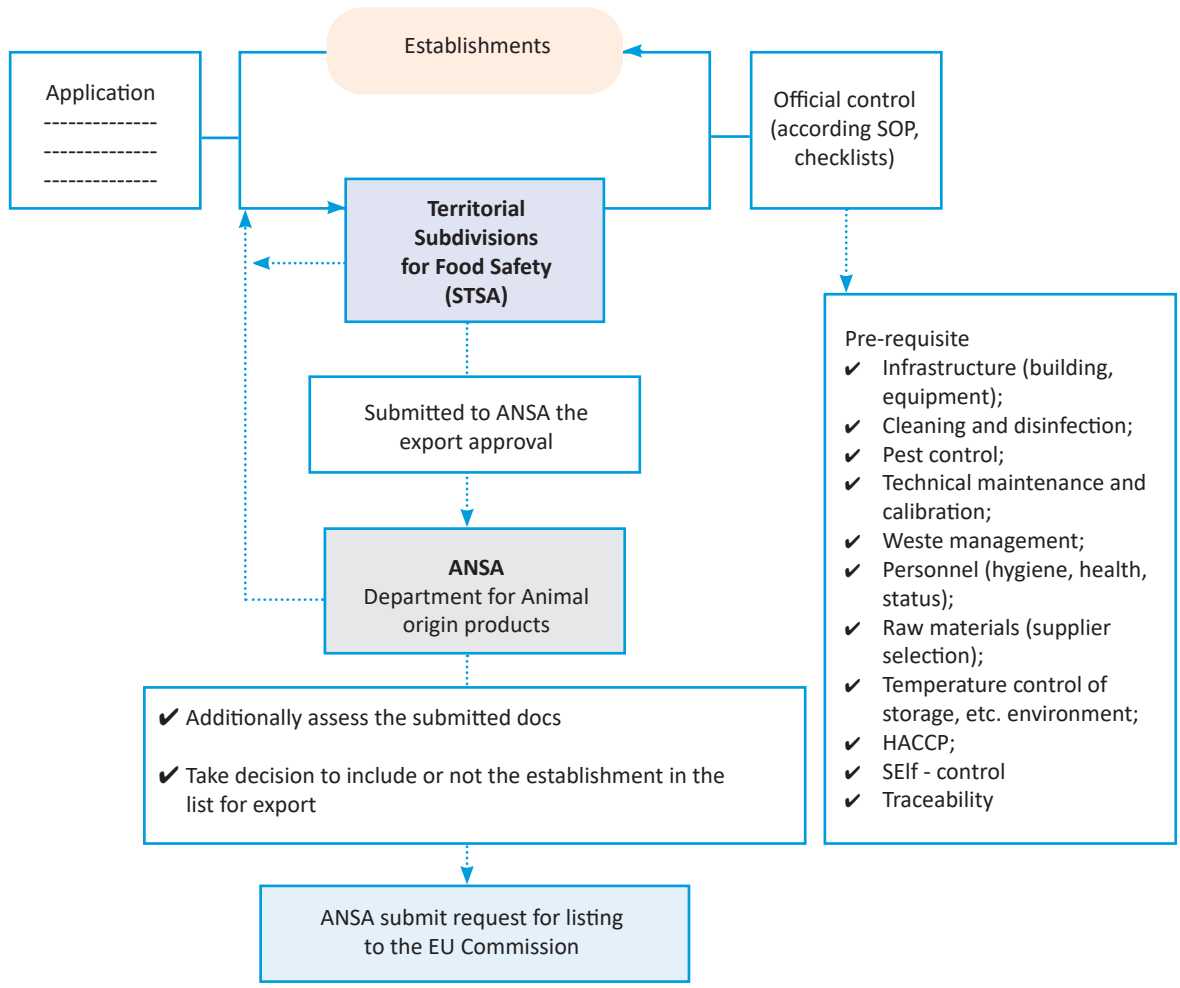
Moldova's veterinary health certificates for animal-origin products for human consumption that are in the TRACE system are aligned with the EU veterinary health certificates.

2.2.3.3 The certification process of animal-origin products in Moldova for export to the EU

ANSA and STSA are involved in the process of certification of animal-origin products for export to the EU. The certification system and approval of FBO are organised

by standard operation procedures approved by the ANSA General Director. It means all processes are described in detail, and official veterinarians are following them in all regions. The single approach is applied. Below is a graphical representation of the certification process for the approval of FBO for export to the EU.

Figure 21. Procedure for the approval of FBO for export to the EU



Source: Elaborated by the authors and ANSA

Procedures for export certification require sanitary veterinary certificates depending on the destination area. For the export of products of animal origin for human consumption, a district official veterinarian issues a sanitary-veterinary certificate for the export to CIS countries or for the export to other countries than CIS. For the export into the EU, the certificates are received by the TRACES system. Following an inspection at the border by a veterinary border inspector, the border inspector will inspect the sanitary-veterinary certificate for the export of products of animal origin.

Each consignment of products of animal origin intended for export is subject to certification and is accompanied by an original veterinary certificate issued by the inspector of the STSA, so the certification of the consignment of products should accompany it to the destination.

Annually, the list of the official veterinarians allowed to issue and sign the sanitary-veterinary certificates in the TRACES system is developed and approved by an order of the Director General of ANSA. Training courses for official veterinarians are organised by donors. Strengthening the

capacities for the certification process to the EU, including taking samples for animal origin products, would be helpful for regional units.

According to ANSA data, in 2020-2023 animal-origin products were exported, accompanying the veterinary certificates to the countries being provided below in the Table 6.

Table 6. Information regarding the export of products of animal origin in 2020-2023

No.	The name of the exported product	Country of destination
1	Ice cream	Saudi Arabia, Iraq, United Arab Emirates, Mali, Togo, Kosovo, Ghana, Senegal, Romania, Germany, Turkey
2	Cheese and cottage cheese	Kazakhstan, Russian Federation
3	Eggs	Liberia, Gambia
4	Beef	Kazakhstan, Uzbekistan, Russian Federation
5	Mutton	Liberia, Iraq, Jordan
6	Bird meat	Azerbaijan, Iraq
7	Honey	France, Italy, Czech Republic, Poland, Spain, Romania, Austria, Serbia, Germany, Norway, UK, Macedonia, Slovakia, US
8	Caviar	Germany, Spain, Switzerland
9	Snails	Italy, Romania

Source: Elaborated by authors according to ANSA data

More detailed information about country-coordinated certificates is placed on ANSA website[41].

41. https://www.ansa.gov.md/ro/content/import-export#tab-0-2

3.

Assessment of national capacities of meat, poultry, and dairy production

3.1 Moldovan potential assessment (livestock, statistics, trends)

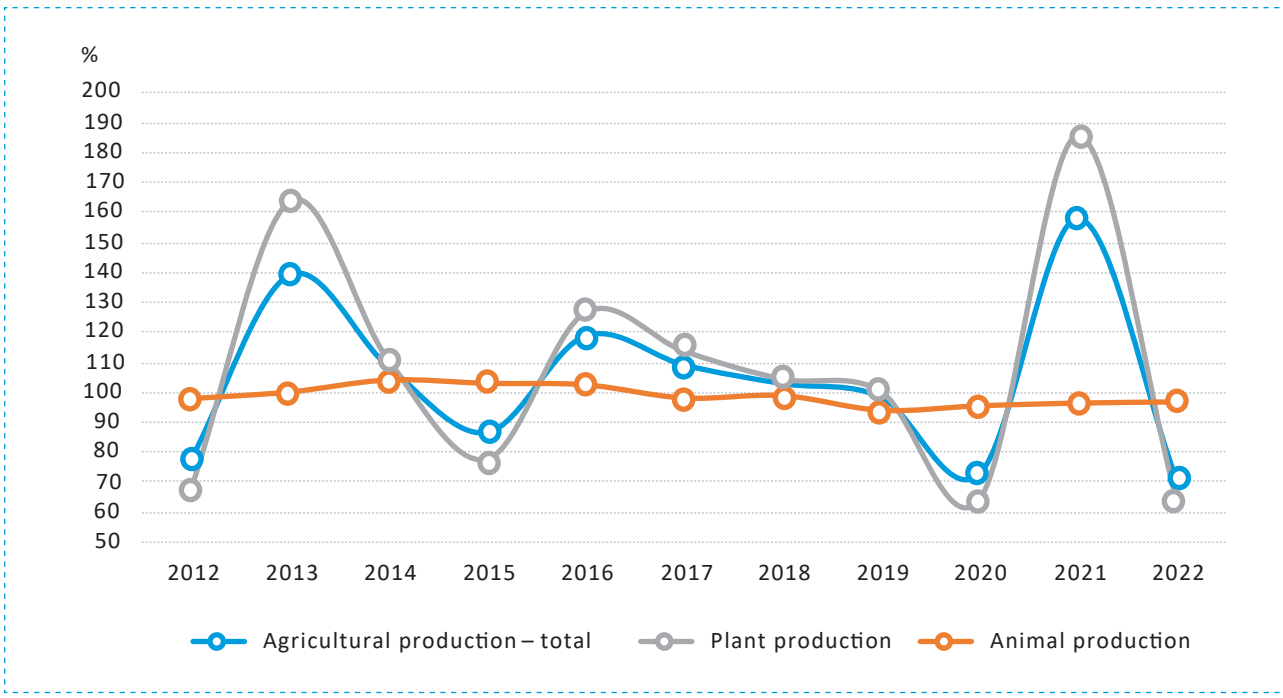
The global agricultural production

The global agricultural production, in all categories of producers (agricultural enterprises, agricultural households (farms) and households) in 2022, according to The National Bureau of Statistics, marked 70.8% (in comparable prices) compared to 2021. The decrease of the global agricultural production was determined by the decrease in vegetable production by 35.9% and in animal production - by 3.2%.

In Moldova, the evolution of global agricultural production is mostly influenced by the evolution of plant production and to a lesser extent by animal production. In the year 2022, the share of plant production in the total agricultural production accounted for 72% (in 2021 – 80%), while animal production accounted for 28% (in 2021 – 19%).

Generally, the share of animal production varies between 20-35%, and these deviations are largely driven by significant fluctuations in plant production. In the last decade, animal production has remained practically the same, with a slight declining trend starting from 2017.

Figure 22. Volume indices of agricultural production in all categories of producers[42] (previous year = 100)



Source: NBS

42. Data are presented for all enterprises producing agricultural production, including those, with the agriculture as secondary activity.

Categories of Agricultural Holdings in Moldova

In the agricultural sector, there are three major categories of holdings (entities or households) in terms of organizations, which are classified by the NBS, namely: (i) Agricultural enterprises, which are Enterprises that produce agricultural products; (ii) Peasant Farms, and (iii) Households.

(i) Enterprises

Agricultural enterprises include all enterprises and organizations which carry the status of a legal person producing agricultural products, who owns or uses agricultural land and carries out agricultural activities, regardless of legal form or type of ownership. This category includes both companies that practice agriculture as their main activity and those that practice agriculture as a secondary activity (within their structural subdivisions). According to their legal form, agricultural enterprises include agricultural production cooperatives (CAP), joint stock companies (SA), limited liability companies (SRL), state enterprises (IS) etc.

(ii) Peasant Farms

A peasant farm is a legal form of agricultural activity carried out by individuals who predominantly use their own land plots and patrimony to produce, process and sell agricultural products.

The activity of peasant farms is regulated by the Law No. 1353-XIV of 3 November 2000 "On peasant Farms", which defines the status of a peasant farm as an individual enterprise (legally registered but still with a status of a natural person) and regulates the various aspects of its activity. Particularly, the law stipulates that a peasant farm uses the personal labor of family members, who are the members of a peasant farm. Peasant farms can also hire non-family workers on individual employment contracts. Peasant farms have the right to a stamp and a bank account and are obliged to keep simplified accounting records and to regularly submit simplified fiscal reports.

Peasant farms can be considered semi-subsistence in nature, and a significant number of them have a clearly commercial orientation, while individual households produce mostly for self-sufficiency. Peasant farms also can be called private family farms with a commercial orientation, as they rely heavily on family labor.

(iii) Households (rural households)

Households (rural households) and their family members carry out agricultural operations on a small scale – primarily for subsidence to meet their own needs for food – on household plots and on so-called "gardens" (small land plots adjacent to the village and received during the land reform by some categories). Most households are subsistence and semi-subsistence with a non-commercial orientation. Moldovan Households (rural households) may be considered as equivalent to the international term Backyard farms.

Livestock: trends & potential

The Republic of Moldova experienced the highest level of development in its livestock sector during the late 1980s and early 1990s. During this period, there were notable increases in the populations of bulls, pigs, sheep, and poultry, as well as their productivity. This led to higher overall production of milk, meat, and other livestock products.

However, in the subsequent years, the livestock sector, like other branches of agriculture, faced challenges related to inefficient management and unsuccessful agrarian reforms. These issues contributed to a decline in the performance of the livestock sector. Addressing these challenges and implementing effective agricultural policies would be crucial for revitalizing and modernizing the livestock industry in Moldova.

Bovine population (incl. dairy cows)

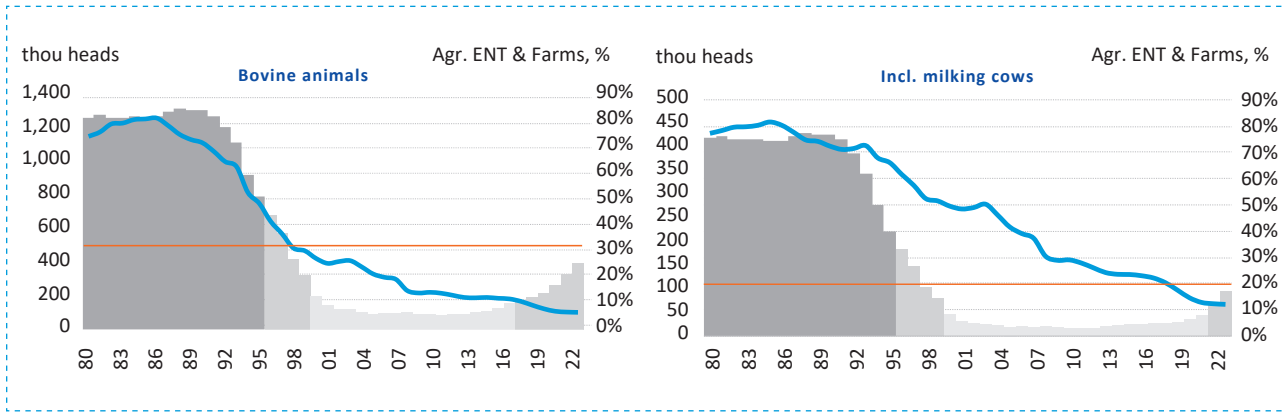
In 1990, the cattle herd in Moldova consisted of 1,112 thousand heads, including 402 thousand cows. At that time, agricultural enterprises and peasant households (farmers) collectively owned 84% of the cattle herd and 77% of the cows.

Following 1990, the cattle (bull) breeding sector experienced significant challenges, which led to a decline in bull herds and the production of both milk and beef. **Between 1990 and 2000, the cattle herd owned by agricultural enterprises and peasant households saw an alarming average annual decrease of 24.6%.**

During this challenging period, many households turned to raising cattle and cows for their own consumption and to sell any surplus. Consequently, the number of cattle in private households increased at an average annual rate of 7.4%, with an even more significant increase of 10.5% in the case of cows, over the period from 1990 to 2000.

In just one decade, from 1990 to 2000, the total cattle population was reduced by 62%, with agricultural enterprises and farmers experiencing an even more substantial decline of 94%. Out of the total cattle population of approximately 423 thousand heads population, agricultural enterprises and farmers owned just around 13%, which was a substantial decrease compared to their 84% ownership share at the beginning of 1990.

Figure 23. Developments of bovine populations (incl. dairy cows), 1980-2023



Source: NBS

The decline in the cattle population persisted into the 2000s, with average annual rates of decline reaching 6.3% during the period from 2000 to 2010. This decline was observed in both agricultural enterprises and peasant households, with a decrease of 13.3%, as well as in households, where the decline was 5.5%.

Since 2010, the overall livestock population has continued to decrease, with an average annual decline rate of 5.8%. This was primarily due to a reduction in livestock ownership by households, which experienced an average annual decline rate of 7.4%. As of January 1, 2023, the total cattle population had decreased to 102.4 thousand heads, including 67.1 thousand cows. This was a significant decrease from January 1, 2010, when the cattle population stood at 221.6 thousand heads, including 161.2 thousand cows.

Indeed, in the last 13 years, there has been an increase in the number of cattle owned by agricultural enterprises and peasant households. The cattle herd grew from 13.2 thousand heads at the beginning of 2010 to 26.1 thousand heads on January 1, 2023, and it now represents around 25% of the total cattle population. This development marks a positive change in the trend compared to the previous decades.

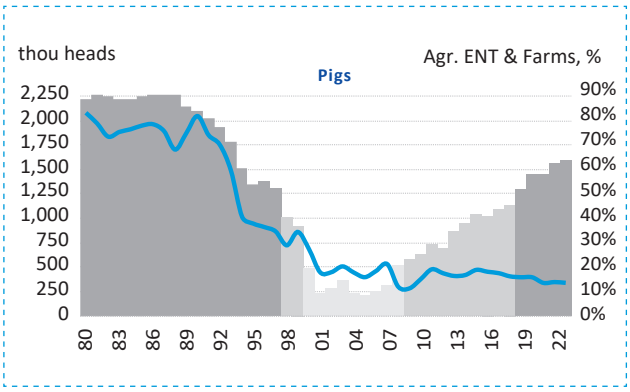
As of January 1, 2023, the total number of cows stood at approximately 67.1 thousand heads. This number represents an 83% reduction compared to 1990 and a 76% reduction compared to 2000. Only around 17% of these cows are owned (as indicated on the balance sheet) by agricultural enterprises and farmers.

Pig population

The pig population in agricultural enterprises and farms households saw a significant decline, with an annual average decrease of approximately 22.5% during the years from 1990 to 2000. In this decade, the total number of pigs dropped by around 62%, and the share of agricultural enterprises and farms decreased from roughly 84% to 20%.

Starting from 2000, the rate of decline in the pig population slowed down, averaging about 3% annually. This slowdown was mainly due to a substantial reduction in pig numbers owned by the households (approximately 6.3% annual decline). During the same period, the population of pigs in agricultural enterprises and farms increased by an average of 2.1% annually. As a result, their share in the total pig population also grew to about 64%.

Figure 24. Developments of pig populations, 1980-2023



Source: NBS

As of January 1, 2023, the total number of registered pigs was approximately 340 thousand heads, representing a significant decrease of 83% compared to 1990 and 50% compared to 2000.

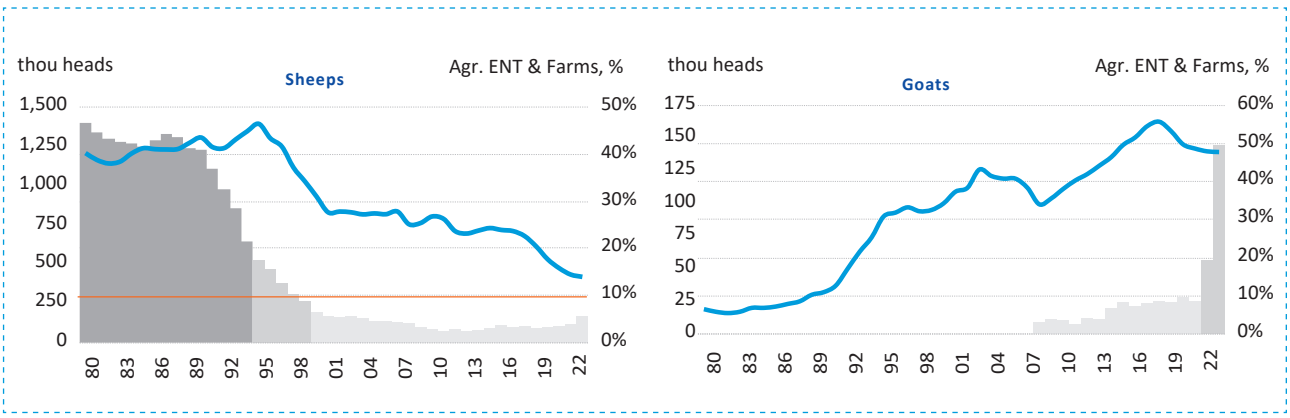
Sheep and goats' population

Sheep breeding is traditionally dominated by the segment represented by households. Even in the 1980-1990 period, agricultural enterprises concentrated only about 40-45% of the total population.

In these conditions, the aggressive decrease in the number of sheep from agricultural enterprises and peasant households from the period 1990-2000 (on average of approx. 19.5% annually), while the number of sheep in households remained approximately the same, affected less the total population.

Between 2000 and 2023, the number of sheep decreased in both categories of producers. As of January 1, 2023, there were approximately 419,000 sheep in total, with about 94% of them being owned by households.

Figure 25. Developments of sheep and goats' populations, 1980-2023



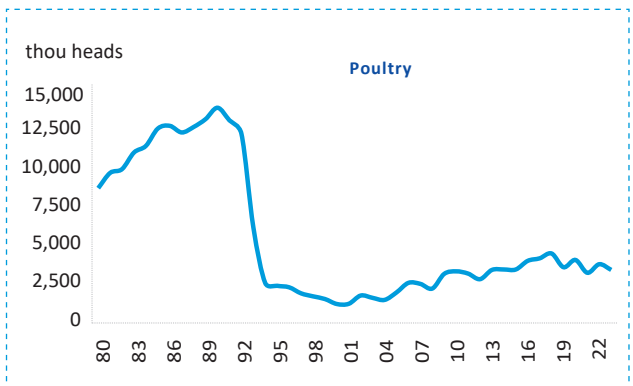
Source: NBS

Goats are the only animal category with a consistently growing population in Moldova throughout the entire period, starting from a low initial base. This increase in goat herds can be attributed to households raising goats to secure their domestic consumption of dairy products and meat while also generating surplus products for sale.
As of January 1, 2023, the National Bureau of Statistics (NBS) reported that there were approximately 139.4 thousand goats in Moldova. The vast majority, about 95%, were owned by households.

Poultry

The period from 1990 to 2000 witnessed a significant reduction in the number of poultry within the agricultural enterprises, characterized by an annual average decline of around 21.6%.

Figure 26. Developments of number of poultry birds within the agricultural enterprises, 1980-2023



Source: NBS

The period from 2000 to 2010 was a ten-year phase of limited recovery, marked by relatively modest growth, with an average annual increase of approximately 10.5% in the poultry population.

Starting January 1, 2010 and ending January 1, 2023 there has been only a marginal increase in the number of birds, with an average annual growth rate of just 0.2%. Consequently, the poultry population has been maintained within the range of 3.4-4.0 million birds.

In conclusion, the agricultural reforms that occurred in the Republic of Moldova after 1990 led to the dissolution of farms and zootechnical complexes that had been implementing advanced scientific and technological practices in cattle and pig farming. These complexes were involved in the production of milk and meat, heifer breeding for reproduction, and the upgrading of herds with more productive animals.

As a result of these changes, most of the livestock, including 75% of the total cattle herd, 83% of cows, and around 95% of sheep and goats, are currently owned by households. These households often use outdated methods for animal husbandry and breeding, and they have limited access to modern technologies and advancements in science and technology.

However, in the case of pigs, agricultural enterprises, and peasant households (farmers) have a majority share, accounting for approximately 64% of the pig population. This shift occurred in 2019 as a response to the significant reduction in the number of pigs in households. These developments highlight the challenges and changes in livestock ownership and management in the Republic of Moldova following the agricultural reforms.

The processing and analysis of the data obtained from the State Register of Animals (RSA), held by ANSA through the public institution CRDV, regarding livestock, have revealed some discrepancies between the figures provided by ANSA and those presented by the National Bureau of Statistics (NBS). According to ANSA, the differences are the results of the following:

- In March 2023, ANSA transitioned to a new RSA system, and data migration is still in progress;
- The time gap between the occurrence of an event and its registration in the system, as observed in the case of animal slaughter;
- Incorrect registrations in the system, linked in some cases to veterinarians' limited proficiency in using the system;
- The inclusion of animals of advanced age in the system (e.g., over ten years old), which should be excluded from calculations or records.

ANSA is fully aware of these existing issues and is actively taking steps to address them. **On November 22, 2023, the Government approved measures aimed at enhancing animal identification and registration procedures. The draft Decision, developed by the National Agency for Food Safety (ANSA), received official approval.** The new provisions encompass regulations that grant direct access to animal farm administrators or other designated individuals for recording data on animals or events related to them in the Integrated Information System for Food Safety (SIISA). These adjustments align with the conditions and needs of contemporary society.

These nominated changes are anticipated to contribute significantly to the accurate assessment of livestock, encompassing updated events – a crucial factor in the formulation of policies in the field. Furthermore, they will support the implementation of the Program of strategic actions for the surveillance, prophylaxis, and combating of animal diseases.

3.2 Production

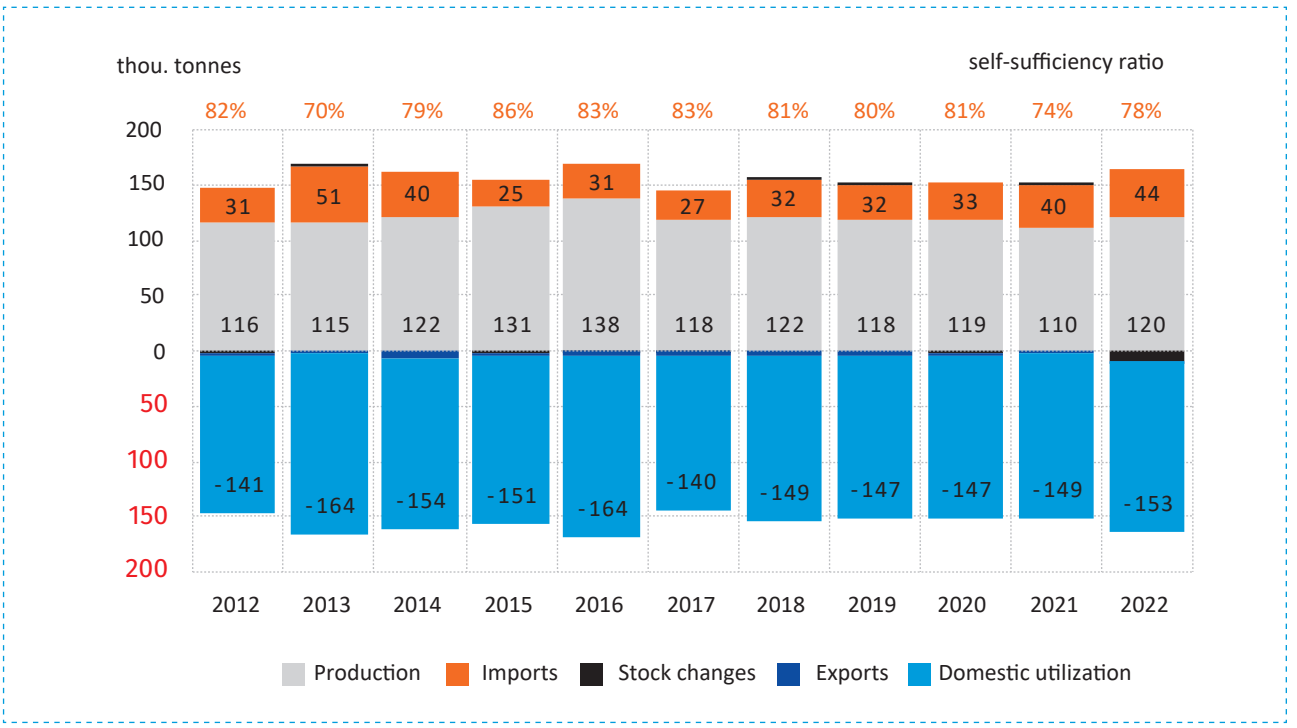
3.2.1 Agricultural production

Meat

Meat production[43] output from all categories of producers (including agricultural enterprises, farms, and households) amounted to 120 thousand tons in 2022.

Pigmeat was the most significant meat category: 55% of annual production of all meats, followed by poultry meat with 38%. Bovine meat production accounted for only about 8% in 2022.

Figure 27. The balances sheet for meat, Republic of Moldova[44]



Source: NBS (The balances of food resources and their use)

Statistics on livestock for slaughter (in live weight) show that approximately 62% of the total meat production, regardless of category, originates from agricultural enterprises and farms, while about 38% comes from individual households within the population. This represents a significant shift from the situation in 2012.

In 2012, only 28% of meat production came from agricultural enterprises and farms, with the majority being produced by individual households (72%).

The average annual per capita meat consumption in 2022 was 60.8 kg, the highest since 2016. In general, there is a growing trend in meat consumption across all meat categories. The self-supply level for meat is approximately 80%, indicating that domestic production cannot entirely meet the country's internal meat consumption, leading Moldova to import some meat.

43. Meat production data includes information on the actual weight of meat, as well as gross fat and by-products of categories I and II.

44. This data contains both primary products in their fresh state and the derived products, which are recalculated into the primary product using transformation coefficients.

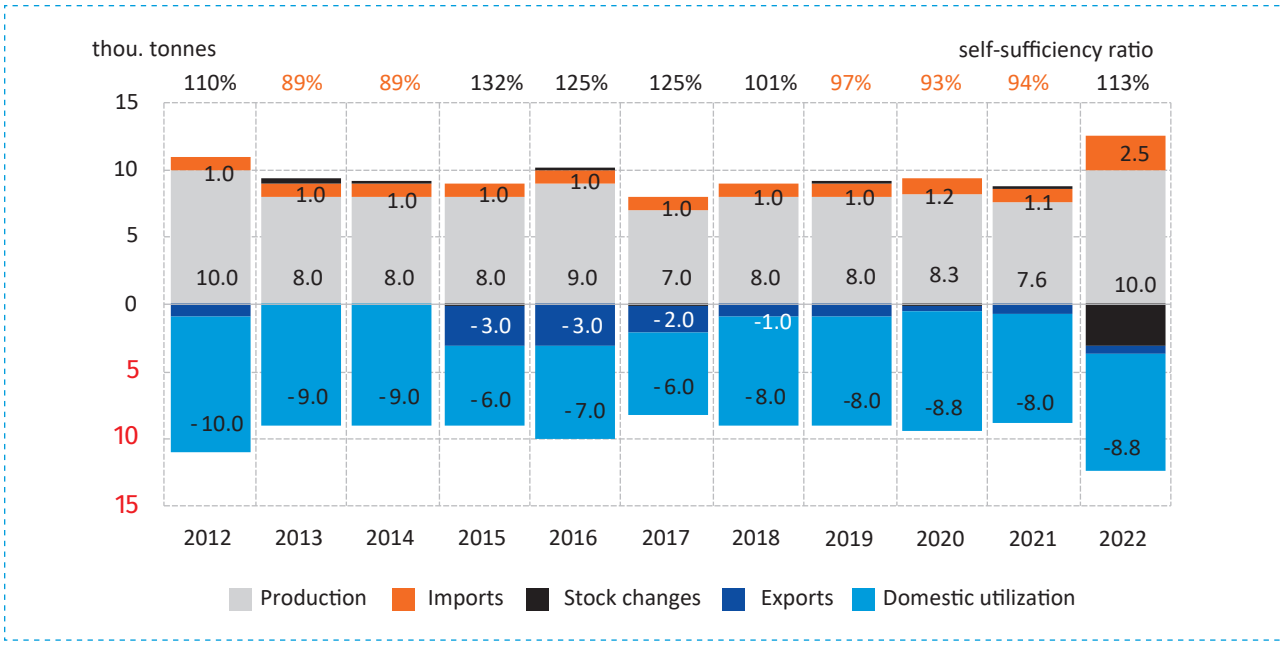
Beef and veal meat

In recent years, there has been a slight increase in beef production, with approximately 10,000 tons produced in 2022, resulting in a self-sufficiency rate of 113%.

Statistics on livestock for slaughter (in live weight) indicate that around 69% of beef production is attributed to agricultural enterprises and farms, while approximately 31% comes from individual households within the population. This represents a significant shift from the situation in 2012.

In 2012, only 14% of beef production came from agricultural enterprises and farms, with the majority of production originating from individual households (86%). The average annual per capita consumption was 3.5 kg in 2022, showing an increase compared to recent years.

Figure 28. The balances sheet for beef and veal meat



Source: NBS (The balances of food resources and their use)

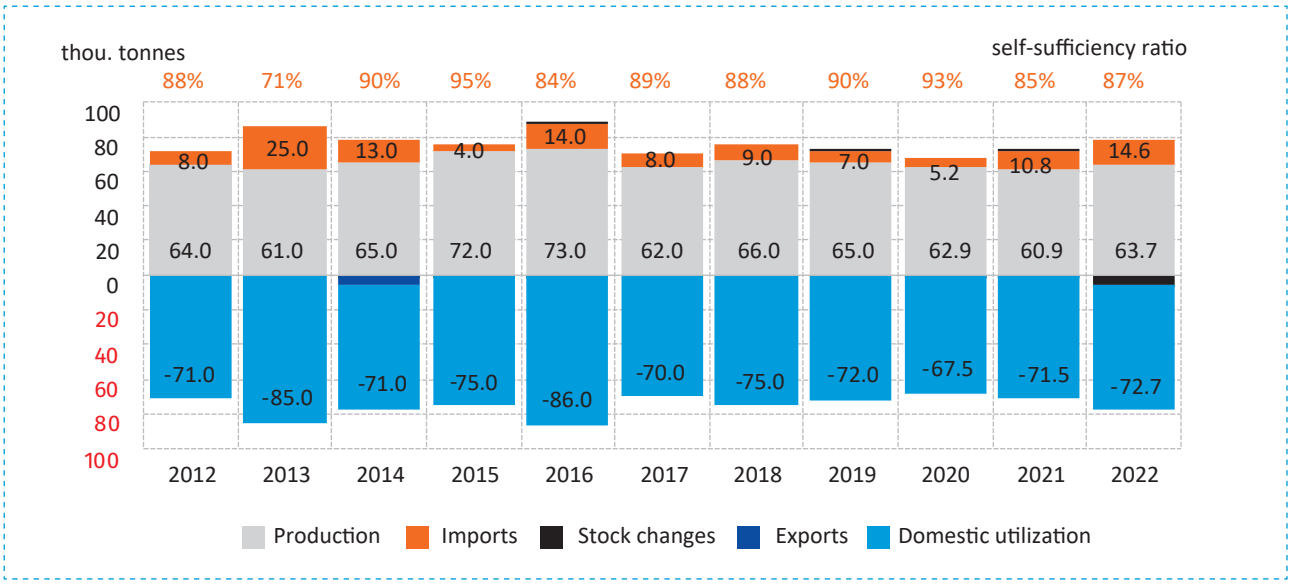
Pork meat

In 2022, pork production reached 63.7 thousand tons, with a degree of self-sufficiency of 87% and imports of 14.6 thousand tons.

Approximately 57% of pork production is attributed to agricultural enterprises and farms, and about 47% comes from individual households within the population. This represents a significant transition from the situation in 2012 when the ratio was 22% versus 78%, indicating a shift from individual household production to specialized agricultural enterprises with more advanced technologies and methods.

The average annual per capita consumption was 29 kg in 2022, showing a slight increase compared to the figures of recent years.

Figure 29. The balances sheet for pork meat

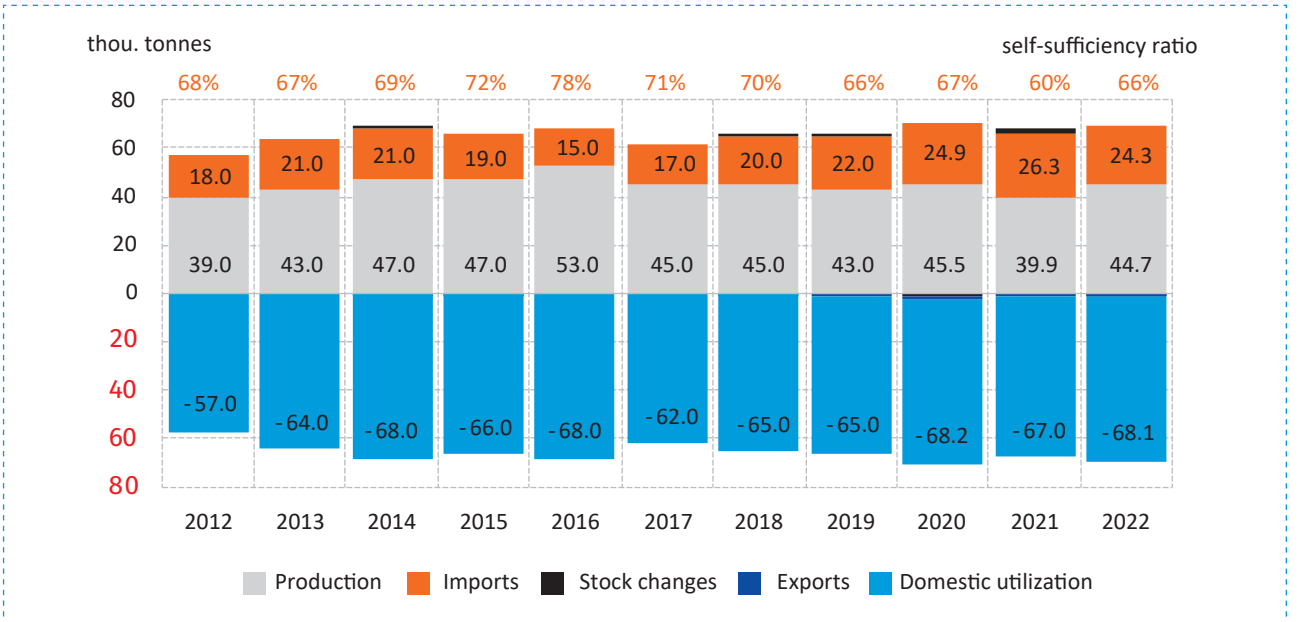


Source: NBS (The balances of food resources and their use)

Poultry meat

In 2022, poultry meat production reached 44.7 thousand tons, with a self-sufficiency rate of only 66%. The import of poultry meat was the largest among all meat categories, amounting to 24.3 thousand tons in 2022.

Figure 30. The balances sheet for poultry meat



Source: NBS (The balances of food resources and their use)

Agricultural enterprises and farms accounted for approximately 75% of the total volume of poultry meat in 2022, a significant increase compared to about 44% in 2012.

The average annual per capita consumption was 27.1 kg in 2022, marking the highest consumption in recent years.

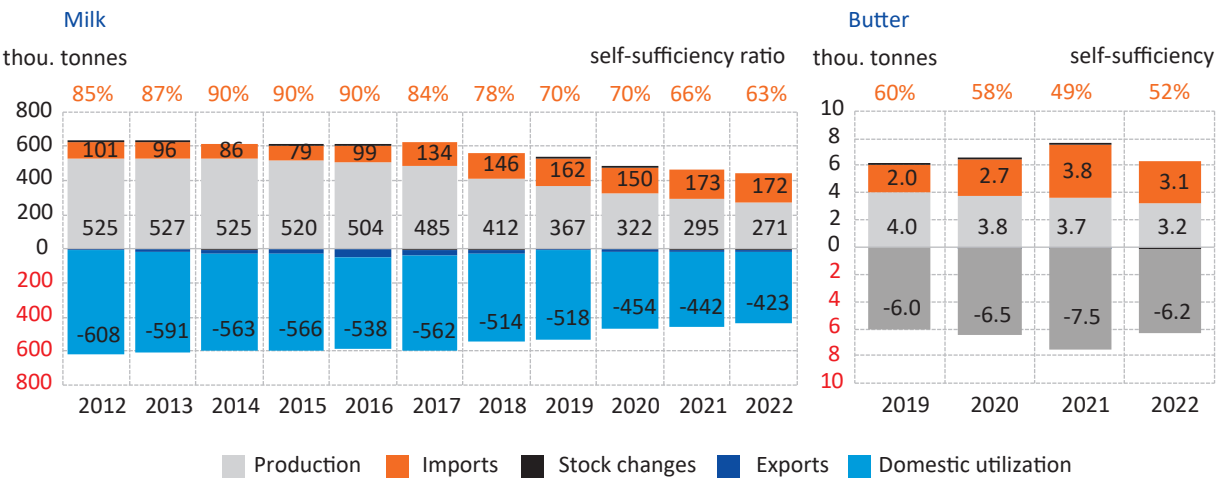
Milk and butter

In 2022, Moldova registered a negative record, with the lowest milk production at approximately 271 thousand tons. Over the last 10 years, milk production has nearly halved (-48% compared to 2012), while imports have increased by 70%. In these conditions, the self-sufficiency level reached a historic low of only 63%.

Most of the milk production, around 85% in 2022 (97% in 2012), comes from individual households within the population.

The average annual per capita consumption was 168.4 kg in 2022, representing the lowest level ever recorded.

Figure 31. The balances sheet for milk and butter



Source: NBS (The balances of food resources and their use)

In 2022, local butter consumption was equally met by domestic production and imports, with a little over 3 thousand tons each. Recent years clearly indicate a reduction in local butter production and an inevitable increase in butter imports.

The self-sufficiency level was 96% in 2022, and in the last 4 years, local production has not been able to fully meet the country's domestic consumption.

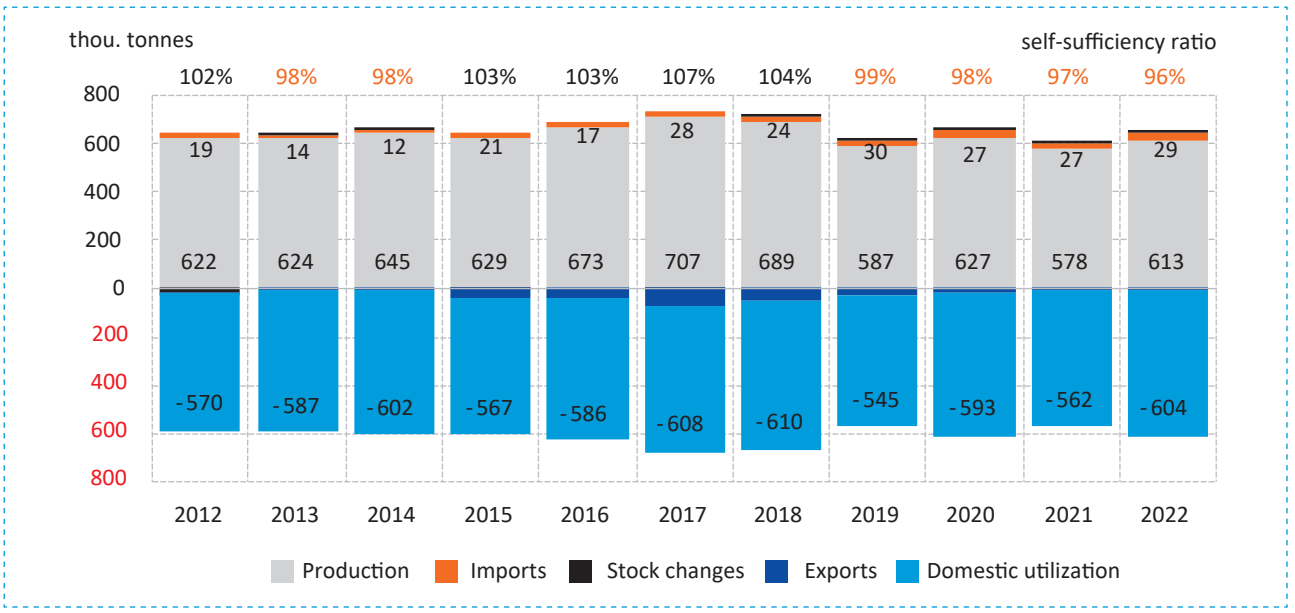
Eggs

In 2022, egg production amounted to approximately 613 thousand pieces. Over the past decade, a trend of decreasing egg production and increasing imports has emerged.

Around 57% of the total egg production came from individual households within the population, with agricultural enterprises and farms contributing about 43%. This structure experienced minor changes compared to 2012 when the ratio was 61% versus 39%.

The average annual per capita consumption was 241 eggs in 2022, marking the highest figure since 2016.

Figure 32. The balances sheet for (poultry) eggs



Source: NBS (The balances of food resources and their use)

3.2.2 Industrial production

According to NBS Metadata regarding industrial product statistics, industrial production is defined as follows:

- The direct and valuable outcome of extracting raw materials and materials from nature;
- The result of primary processing of agricultural and forestry products;
- The outcome of subsequent processing on industrial products.

Industrial production includes finished products, semi-finished products, and industrial works (services). These items serve various purposes, such as population consumption, export, domestic productive consumption, and other needs of the national economy. They are identified by codes in the PRODMOLD-2013 nomenclature.

Production of main animal products by categories of producers, for the period 2012-2022 is presented in the table below.

Table 7. Production of main animal products by categories of producers, 2012-2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Meat, thou. tonnes	31.0	34.5	43.1	44.6	44.2	54.3	60.1	60.5	67.6	63.2	70.7
Poultry meat, thou. tonnes	16.7	21.3	26.6	28.5	29.6	36.2	40.5	40.8	40.6	37.6	45.8
Pork meat, thou. tonnes								13.5	21.3	20.1	21.0
Bovine meat, thou. tonnes								4.4	3.3	3.2	2.3
Sheep and goat meat, thou. tonnes								0.9	0.8	0.8	0.4
Sausages, thou. tonnes	15.9	17.2	16.3	17.2	16.4	18.4	19.7	21.2	22.3	25.5	29.5
Canned meat, thou. tonnes	1.5	0.9	0.7	0.5	0.5	0.5	0.6	0.5	0.6	0.5	0.7
Milk and cream with fat content < 6%, thou. tonnes	62.4	65.3	78.7	80.0	86.0	80.0	69.1	61.3	56.5	55.4	48.0
Solid milk and cream, thou. tonnes	0.5	0.4	1.0	1.4	1.7	2.5	2.3	0.9	1.0	0.6	0.6
Butter, thou. tonnes	3.8	4.2	4.7	4.8	5.9	4.8	3.9	3.9	3.8	3.7	3.2
Fat cheese and brynza, thou. tonnes	2.1	2.4	2.4	2.5	2.4	2.9	2.8	2.6	2.9	3.0	2.7
Curdled milk, cream, yogurt and other fermented products, thou. tonnes	27.3	30.2	31.5	32.7	32.7	31.1	29.5	29.5	27.8	28.0	27.0
Ice-cream and other edible ice, whether or not containing cocoa, mil. litres	14.1	15.2	15.6	16.0	16.5	17.0	17.6	16.9	13.2	13.2	15.7

Source: NBS

3.3 Import, and export activities

3.3.1 Live animals (HS 01)

Exports

Moldova primarily exports two products from the category of live animals: live bovine animals and live sheep and goats.

Table 8. Moldova exports of live animals, 2013-2022

Code Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exported value, US Dollar thousand										
'0102 Live bovine animals	6,293	4,721	9,599	9,528	6,774	11,262	9,382	9,602	6,926	6,081
'0104 Live sheep and goats	882	1,692	532	552	1,022	392	625	345	256	40
Exported quantity, Tons										
'0102 Live bovine animals	3,124	2,236	6,289	6,135	4,114	6,299	5,617	5,780	3,702	3,048
'0104 Live sheep and goats	380	731	402	419	895	326	396	209	135	14

Source: ITC Trade Map

In 2022, Moldova exported 3,048 tons of live bovine animals, amounting to a total value of USD 6,081 thousand. This volume represents the lowest quantity of live bovine animals exported since 2015.

The Arab World stands as the primary market, with Lebanon emerging as the dominant leader, contributing to approximately 72% of the exports in both value and volume.

In addition to Lebanon, Moldova also found export opportunities in two other markets in 2022: Egypt and Iraq. These countries accounted for 20% and 9% of the total export volume, respectively.

Over the past decade, Moldova has also engaged with other significant markets, including Azerbaijan, Jordan, Libya, the State of Libya, the Syrian Arab Republic, and Turkey. It's worth noting that the Arab market, excluding Lebanon, exhibits considerable volatility. There are specific years, or even multiple years, where Moldova's exports to certain countries within the region are substantial, contrasted by other years when exports become insignificant or even non-existent.

Over the past five years, the export of live sheep and goats from Moldova has consistently declined, reaching a historical low point in 2022, with just 14 tons valued at a total of 40 thousand USD. In 2022, the sole market for these exports was Lebanon.

Over the past three years, Moldova has witnessed consecutive historic lows in the export of live sheep and goats. The highest recorded export volume in the last decade occurred in 2017 when approximately 900 tons of live sheep and goats were exported, with a total value of around 1,022 thousand USD. These exports were primarily destined for countries such as Lebanon, Jordan, Libya, the State of Palestine, and the Syrian Arab Republic.

The disappearance of important markets from the last decade, such as Jordan, Libya, and the Syrian Arab Republic, in recent years, underscores the volatile nature of these markets and the challenge local producers face in maintaining and strengthening their positions in foreign markets.

Imports

Moldova primarily imports three products from the category of live animals: live swine, live bovine animals, and live poultry ("fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls), and live sheep and goats.

Table 9. Moldova imports of live animals, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Imported value, US Dollar thousand											
'0103	Live swine	3,702	6,639	4,897	3,003	3,678	2,022	1,517	1,006	1,257	3,840
'0102	Live bovine animals	2,091	2,781	1,067	1,560	202	584	1,937	3,318	1,649	2,673
'0105	Live poultry, "fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls"	2,357	5,928	2,015	1,835	2,160	1,913	1,774	1,611	2,264	1,853
'0104	Live sheep and goats	386	1,574	72	11	0	60	97	32	160	27
Imported quantity, Tons											
'0103	Live swine	1,146	1,889	1,658	1,017	1,142	600	435	167	196	1,391
'0102	Live bovine animals	421	618	301	413	52	129	482	1,484	586	817
'0105	Live poultry, "fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls"	167	468	208	144	157	121	103	108	138	93
'0104	Live sheep and goats	45	195	7	1		9	12	4	21	2

Source: ITC Trade Map

In 2022, Moldova imported 1,391 tons of live swine, amounting to a total value of 3,840 thousand USD. The primary import markets in recent years have been Hungary, Germany, and Denmark.

Despite a significant decrease in imports over the past two years, Ukraine remains the primary import market for live bovine animals, accounting for 375 tons in 2022 (46% of the total volume). Other notable import markets include Romania, Denmark, and Germany, with import quantities ranging from 90 to 115 tons and corresponding values ranging from 400 to 600 thousand USD.

Hungary stands out as the primary import market for live poultry, specifically live fowls of the Gallus domesticus species weighing <= 185 g, excluding turkeys and guinea fowls. In 2022, Hungary accounted for 63% of the total imported volume and 68% of their total value.

Other significant import markets include Slovakia and Romania, jointly representing approximately 28% of the import volume and around 23% of the import value.

Furthermore, Moldova engaged in smaller-scale imports from Poland, the Netherlands, and the Czech Republic in 2022.

Trade Balance

Live bovine animals and live sheep and goats are the only products in the category of live animals with a positive trade balance.

Table 10. Moldova trade balance for live animals' trade, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance in value, US Dollar thousand											
'0102	Live bovine animals	4,202	1,940	8,532	7,968	6,572	10,678	7,445	6,284	5,277	3,408
'0104	Live sheep and goats	496	118	460	541	1,022	332	528	313	96	13
'0106	Live animals (excl. horses, asses, mules, hinnies, bovine animals, swine, sheep, goats, poultry, ...	-141	-244	-156	-210	-278	-253	-217	-279	-287	-166
'0105	Live poultry, "fowls of the species Gallus domesticus, ducks, geese, turkeys and guinea fowls"	-2,357	-5,928	-2,015	-1,835	-2,160	-1,913	-1,774	-1,611	-2,264	-1,853
'0103	Live swine	-3,702	-6,639	-4,897	-3,003	-3,678	-2,022	-1,517	-1,006	-1,257	-3,840

Source: ITC Trade Map

3.3.2 Meat and Edible Meat Offal (HS 02)

Exports

The top two products from the meat and edible meat offal category that Moldova have consistently exported over the last decade are: meat of bovine animals, frozen and meat of sheep or goats, fresh, chilled, or frozen.

The export data from the past 10 years reveals that exports of meat of bovine animals, frozen were notably influenced by the situation in the Russian market, with the vast majority being specifically exported to Russia.

Russia remains the primary export market in 2022, with 264 tons of meat of bovine exported, totalling a value of 1,432 thousand USD. However, these exports have significantly decreased compared to 2015-2017, with volumes dropping by 6-8 times and values declining by 3-4 times.

Until 2019, only frozen bovine carcasses and half-carcases were exported to the Russian market. Instead, in the last 3 years, Russia exclusively imports frozen, boneless meat of bovine animals.

Starting from 2019, Moldova has also begun exporting meat of bovine to Uzbekistan. In 2022, export volumes reached 141 tons, valued at 513 thousand USD (compared to 301 tons in 2020 and 697 tons in 2021). The primary exports to this market include frozen bovine carcasses and half-carcasses, as well as smaller quantities of frozen bovine cuts with bone in, excluding carcasses and half-carcasses.

Azerbaijan and, particularly, Iraq are two markets to which Moldova had previously exported significant volumes of frozen, boneless bovine meat. Moldova lost access to these markets in the last 2-4 years.

Table 11. Moldova exports of meat and edible meat offal, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exported value, US Dollar thousand											
'0202	Meat of bovine animals, frozen.	2,438	2,335	6,536	6,567	5,591	3,898	2,054	1,099	2,660	1,948
'0204	Meat of sheep or goats, fresh, chilled or frozen.	3,008	3,298	1,304	1,509	4,717	5,330	5,123	3,916	4,093	1,683
'0207	Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen.	43	1				8	154	337	701	155
'0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen.		104		46	56	20	1	33	129	20
'0203	Meat of swine, fresh, chilled or frozen.	1	22,267	837	29	38	1			2	4
'0201	Meat of bovine animals, fresh or chilled	11,875	5,176	14		1		637	104		1
'0209	Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked.		1,803		26						
Exported quantity, Tons											
'0202	Meat of bovine animals, frozen.	636	649	2,344	2,615	1,918	1,342	724	380	832	419
'0204	Meat of sheep or goats, fresh, chilled or frozen.	754	876	458	576	1,655	1,716	1,567	1,200	1,043	378
'0207	Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen.	20					20	260	364	549	95
'0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen.		59		94	38	12	2	59	128	35

(continue)

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
'0201	Meat of bovine animals, fresh or chilled.	3,057	1,321	6				268	42		
'0203	Meat of swine, fresh, chilled or frozen.		5,123	389	25	18					
'0209	Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked.		806		42						

Source: ITC Trade Map

The situation with the export of "Meat of sheep or goats, fresh, chilled, or frozen" follows a similar pattern of increased dependence on the Russian market.

In 2020-2021, the significant decline in exports to Russia, dropping from approximately 1,000 tons in 2017-2019 to 497 tons in 2020 and further to 152 tons in 2021, was partially offset by the identification of new markets such as Bahrain, Jordan, Oman, Egypt, Iraq, Qatar, and the United Arab Emirates.

In 2021, for the first time in the last 10 years, Russia was surpassed by three countries in terms of exports. As a result, the top three export markets became Bahrain, Jordan, and Oman. Approximately 200 tons of meat were delivered to each of these markets. Unfortunately, in 2022, Moldova was unable to maintain its positions in the markets of the Arab world, leading to a dramatic decline in exports to 378 tons, with a total value of 1,683 thousand USD.

Under these circumstances, Russia regained its position as the primary sales market in 2022, accounting for approximately 60% of exports in both value and volume terms.

Over the past 10 years, frozen sheep carcasses and half-carcasses (excluding lambs) have consistently been the primary exported product within the Meat of Sheep or Goats category, accounting for a share ranging between 75% and 90% of the total exported volume.

Over the past five years, Moldova has also been exporting frozen fowls (mainly) and frozen cuts and edible offal of fowls of the species Gallus domesticus. Azerbaijan serves as the primary market for this product category. However, the market has demonstrated significant volatility. In 2022, exports to Azerbaijan experienced a sharp decline, dropping from 505 tons to 60 tons.

Imports

From the Meat and Edible Meat Offal category, Moldova imports the most Meat and edible offal, of the poultry of heading 01.05, fresh, chilled, or frozen. In the last 10 years, the imported volume and value increased by 22% and 31%, respectively.

Ukraine is by far the main supplier, with 60% of the total volume imported in 2022 and 66% of the value of imports. Other important import markets are Poland and Hungary, with approximately 18% and 10% respectively of the imported volume in 2022. Moldova also imports in smaller quantities from Belgium, Romania, Brazil and France.

Table 12. Moldova imports of meat and edible meat offal, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Imported value, US Dollar thousand											
'0207	Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen.	24,127	23,590	14,898	13,136	15,586	16,852	23,260	22,425	30,317	31,614
'0203	Meat of swine, fresh, chilled or frozen.	15,191	24,482	8,670	7,512	15,280	15,482	14,462	9,959	21,022	28,740
'0202	Meat of bovine animals, frozen.	1,687	1,563	864	402	358	564	503	1,008	2,585	4,253
'0209	Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked.	1,902	2,287	816	974	1,371	1,507	1,777	1,721	2,154	2,683
'0210	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal.	244	279	286	440	528	730	840	614	1,038	1,447
'0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen.	2,117	1,439	503	469	547	725	639	578	1,168	1,401
'0201	Meat of bovine animals, fresh or chilled.	201	522	49	221	102	74	89	261	456	1,154
Imported quantity, Tons											
'0207	Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen.	18,448	18,769	17,165	16,719	15,853	17,947	22,482	23,142	24,880	22,537
'0203	Meat of swine, fresh, chilled or frozen	5,803	9,377	4,177	3,113	5,829	6,274	4,916	3,448	8,374	11,681
'0209	Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked.	1,554	2,337	1,028	1,068	1,305	1,517	1,237	1,084	1,509	1,594
'0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen.	1,835	1,493	754	557	492	577	415	358	746	969
'0202	Meat of bovine animals, frozen.	425	448	250	177	139	195	168	286	601	877
'0201	Meat of bovine animals, fresh or chilled.	58	153	2	97	30	8	19	16	24	170
'0210	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal.	24	20	32	42	49	68	75	47	80	132

Source: ITC Trade Map

Meat of swine, whether fresh, chilled, or frozen, represents a significant import category for Moldova. In 2022, the country imported a substantial quantity of 11,681 tons of swine meat, amounting to a total value of 28,740 thousand USD.

The main suppliers of swine meat to Moldova in 2022 were Poland (26% of the volume), Spain (22%), Germany (21%) and Hungary (11%) were the main suppliers in 2022.

Additionally, Moldova sourced swine meat from several other countries, including Belgium, the Netherlands, Slovakia, France, Denmark, and Austria.

The import of swine meat is dominated by Frozen meat of swine (excl. carcasses and half-carcases, and hams, shoulders, and cuts thereof, with 70% of the total volume.

In 2022, Moldova imported a total of 877 tons of frozen meat from bovine animals, with a total value of 4,253 thousand USD. Most of these imports, approximately 89%, consisted of boneless meat from bovine animals.

Ukraine emerged as the primary import market, accounting for 72% of the total imported volume and 74% of the total import value. Lithuania stood as the second-largest supplier, contributing roughly 18% of both the imported volume and value.

In 2022, Moldova imported several other categories of meat-related products:

- Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked. These products were imported with a total value of 2.683 thousand USD and a weight of 1.594 tons. The primary suppliers for these products were Germany, Poland, and Spain.
- Meat and edible meat offal, salted, in brine, dried or smoked, edible flours and meals of meat or meat. This category had a total import value of 1.447 thousand USD, with a weight of 132 tons. The main suppliers for these products were Italy and Spain.
- Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules, or hinnies, fresh, chilled or frozen. The total import value for this category was 1,401 thousand USD, with a weight of 969 tons. Germany and Poland were the main suppliers of these products.
- Meat of bovine animals, fresh or chilled: This category had a total import value of 1,154 thousand USD, with a weight of 170 tons. Romania was the primary supplier of this meat.

Trade Balance

The trade balance for meat of sheep or goats, whether fresh, chilled, or frozen, has consistently been positive in Moldova over the last 10 years. This indicates that Moldova is exporting more of these products than it is importing, which can be a positive sign for the country's meat industry.

On the other hand, for the product "Meat of bovine animals, frozen," Moldova had a solid positive trade balance in the period from 2013 to 2019. However, this trade balance significantly decreased in 2020 and 2021, ultimately turning negative in 2022. The shift to a negative trade balance was primarily due to increased imports from Ukraine, with the volume of imports growing more than fivefold in 2022 compared to 2019.

Table 13. Moldova trade balance for meat and edible meat offal, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance in value, US Dollar thousand											
'0204	Meat of sheep or goats, fresh, chilled or frozen.	2,977	3,218	1,256	1,499	4,700	5,302	5,037	3,883	4,051	1,548
'0201	Meat of bovine animals, fresh or chilled.	11,674	4,654	-35	-221	-101	-74	548	-157	-456	-1,153
'0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen.	-2,117	-1,335	-503	-423	-491	-705	-638	-545	-1,039	-1,381
'0210	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal.	-244	-279	-286	-440	-528	-730	-840	-614	-1,038	-1,447
'0202	Meat of bovine animals, frozen.	751	772	5,672	6,165	5,233	3,334	1,551	91	75	-2,305
'0209	Pig fat, free of lean meat, and poultry fat, not rendered or otherwise extracted, fresh, chilled, frozen, salted, in brine, dried or smoked.	-1,902	-484	-816	-948	-1,371	-1,507	-1,777	-1,721	-2,154	-2,683
'0203	Meat of swine, fresh, chilled or frozen.	-15,190	-2,215	-7,833	-7,483	-15,242	-15,481	-14,462	-9,959	-21,020	-28,736
'0207	Meat and edible offal, of the poultry of heading 01.05, fresh, chilled or frozen.	-24,084	-23,589	-14,898	-13,136	-15,586	-16,844	-23,106	-22,088	-29,616	-31,459

Source: ITC Trade Map

3.3.3 Dairy produce; birds' eggs; edible products of animal origin, not elsewhere specified or included (HS 04)

Exports

Cheese and curd is the main position exported by Moldova from this product category. In 2022, the value of Moldova's exports was 5,429 thousand USD, and the volume was 1,191 tons.

The major export destinations for Moldovan cheese and curd are Russia (56%) and Kazakhstan (43%), together accounting for about 99% of the export volume.

Table 14. Moldova exports of dairy produce; birds' eggs; edible products of animal origin, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exported value, US Dollar thousand											
'0406	Cheese and curd	4,897	5,367	4,029	3,424	4,642	5,381	5,447	7,243	7,048	5,429
'0407	Birds' eggs, in shell, fresh, preserved or cooked	375	299	2,071	1,993	3,706	2,933	1,569	930	557	582
'0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	126	824	621	2,571	3,638	3,337	387	393	148	494
'0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy ...	2,292	1,641	1,868	4,690	2,245	221	0	48	1	26
Exported quantity, Tons											
'0406	Cheese and curd	773	877	1,050	999	1,246	1,426	1,349	1,565	1,597	1,191
'0407	Birds' eggs, in shell, fresh, preserved or cooked	323	252	2,405	2,422	4,442	3,306	1,615	945	482	420
'0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	40	243	291	1,185	1,362	1,123	209	120	60	147
'0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy ...	475	401	747	1,597	542	50		14	0	4

Source: ITC Trade Map

The export of Cheese and curd includes 2 products, namely:

- **Cheese** (excl. fresh cheese, incl. whey cheese, curd, processed cheese, blue-veined cheese, and other cheese containing veins produced by "Penicillium roqueforti", and grated or powdered cheese).

  Until 2021, this product category constituted approximately 96-98% of the total volume of Cheese and curd exported, with the majority directed toward the Russian market. However, in 2022, the volume of exports experienced a significant decline, dropping by 2.4 times (from 1,510 tons to 631 tons).

- **Processed cheese not grated or powdered.**

  In 2022, there was a remarkable increase in the export of this product, surging from 87 tons in 2021 to 560 tons in 2022. This category represented around 37% of the total volume of Cheese and curd exported. The primary market for processed cheese was Kazakhstan, accounting for 75% of the exported volume.

  In 2022, the export of processed cheese from Moldova experienced a significant increase, rising from 87 tons in 2021 to 560 tons in 2022. This product category constituted approximately 37% of

the total volume of Cheese and curd exported by Moldova. Kazakhstan emerged as the primary market for processed cheese, absorbing 75% of the total exported volume.

With Moldova's market access to Iraq in 2015, the exports of products falling under the category of **Birds' eggs, in shell, fresh, preserved, or cooked** experienced rapid growth, peaking in 2017 at USD 3,706 thousand, with a volume of 4,442 tons. In 2017, Moldova's exports to Iraq primarily consisted of:

- Birds' eggs, in shell, preserved or cooked (2,915 tons) and
- Fresh birds' eggs, in shell (excluding domestic fowls and fertilized eggs for incubation) (1,526 tons).

In 2020, Moldova lost its sales market in Iraq, and unfortunately, this loss could not be offset by establishing and maintaining a strong presence in other new markets.

In 2022, Moldova exported 420 tons of eggs, valued at 582 thousand USD. Liberia was the primary export partner, accounting for 81% of the total export value. Liberia has been the only market to which Moldova has consistently exported eggs over the past five years. Additionally, there were small exports to the markets of Gambia and Djibouti.

Fresh eggs of domestic fowls, in shell (excluding fertilized eggs for incubation), make up most Moldova's exports in this product category, accounting for approximately 90% of the total exports.

In the period from 2016 to 2018, Moldova exported more than 1,000 tons of **Milk and cream, concentrated, or containing added sugar or other sweetening matter** (specifically **'Milk and cream in solid forms, of a fat content by weight of <= 1.5%**), primarily to the markets of Kazakhstan and Russia.

Certainly, the loss of Kazakhstan and Russia markets had a substantial impact on Moldova's overall exports, as demand in the newly identified markets was limited and somewhat volatile. In 2022, Moldova exported 147 tons of this product to Georgia, amounting to a value of USD 493 thousand.

Imports

Moldova's strong dependence on imports of dairy products, bird's eggs, and edible products of animal origin is evident.

In 2022, the country imported Cheese and curd with a total value of USD 38,042 thousand, accounting for 7,322 tons. Most of these imports, roughly two-thirds, originated from Poland, Ukraine, and Germany. Moldova's import market for Cheese and curd is diverse, with countries like Italy, Latvia, Belarus, Romania, Netherlands, France, Denmark, and Bulgaria among the suppliers.

Moldova's imports of Milk and cream, not concentrated nor containing added sugar or other sweetening matter, are primarily sourced from four countries: Ukraine, Poland, Romania, and Belarus. In 2021, around 80% of the imported volume came from Ukraine and Romania. However, in 2022, the volume of imports from Ukraine surged by approximately 3.5 times, increasing from 7,577 tons to 26,139 tons. This significant increase could likely be attributed to the war in the neighbouring country (Ukraine) and the resulting challenges in local processing. Over the last five years, approximately 80-85% of Moldova's imported volume of Butter, including dehydrated butter and ghee, as well as other fats and oils derived from milk, are sourced from Ukraine. Moldova also imports smaller volumes of these products from other countries, including Romania, Belarus, France, Poland, Netherlands, and Denmark.

Imports of buttermilk, curdled milk and cream, yogurt, kefir, and other fermented or acidified milk and cream, whether or not concentrated or containing added sugar or other sweetening matter or flavoured or containing added fruit, nuts, or cocoa have doubled over the last 10 years, reaching a volume of 9,079 tons in 2022. Romania was the primary supplier, accounting for 44% of the total volume imported, followed by Ukraine at 23%. Moldova also imported these products from other countries including Germany, the Russian Federation, Poland, Belgium, and Belarus.

In 2022, Moldova imported 3,139 tons of milk and cream, concentrated, or containing added sugar or other sweetening matter, with a total value of 10,106 thousand USD. Approximately 40% of the total volume came from Ukraine. Other significant suppliers for Moldova in this category included France, Belarus, Belgium, and Poland.

Table 15. Moldova imports of dairy produce; birds' eggs; edible products of animal origin, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Imported value, US Dollar thousand											
'0406	Cheese and curd	15,715	13,866	10,455	11,919	14,813	18,487	21,927	25,236	32,933	38,042
'0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	5,041	5,748	3,830	8,090	8,953	8,763	8,510	11,424	12,745	21,482
'0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy ...	3,187	1,816	1,334	2,274	6,737	8,811	10,881	11,623	18,337	17,195
'0403	Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and ...	8,183	7,439	6,223	6,508	7,662	9,302	11,309	12,830	15,090	16,506
'0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	9,015	8,498	4,563	4,519	4,709	3,790	5,150	8,552	6,135	10,106
'0407	Birds' eggs, in shell, fresh, preserved or cooked	4,144	3,461	5,271	4,023	5,019	5,121	6,053	5,335	5,649	6,295
'0404	Whey, whether or not concentrated or containing added sugar or other sweetening matter; products ...	893	708	489	353	547	609	508	581	754	847
'0408	Birds' eggs, not in shell, and egg yolks, fresh, dried, cooked by steaming or by boiling in ...	102	139	100	107	88	137	89	126	180	204
Imported quantity, Tons											
'0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	5,398	9,005	6,182	14,170	23,397	22,087	15,138	20,206	22,657	33,910
'0403	Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and ...	4,379	3,988	4,348	4,675	5,218	6,048	7,255	8,330	9,399	9,079
'0406	Cheese and curd	3,795	3,343	3,167	3,693	3,900	4,621	5,374	6,046	7,527	7,322
'0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	2,947	2,861	2,598	2,879	2,250	2,036	2,296	3,634	2,372	3,139
'0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy ...	709	418	420	661	1,626	2,091	2,449	2,737	3,804	3,095
'0407	Birds' eggs, in shell, fresh, preserved or cooked	880	720	1,351	1,064	1,833	1,557	1,927	1,713	1,666	1,848
'0404	Whey, whether or not concentrated or containing added sugar or other sweetening matter; products ...	434	514	530	406	784	1,430	684	668	560	667
'0408	Birds' eggs, not in shell, and egg yolks, fresh, dried, cooked by steaming or by boiling in ...	21	29	23	25	23	32	27	36	40	42

Source: ITC Trade Map

Trade Balance

Moldova experiences a negative trade balance for all products within the category of dairy produce, birds' eggs, and edible products of animal origin. This indicates that Moldova imports more of these products than it exports, resulting in a trade deficit in this category.

Table 16. Moldova trade balance for dairy produce; birds' eggs; edible products of animal origin, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance in value, US Dollar thousand											
'0406	Cheese and curd	-10,818	-8,499	-6,426	-8,495	-10,171	-13,106	-16,480	-17,993	-25,885	-32,613
'0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	-5,041	-5,716	-3,830	-8,090	-8,953	-8,763	-8,510	-11,418	-12,745	-21,480
'0405	Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy ...	-895	-175	534	2,416	-4,492	-8,590	-10,881	-11,575	-18,336	-17,169
'0403	Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and ...	-8,183	-7,407	-6,223	-6,508	-7,662	-9,301	-11,308	-12,830	-15,085	-16,506
'0402	Milk and cream, concentrated or containing added sugar or other sweetening matter	-8,889	-7,674	-3,942	-1,948	-1,071	-453	-4,763	-8,159	-5,987	-9,612
'0407	Birds' eggs, in shell, fresh, preserved or cooked	-3,769	-3,162	-3,200	-2,030	-1,313	-2,188	-4,484	-4,405	-5,092	-5,713
'0404	Whey, whether or not concentrated or containing added sugar or other sweetening matter; products ...	-893	-708	-489	-353	-547	-609	-508	-581	-754	-847
'0408	Birds' eggs, not in shell, and egg yolks, fresh, dried, cooked by steaming or by boiling in ...	-102	-139	-100	-107	-88	-137	-89	-126	-167	-204

Source: ITC Trade Map

3.3.4 Preparations of meat (HS 16)

Exports

It's unusual for Moldova that the export of prepared or preserved meat reached 250 tons with a total value of 906 thousand USD. This export was primarily directed towards the neighbouring country, Ukraine, and it is highly probable that this shift in trade was strongly influenced by the ongoing war situation.

Table 17. Moldova exports of preparations of meat, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exported value, US Dollar thousand											
'1602	Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, ...	5	194				1				906
'1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	1	1			1	1			1	4
Exported quantity, Tons											
'1602	Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, ...	2	23				0				250
'1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	0	0			0	0			0	0

Source: ITC Trade Map

Imports

In 2022, Moldova recorded a historic high in the import of prepared or preserved meat, amounting to approximately 3,180 tons, with a total value of 7,803 thousand USD.

The largest import markets for Moldova in this category are Romania and Poland, together accounting for 75% of the import volume and 60% of their total value. Additionally, other significant import markets include Hungary, Belarus, Ukraine, Italy, Germany, Spain, and Latvia.

The import market for sausages and similar products is predominantly led by Italy and Spain, jointly accounting for 56% of the import volume and a substantial 74% of their total value.

Romania, Hungary, and Ukraine together represent approximately 37% of the deliveries and around 20% of the import volume in 2022.

Table 18. Moldova imports of preparations of meat, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exported value, US Dollar thousand											
'1602	Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, ...	3,873	3,521	2,752	2,807	4,020	5,046	5,198	5,533	6,015	7,803
'1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	834	773	542	459	638	561	889	1,113	1,979	2,419
Exported quantity, Tons											
'1602	Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, ...	2,095	2,173	2,036	2,155	3,016	3,005	2,919	2,959	2,771	3,180
'1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	443	304	165	69	85	64	99	118	263	336

Source: ITC Trade Map

Trade Balance

Moldova is a net importer of preparations of meat, indicating that it imports more of these products than it exports in this category.

Table 19. Moldova trade balance for preparations of meat, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance in value, US Dollar thousand											
‘1602	Prepared or preserved meat, meat offal, blood or insects (excl. sausages and similar products, ...	-3,868	-3,327	-2,752	-2,807	-4,020	-5,045	-5,198	-5,533	-6,015	-6,897
‘1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	-833	-772	-542	-459	-637	-560	-889	-1,113	-1,978	-2,415
‘1603	Extracts and juices of meat, fish or crustaceans, mollusks and other aquatic invertebrates	0	0	-1	-4	-1	-3	-6	-9	-3	-6

Source: ITC Trade Map

3.3.5 Ice cream and other edible ice, whether or not containing cocoa (HS 2105)

Exports

The value of ice cream exports from Moldova has achieved a historic high over the past decade, amounting to approximately 9,949 thousand USD and totalling 3,640 tons.

Within just two years, Saudi Arabia has emerged as the largest importer of Moldovan ice cream, accounting for 1,433 tons and a total value of 4,318 thousand USD, which makes up 43% of the total export.

Iraq, which held the position of being the number one export market from 2013 to 2019, slipped to become the second-largest export market in 2022. Over the past few years, Moldova’s exports to Iraq have notably decreased by approximately 3.5 times. In 2022, the export volume to Iraq reached approximately 665 tons, with a total value of 1,570 thousand USD.

Indeed, Moldova has several other main ice cream export markets, including various African countries such as Mali, Ghana, Burkina Faso, Côte d’Ivoire, Togo, and Senegal. Additionally, the United Arab Emirates and Turkey are important destinations for Moldovan ice cream.

It’s noteworthy that in 2022, the Moldovan company Sandriliona achieved a significant milestone by exporting ice cream to Romania, an EU member country. While the initial exports might have been relatively small in scale, this first export marks a clear indicator that with continued efforts, access to the EU market can be achieved and expanded upon.

Table 20. Moldova exports of ice cream and other edible ice, whether or not containing cocoa, 2013-2022

Importers, US Dollar thousand	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
World	**7,319**	**6,159**	**5,763**	**5,897**	**6,145**	**8,084**	**6,985**	**3,325**	**4,542**	**9,949**
Saudi Arabia	0	0	0	0	0	0	1	0	1,357	4,318
Iraq	5,782	4,915	4,577	4,748	4,629	5,335	4,944	1,507		1,570
Mali	0	0	0	0	23	371	428	553	721	782
Ghana	916	600	334	418	531	821	888	415	936	745
Ukraine	0	0	0	0	37	94	0	32	349	642
United Arab Emirates	0	0	0	0	116	85	106	168	203	520
Türkiye	0	0	0	0	0	0	0	0	46	456
Burkina Faso	0	0	0	0	0	0	64	306	440	438
Côte d'Ivoire	272	360	492	455	512	682	0	0		178
Togo	0	0	0	0	0	0	0	0	95	145
Senegal	269	234	300	268	236	498	442	319	363	142
Area Nes	15	11	8	7	8	17	20	2	6	9
Romania	0	6	0	0	0	0	0	0		3
Importers, quantity, Tons	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
World	**3,772**	**2,817**	**2,850**	**3,022**	**2,945**	**3,576**	**3,250**	**1,490**	**1,908**	**3,640**
Saudi Arabia							0		577	1,433
Iraq	3,014	2,189	2,247	2,427	2,240	2,343	2,355	711		665
Mali					11	155	200	247	311	356
Ghana	434	283	151	194	244	342	373	179	380	266
Ukraine					22	75		15	167	243
Burkina Faso							30	129	199	202
United Arab Emirates					29	24	33	50	58	155
Türkiye									16	105
Côte d'Ivoire	139	186	259	237	245	326				79
Togo									40	69
Senegal	159	140	181	161	127	233	211	147	146	62
Area Nes	5	4	4	4	4	3	4	1	2	3
Romania		4								1

Source: ITC Trade Map

Imports

In 2022, Moldova imported approximately 1,555 tons of ice cream, with a total value of 5,050 thousand USD. Ukraine stands out as the largest import market for ice cream, accounting for a significant share of 67% by volume and 58% by value. Romania and Germany together contribute to approximately 18% of import (volume and value). Moldova's import markets for ice cream are diversified, including countries such as Hungary, France, Poland, Italy, Belgium, Belarus, Bulgaria, Lithuania, the Czech Republic, and the Netherlands.

Table 21. Moldova imports of ice cream and other edible ice, whether or not containing cocoa, 2013-2022

Exporters, US Dollar thousand	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
World	**2,097**	**1,802**	**2,089**	**1,610**	**2,167**	**2,858**	**3,168**	**3,487**	**3,823**	**5,050**
Ukraine	1,258	1,220	1,474	1,057	1,427	1,933	2,041	2,058	2,178	2,952
Romania	134	170	246	309	521	415	428	517	467	607
Germany	1	13	16	15	13	63	152	201	245	331
Hungary	0	18	0	38	16	175	201	175	259	275
France	0	5	3	10	5	36	164	223	187	216
Poland	0	8	1	141	139	116	19	41	65	113
Italy	0	4	0	17	5	30	55	83	113	109
Belgium	0	0	0	0	0	0	10	91	111	99
Belarus	282	183	188	0	0	0	0	16	79	99
Bulgaria	0	0	0	0	7	17	8	4	1	89
Lithuania	0	0	0	0	0	3	24	24	36	45
Czech Republic	0	0	0	0	0	22	22	23	31	42
Netherlands	0	0	0	0	0	0	26	14	37	41
Exporters, quantity, Tons	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
World	**780**	**639**	**1,013**	**710**	**903**	**1,112**	**1,097**	**1,140**	**1,185**	**1,555**
Ukraine	569	498	809	554	718	910	883	818	829	1,045
Romania	37	43	72	84	127	94	95	141	122	169
Germany	0	2	3	10	2	11	33	66	77	111
Hungary		3		7	3	35	37	29	42	49
France		1	0	2	1	7	18	25	22	33
Belgium							3	25	29	29
Belarus	96	52	65					5	24	27
Bulgaria					1	6	2	1	0	20
Poland		2	0	45	38	31	5	9	11	20
Netherlands							3	1	4	14
Italy		1		2	1	4	7	10	12	12

Source: ITC Trade Map

Trade Balance

Ice cream is indeed one of the few animal-origin products with a positive trade balance. In 9 out of the last 10 years, it amounted to approximately 4-5 million USD.

Table 22. Moldova trade balance for ice cream and other edible ice, whether or not containing cocoa, 2013-2022

Code	Product label	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance in value, US Dollar thousand											
'210500	Ice cream and other edible ice, whether or not containing cocoa	**5,222**	**4,357**	**3,674**	**4,287**	**3,978**	**5,226**	**3,817**	**-162**	**719**	**4,899**

Source: ITC Trade Map

3.4 General overview of the sector. Competitiveness assessment

3.4.1 Animal production (livestock farms)

Number of enterprises

According to NBS data, **346 enterprises were engaged in animal breeding as their main type of activity at the end of 2022,** compared to 255 at the end of 2014. The share of active enterprises constituted 73% (those with a turnover greater than zero).

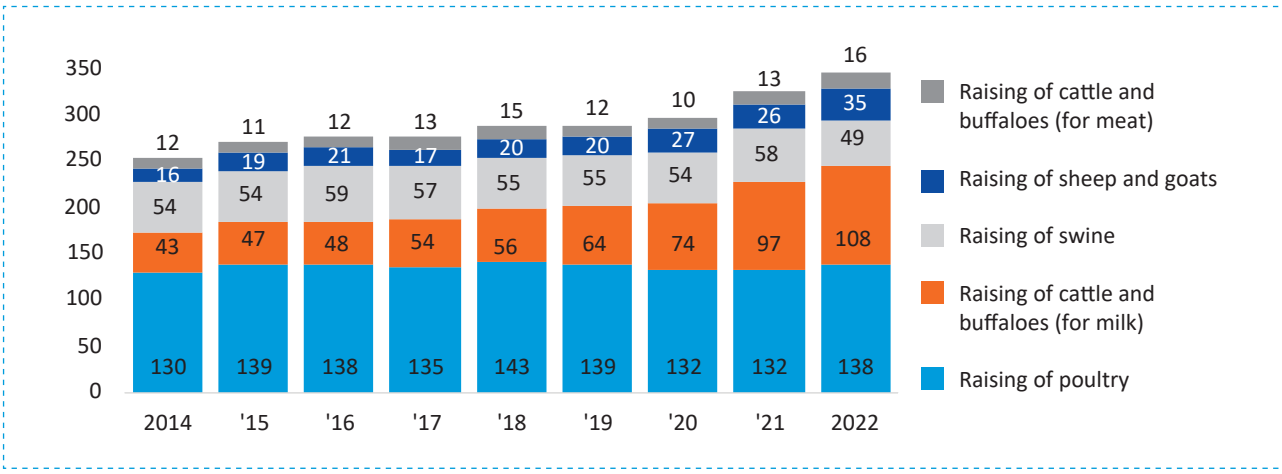
Most companies were involved in poultry breeding, with 138 of them, showing a marginal increase compared to 2014 when there were 130 enterprises.

The number of farms raising dairy cattle saw the most rapid growth from 43 in 2014 to 108 in 2022.

Pig breeding is the only activity that witnessed a decrease in the number of enterprises, dropping from 54 in 2014 to 49 in 2022.

In 2022, only 16 companies were engaged in raising beef cattle, compared to 12 in 2014, while 35 enterprises were active in the field of raising sheep and goats, up from 16 in 2014.

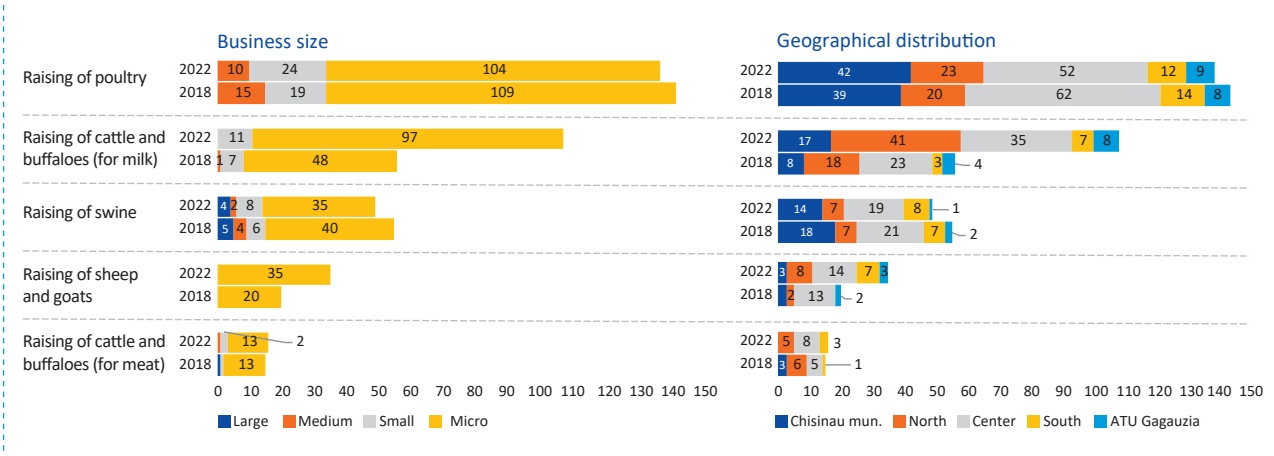
Figure 33. Numbers of enterprises (animal production)



Source: NBS

The sector is dominated by micro-businesses. There are only four large enterprises, and all of them are pig farms.

Figure 34. Numbers of enterprises by business size and geographical distribution (animal production)



Source: NBS

At the end of 2022, there were only 13 medium-scale farms in operation. Out of these, 10 were poultry farms, 2 were focused on raising pigs, and 1 specialized in raising beef cattle.

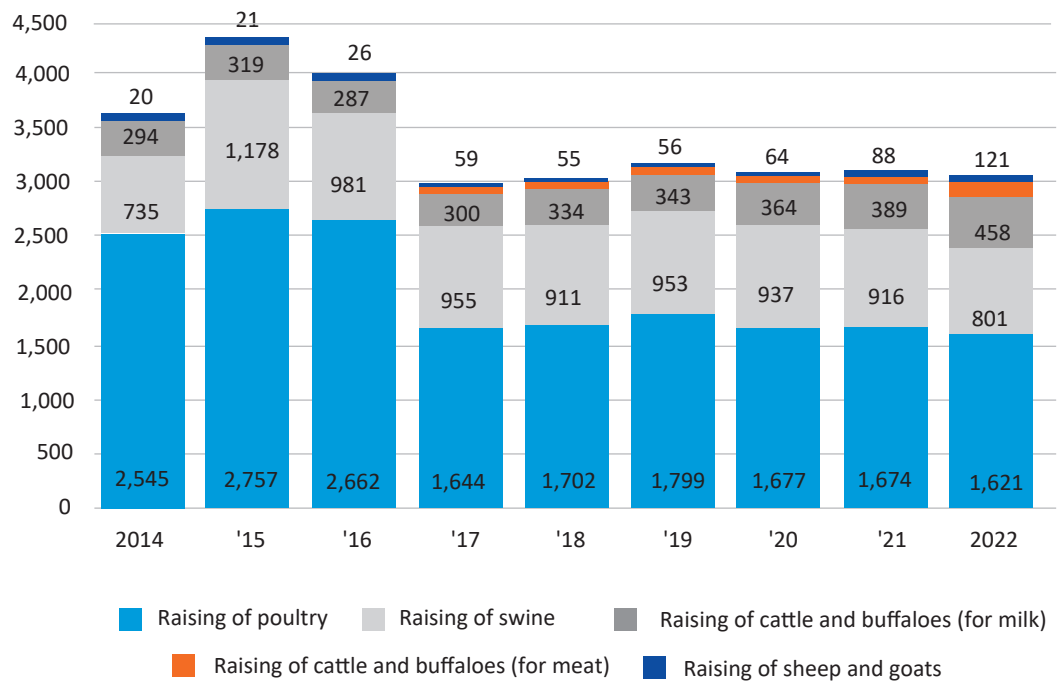
Most livestock farms are situated in the central region of Moldova. The sole exception is the dairy cattle sector, where most farms are in the northern part of Moldova.

Number of employees

The number of employees who worked in the animal breeding sector was 3,067 at the end of 2022, 15.4% less compared to 2014.

Most employees were engaged in farms specializing in poultry breeding (1,621 employees), pig breeding (801), and dairy cattle breeding (458). In contrast, beef cattle breeding (121) and sheep and goat breeding (66) had the fewest employees.

Figure 35. Numbers of employees (animal production)



Source: NBS

In 2022, the average number of employees per farm category was as follows:

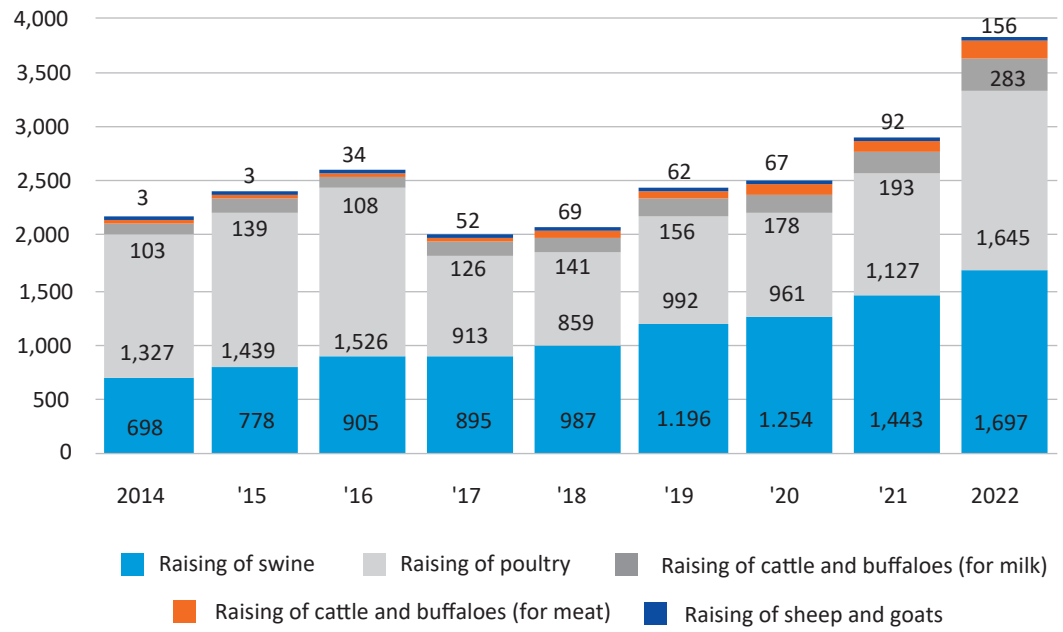
- Pig farming: 16.3 employees (13.6 in 2014).
- Poultry farming: 11.7 employees (19.6 in 2014).
- Breeding cattle for meat: 7.6 employees (1.7 in 2014).
- Breeding of dairy cattle: 4.2 employees (6.8 in 2014).
- Breeding of sheep and goats: 1.9 employees (1.9 in 2014).

Turnover

In 2022, the cumulative turnover of livestock and poultry farms amounted to approximately 3,801 thousand MDL, which is 78% higher than the figure reported in 2014 (2,135 thousand MDL in 2014). It's important to note the inflationary nature of these numbers.

The activities of pig farming and poultry farming were the primary contributors to the turnover, accounting for 45% and 43% respectively in 2022.

Figure 36. Total turnover (animal production)



Source: NBS

In 2022, the average turnover per employee by category of animal breeding farms, in descending order, was as follows:

- Raising pigs: 2,119 thousand lei (950 thousand lei in 2014).
- Raising cattle for meat: 1,292 thousand lei (139 thousand lei in 2014).
- Poultry breeding: 1,015 thousand lei (521 thousand lei in 2014).
- Breeding of dairy cattle: 617 thousand lei (351 thousand lei in 2014).
- Breeding of sheep and goats: 298 thousand lei (132 thousand lei in 2014).

3.4.2 Production, processing and preserving of meat and meat products

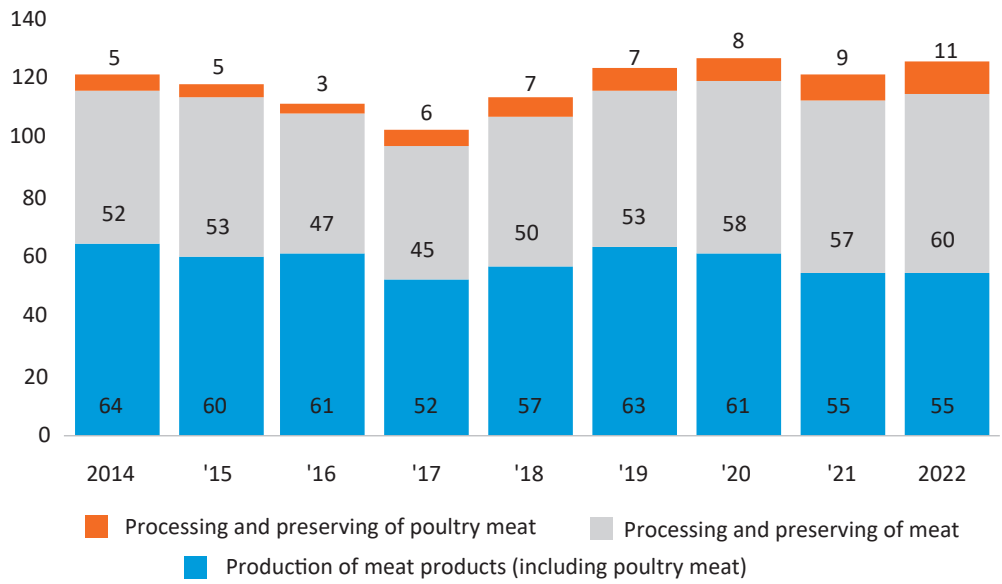
Number of enterprises

According to NBS data, **126 companies operated in the field of meat production, processing, and preservation in 2022**, compared to 121 in 2014.

The majority of companies were involved in the production, processing, and preservation of meat (60), followed by the manufacture of meat products (including poultry) (55). Additionally, 11 enterprises specialized in the processing and preservation of poultry meat.

Approximately 71% of these companies were active in 2022, meaning they had a turnover greater than zero.

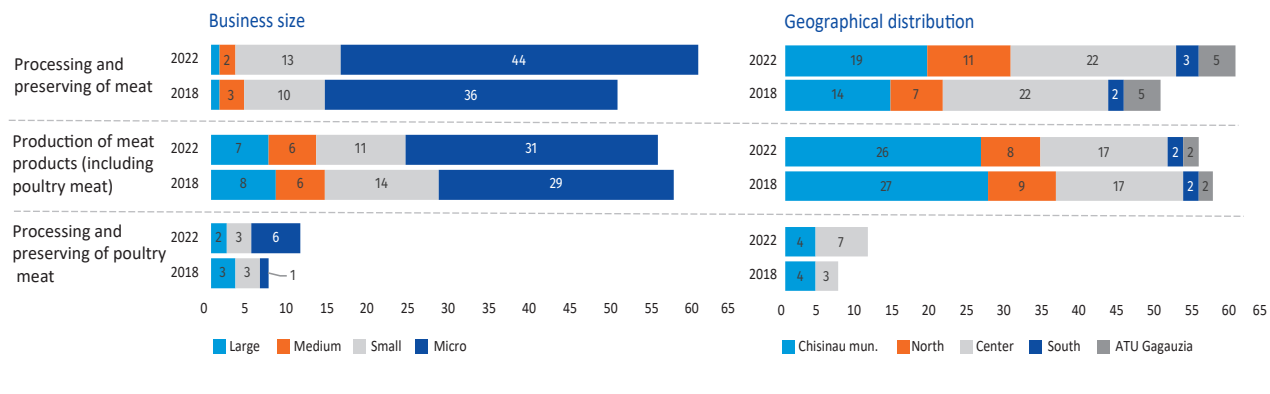
Figure 37. Numbers of enterprises (Production, processing and preserving of meat and meat products)



Source: NBS

Seven large enterprises primarily operate in the manufacturing of meat products, including poultry. The central region and the municipality of Chisinau host the majority of businesses in this sector.

Figure 38. Numbers of enterprises by business size and geographical distribution (Processing and preserving of meat animal production)



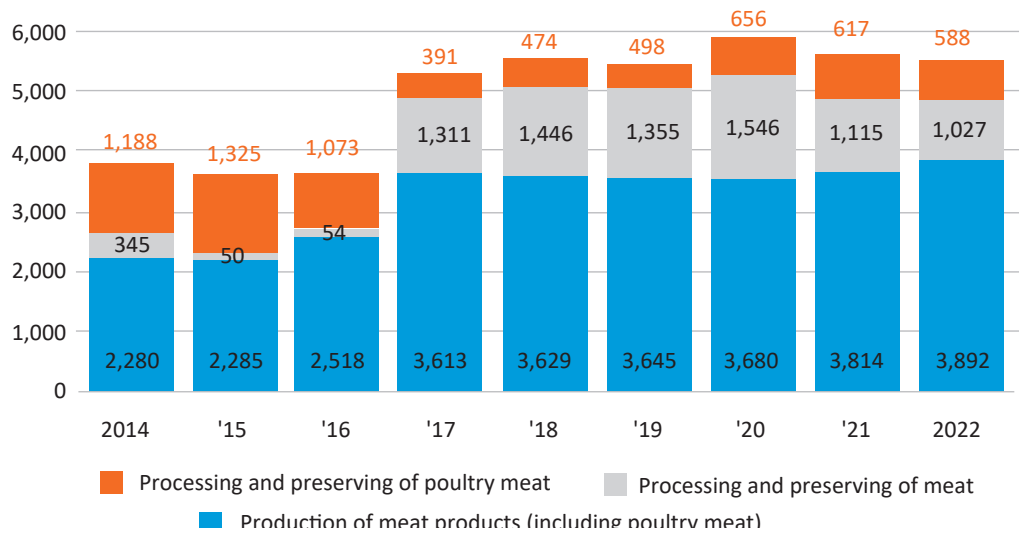
Source: NBS

Number of employees

At the end of 2022, the number of employees engaged in the production, processing, and preservation of meat and meat products was 5,507, representing a 44.2% increase compared to 2014.

The majority of employees, approximately 3,892, were employed in the manufacture of meat products, including poultry meat. About 1,000 employees were involved in the processing and preservation of poultry meat, and 600 in the production, processing, and preservation of meat (compared to 1,200 in 2014).

Figure 39. Numbers of employees (Processing and preserving of meat animal production)



Source: NBS

The average number of employees by enterprise category in 2022 was as follows:

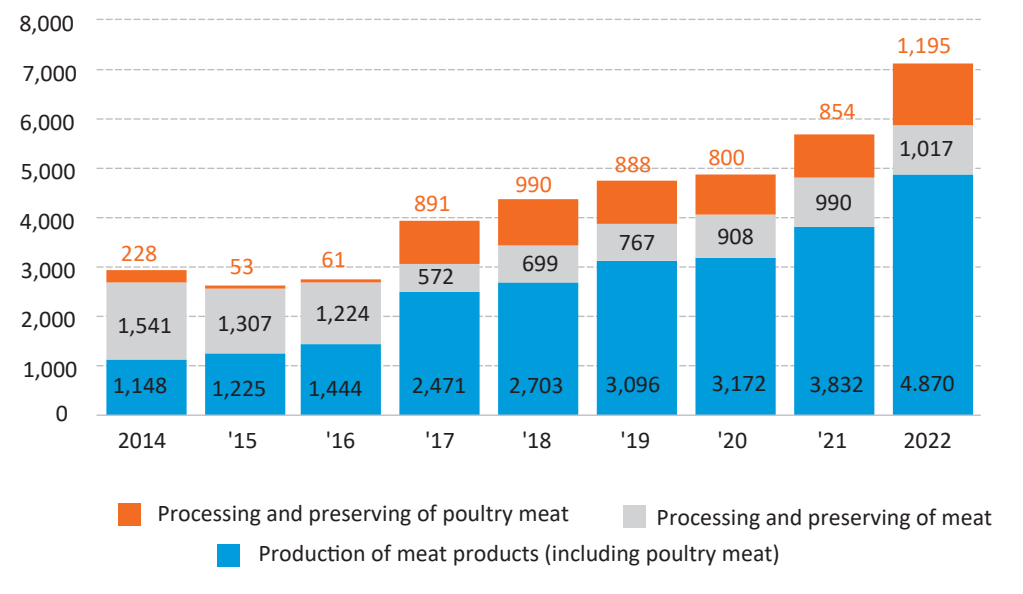
- Poultry processing and preservation: 93.4 employees (69.0 in 2014).
- Manufacture of meat products (including poultry): 70.8 employees (35.6 in 2014).
- Meat production, processing, and preservation: 9.8 employees (22.8 in 2014).

Turnover

In 2022, the cumulative turnover of enterprises involved in the production, processing, and preservation of meat and meat products amounted to 7,082 thousand MDL, which is nearly 1.5 times more compared to 2014 (2,916 thousand MDL).

The turnover in this sector has shown steady growth over the past decade, increasing by about 4.2 times compared to 2014.

Figure 40. Total turnover (Processing and preserving of meat animal production)



Source: NBS

In 2022, the average turnover per employee in the sector, in descending order, was as follows:

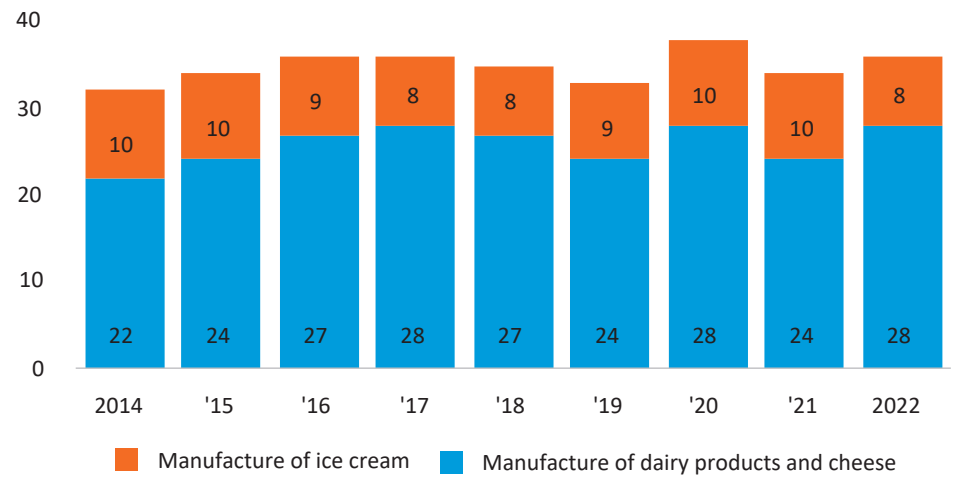
- Production, processing, and preservation of meat: 1,730 thousand lei (1,297 thousand lei in 2014).
- Manufacture of meat products (including poultry): 1,251 thousand lei (504 thousand lei in 2014).
- Poultry processing and preservation: 1,164 thousand lei (660 thousand lei in 2014).

3.4.3 Manufacture of dairy products

Number of enterprises

According to NBS data, 36 companies operated in the field of dairy products manufacturing in 2022, compared to 32 in 2014. Out of these, 28 were engaged in the production of dairy products and cheeses, while 8 focused on the manufacturing of ice cream. However, only 24 of these (or 67%) were active in 2022, reporting sales revenue greater than zero.

Figure 41. Numbers of enterprises (Manufacture of dairy products)

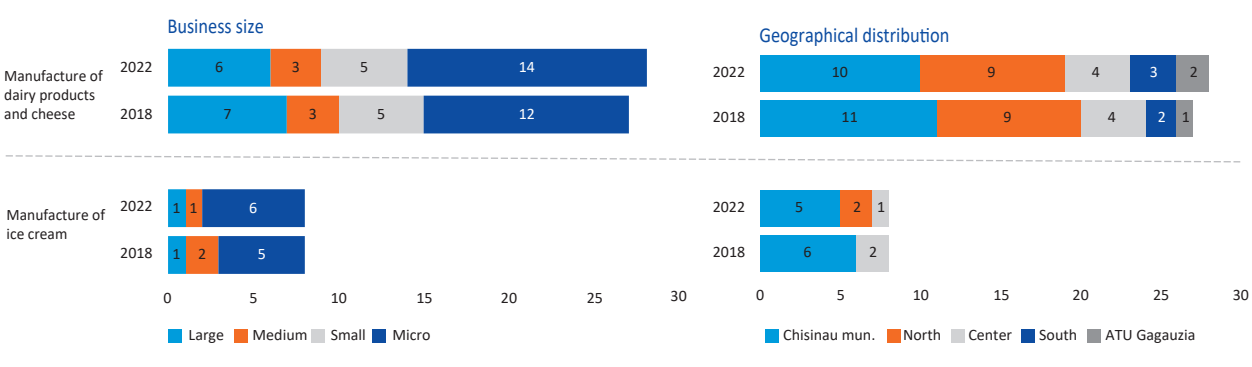


Source: NBS

There were 7 large enterprises active in the dairy products manufacturing sector, with 6 of them belonging to the dairy and cheese industry and 1 to the ice cream manufacturing sector.

The municipality of Chisinau and the northern part of the republic concentrated the largest number of enterprises in the sector.

Figure 42. Numbers of enterprises by business size and geographical distribution (Manufacture of dairy products)

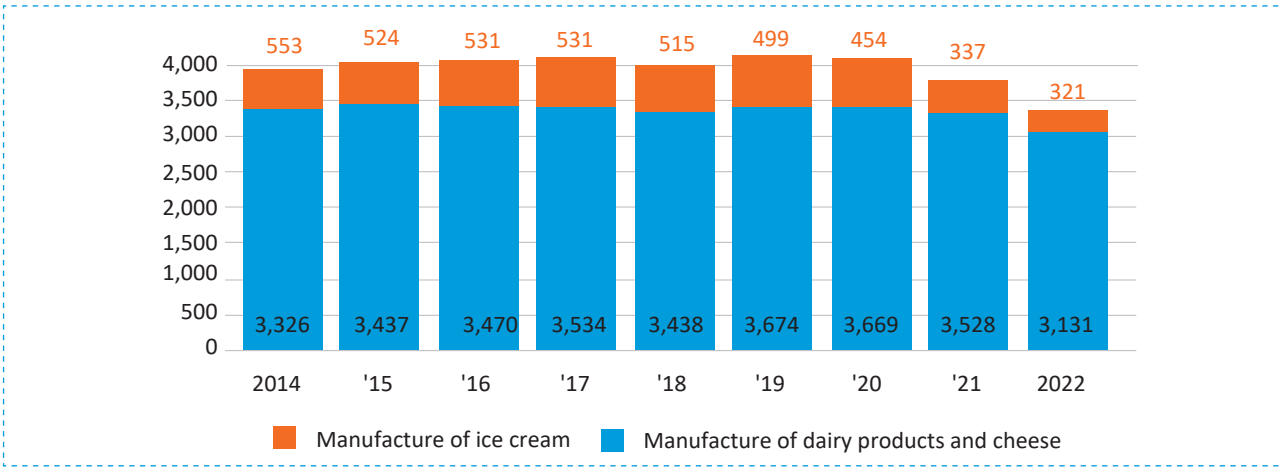


Source: NBS

Number of employees

At the end of 2022, approximately 3,500 employees were engaged in the manufacturing of dairy products, which is 11% fewer compared to 2014.

Figure 43. Numbers of employees (Manufacture of dairy products)



Source: NBS

The majority of employees, around 3,100, worked in the manufacturing of dairy products and cheeses, while approximately 320 employees were involved in the manufacture of ice cream.

The average number of employees by enterprise category in 2022 was as follows:

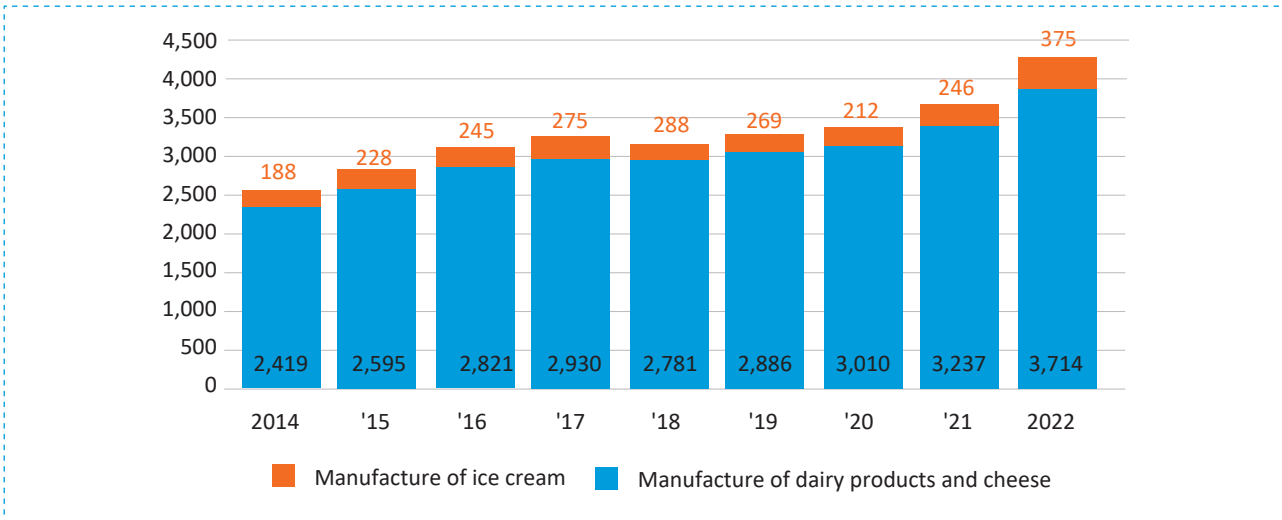
- Manufacture of dairy products and cheeses: 111.8 employees (151.2 in 2014).
- Ice cream manufacturing: 40.1 employees (55.3 in 2014).

Turnover

In 2022, enterprises in the dairy products manufacturing industry reported a cumulative turnover of 4,089 thousand MDL.

The companies in the dairy and cheese industry generated a turnover of 3,714 thousand MDL, while the turnover in the ice cream industry doubled compared to 2014, reaching 375 million MDL in 2022.

Figure 44. Total turnover (Manufacture of dairy products)



Source: NBS

In 2022, the average turnover per employee in the sector was as follows:

- Manufacture of dairy products and cheeses: 1,186 thousand lei (727 thousand lei in 2014).
- Ice cream manufacturing: 1,169 thousand lei (339 thousand lei in 2014, or 3.4 times more).

3.5 Business environment analysis (domestic regulations, trade & investment policies, tax, and customs policy, etc.)

Free Trade Agreements

The Republic of Moldova is an emerging market economy in the heart of Europe, bordered by Romania to the west and Ukraine to the north, east and south. Republic of Moldova is a member of the World Trade Organization since 2001, and benefits from free or preferential trade with 47 countries. Among trade associations and partnerships Moldova has subscribed to mind the most important ones:

- DCFTA (Deep and Comprehensive Free Trade Area with the European Union);
- FTA with CIS countries (Armenia, Azerbaijan, Tajikistan, Uzbekistan);
- FTA with Turkey;
- CEFTA;
- UNMIK (Kosovo);
- EFTA (Iceland, Liechtenstein, Norway, Switzerland);
- GUAM Organization for Democracy and Economic Development (Georgia, Ukraine, Azerbaijan and Moldova);
- SPTC - Strategic Partnership, Trade and Cooperation Agreement between The United Kingdom of Great Britain and Northern Ireland and The Republic of Moldova.

These economic-trade agreements allow Moldova resident companies to access markets that bring together more than 1 billion potential customers.

Policy and regulations

The development of the livestock sector, the consolidation of the food security and food safety are one of the principal goals of **the National Strategy of Agriculture and Rural Development (SNARD) for 2023-2030,** approved by the Government in February 2023 at a proposal by the MAFI.

The document includes objectives aimed at strengthening the agriculture sector, developing the food industry, and diversifying the markets, ensuring the transposition of the EU acquis and its progressive implementation. In the context of Moldova's aspirations to join the European Union, SNARD aligns with the Common Agricultural Policy – European model based on the principles of food sovereignty, sustainability, capacity of improving the productivity and enhancing the competitiveness of the agriculture sector including livestock sector and animal products.

The goal of the Strategy's enforcement is for the public investments in the agriculture sector to record constant increases up to more than 3 million lei till 2030. The strategy is to be implemented with the involvement of the national authorities, international partners, and business environment.

The **legislative framework in the zootechnical field** includes the following important laws:

- The animal husbandry law No 213/2022[45], which transposes into national legislation Regulation (EU) No 2016/1012;
- The Law No 231/2006[46], regarding the identification and registration of animals. It is currently in the process of modification and will transpose Regulation (EU) No 429/2016.
- The **normative framework for the meat and poultry** sectors is as follows:
- Government Decision No 624/2020[47], regarding the approval of the Quality Requirements for the meat, meat preparations, and meat products;
- Government Decision No 696/2010[48], for the approval of the Requirements regarding the production, import and placing on the market of meat - raw material;
- Government Decision No 1406/2008[49], for the approval of the sanitary-veterinary norms regarding the labelling system of beef and beef products;
- Government Decision No 48/2009[50], regarding the approval of the Sanitary-Veterinary Norm regarding animal and public health conditions and sanitary-veterinary certification for the import into the Republic of Moldova of certain live animals and fresh meat from them;
- Government Decision No 773/2013[51], regarding the approval of the Sanitary-Veterinary Norm establishing the requirements for the sale of poultry meat;

45. https://lege.md/act/zootehniei
46. https://www.legis.md/cautare/getResults?doc_id=133184&lang=ro#
47. https://www.legis.md/cautare/getResults?doc_id=123163&lang=ro
48.https://www.legis.md/cautare/getResults?doc_id=103341&lang=ro#
49. https://www.legis.md/cautare/getResults?doc_id=124081&lang=ro#
50. https://www.legis.md/cautare/getResults?doc_id=48390&lang=ro
51. https://www.legis.md/cautare/getResults?doc_id=130549&lang=ro#

- Government Decision No 560/2015[52], regarding the approval of the Animal and Public Health Norm, as well as the certificate models for the import of certain treated meat products, stomachs, bladders, and intestines intended for human consumption.

The **normative framework for the eggs** sector:

- Government Decision No 1208/2008[53], regarding the approval of the Sanitary-Veterinary Norm regarding the marketing of eggs for human consumption;
- Government Decision No 357/2012[54], for the approval of the Sanitary-Veterinary Norm regarding the marketing and import of domestic birds and hatching eggs.

The **normative framework for the milk** sector and dairy products:

- Government Decision No 158/2019[55], regarding the approval of the Quality Requirements for milk and dairy products;
- Government Decision No 711/2014[56], for the approval of the Sanitary-Veterinary Norm regarding the establishment of animal health and public health conditions and sanitary-veterinary certification of imports of raw milk, dairy products, colostrum, and colostrum -based products intended for human consumption;
- Government Decision No 1324/2008[57], for the approval of the Sanitary-Veterinary Norm regarding animal health and veterinary public health requirements and sanitary-veterinary certification of imports of heat-treated milk, dairy products and raw milk intended for human consumption.

Investment policy

Under Moldovan law, foreign companies enjoy national treatment in most respects. The Law on Investment in entrepreneurship[58] prohibits discrimination against investments based on citizenship, domicile, residence, place of registration, place of activity, state of origin, or any other grounds.

The government is committed to strengthening Moldova's investment and business climate to attract foreign investment, which will help mitigate the negative economic impact of the COVID-19 pandemic, energy crisis and disruptions to Moldovan economy.

Moldova has an investment promotion agency[59] to assist prospective investors with information about business registration or industrial sectors, facilitate contact with relevant authorities, and organize study visits.

Moldova has signed bilateral investment protection and promotion agreement with 44 countries and investment treaty double taxation avoidance treaties with 50 countries.

State support from the government is allocated through the subsidy fund and the subsidy policy is elaborated by the MAFI and implemented by the AIPA, provided in the Law No 71/2023[60], regarding subsidies in agriculture and the rural environment.

The regulations regarding the distribution of the subsidy, the national fund for the development of the agriculture and the rural environment, can be accessed on the AIPA website[61].

Tax and customs policy

Customs relations and cooperation between the EU and Moldova are part of the EU's overall political and economic relations. Moldova is a partner country of the Eastern Partnership and of the European Neighbourhood Policy. The EU and Moldova agreed on a new Association Agenda in 2022.

The Association Agreement between the EU and Moldova signed on 27 June 2014 and entered into force on 1 July 2016, contains several economic and trade cooperation rules, including general provisions on:

- Customs and trade facilitation (Chapter 5, art, 192-201);
- Taxation (Chapter 8, art. 52-57).

52. https://www.legis.md/cautare/getResults?doc_id=125626&lang=ro#
53. https://www.legis.md/cautare/getResults?doc_id=130496&lang=ro#
54. https://www.legis.md/cautare/getResults?doc_id=48276&lang=ro
55. https://www.legis.md/cautare/getResults?doc_id=113282&lang=ro
56. https://www.legis.md/cautare/getResults?doc_id=125623&lang=ro#
57. https://www.legis.md/cautare/getResults?doc_id=67622&lang=ro
58. https://www.legis.md/cautare/getResults?doc_id=138560&lang=ro#
59. https://invest.gov.md
60. https://www.legis.md/cautare/getResults?doc_id=136602&lang=ro
61. https://aipa.gov.md/ro/content/regulamentele-de-subventionare

The EU and Moldova Association Agreement introduces a preferential trade regime, the DCFTA. This preferential trade system has allowed Moldova to benefit from reduced or eliminated tariffs for its goods, and increased services market and better investment conditions. An important part of DCFTA is aligning Moldovan trade-related laws to selected EU legislative acts.

The standard **Value-added tax (VAT)** rate in Moldova is currently 20%. It is applied to local supplies of goods and services, as well as to import of goods and services through a reverse-change mechanism. Apart from the above, for instance, local supplies of milk and dairy products and zootechnical products are subjects of reduced VAT rates – 8% VAT rate.

As a member of the World Customs Organization, Moldova applies import tariffs on goods classified pursuant to the International Harmonized Commodity Description and Coding System (HS). Customs duties are assessed on the value of goods (ad valorem duty), in-kind quantity or combination or the two. The ad valorem customs duty has the widest application, ranging from zero to 25 % of the value of imported items. A combination of the two is applied to a range of imported meat products. The trade-weighted average rate of customs duties[62] is 4,2% for all goods and 11,2 % for agriculture products.

Business Associations

Business Associations of the meat, poultry and dairy products value chains in the Republic of Moldova are Non-Governmental Organizations and their scope of activities is to promote the interest of associations 'members and advocate the sectorial priorities, lobbying for the meat, poultry and dairy products sector; promotion legislation and protection of consumers rights; establishment of a qualified advisory service for members; promotion of the establishment of meat, poultry, and dairy products market; identification of the problems faced by farmers, producers, and processors; consultative training sessions to help members on farm and quality management, food safety principles, regulations.

During the period from August 14, 2023, to September 25, 2023, a several interviews were conducted with 8 Business Associations, 7 of them also contributed and participated in completing the questionnaire and providing information used in the Study (Annex 11).

Public Association "Farmers - Milk Producers Association": The association was established in 2017 by the farmers - milk producers. Currently the associations consist of 101 members. The organization has a representative in all regions of Moldova. The aims of the association are to identify farmers' needs and corresponding support for the sustainable development of the Moldovan milk sector.

National Association of Milk and Dairy Producers "Milk": The association was founded in 2012 with the idea and need to promote the milk sector, thus bringing together milk producers (farmers) and processors. Currently it has over 60 members and it is the association that promotes interest of the business in the milk processing and dairy products export sector.

Employers' Association of Poultry sector from the Republic of Moldova: The field of the association is poultry farming and started the activities in 2018 with 23 members currently. The association is committed to strengthening the poultry sector in the country to achieve the results of poultry meat export to the EU market.

Association of the Union of Poultry Industry Producers of the Republic of Moldova: The association with the largest activity experience in the poultry value chain, founded in 2009 and which brings together 7 poultry producers of the country and promotes the interests of the members since the foundation of the association.

Enterprise Patronage Meat Processing Industry: The association was created in 2011 and now has over 14 members, meat producers, processors, and slaughterhouses. The association's main functions are to promote the meat industry sector, to support knowledge exchange and the adoption of the best practices as well as to provide networking opportunities and collaborations with the governmental institutions.

National Federation of Sheep and Goat Breeders from the RM: The federation started the activities in 2008 and since then promotes the interests of the sheep and goat farmers and currently counts 25 farmers from all over the country.

Public Association of Cattle, Sheep and Goat Breeders from Orhei district: The association was established in 2015 with the purpose of union of cattle, sheep, and goat breeders from Orhei district. Currently brings together 87 members from all regions of Moldova including cattle, sheep, and goat breeding farms.

Association of Pork Producers: The association was

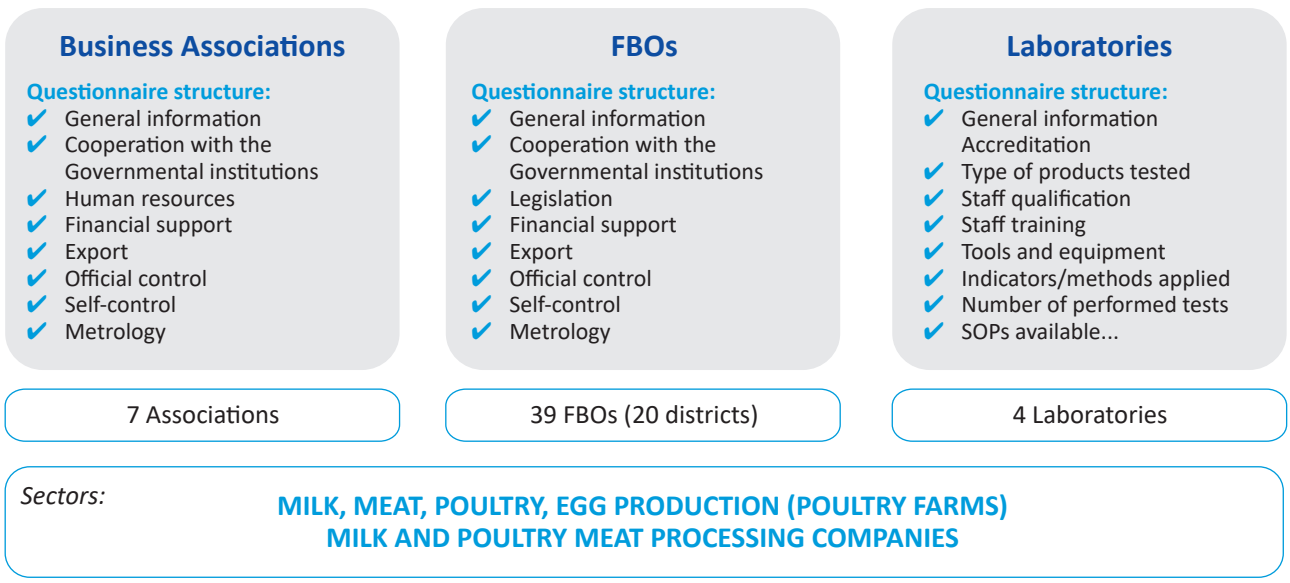
62. https://www.trade.gov/customs-info-database-user-guide

founded in 2015 and unites 12 founders, farmers – pork producers, the largest companies from Moldova with the prospect of joining others small and medium-sized producers in the country.

Stakeholders survey

In order to conduct a broad and comprehensive analysis of the situation in the meat, poultry, and dairy value chains, questionaries were developed for FBOs, business associations and quality infrastructure system operators.

Figure 45. Stakeholders survey



Source: Elaborated by the authors

The survey's questions covered: the general information about association; cooperation with the Governmental institutions; human resources; financial support; export; official control; self-control and metrology sections. From the business sector 7 associations and 39 FBOs from 20 districts of the country were respondents to the survey provided.

Following the discussion held with the representatives of the business associations and the answers to the questionnaires by the FBOs (see Annex 11), the following key aspects and challenges were identified.

Challenges:

- A request from associations is to create working groups with the ANSA on the multiple segments (animal identification and traceability, animal welfare, self-control implementation, by-products etc.). A more efficient mechanism is needed for informing FBOs in the field of animal husbandry and food safety.
- Self-control implementation – systematic surveillance through microbiological examinations is carried out in accredited diagnostic laboratories, established on a percentage of samples collected according to necessity and risk analysis, such as: meat samples, blood samples, samples from incubators, corpses, according to the established annual program. Milk-producing farms carry out daily milk control samples when milk is delivered to the processing units for parameters such as density, acidity, and fat content. In the dairy farm sector, self-control still needs to be implemented.
- Farmers see a continuous decrease in the labour force, a lack of qualified staff and the inability to provide adequate wages. Demographic trends in the Republic of Moldova show negative long-term prospects for the supply of labour in the milk production sector. There is a staff crisis in livestock farms and an acute lack of labour in the countryside, farmers are making more effort than before to recruit staff. Human capital in farms is from rural areas, most of the workers who have acquired production training (officially recognized) in a certain speciality (animal husbandry, veterinary medicine) are retired or on the threshold of retirement age.
- The Milk Association needs financial support for the procurement of machinery and equipment for the purpose of providing veterinary services to the Association's members, including: apparatus for ultrasound, laboratory for milk and feed quality control, equipment and accessories for hoof

cleaning, rapid tests for performing the analysis of ketone bodies in the blood, and technical support for the training of specialists regarding the use of the above-mentioned laboratories, machines, devices and equipment.

- Trainings to improve knowledge are needed in the fields of animal husbandry, veterinary medicine, hygiene and milking techniques, podiatry, ultrasound, artificial insemination of cows (working technique) and cattle nutrition, etc. Trainings require funding, and Associations are currently fully supported by membership fees and do not have finance for implementation of training programs for their members.
- Farmers are inspected by ANSA for official control 2-3 times/year. The processing companies are inspected by ANSA for official control 6-8 times/year. The official control and sampling are carried out without prior notification to farmers. Farmers are informed about official controls through the publication by ANSA of the lists of enterprises planned for verification. The conclusions and recommendations in the prescriptions issued by ANSA are clearly provided and understandable. Farmers obtain official control test results on paper and/or online.

3.6 SWOT analysis of meat, poultry, and dairy product value chains

Strengths, Weaknesses, Opportunities and Threats identified following the discussion with representatives of business associations as well as following the discussion with FBOs directly are reflected in the SWOT analysis.

Table 23. SWOT analysis of meat, poultry, and dairy product value chains

Strengths	**Weaknesses**
• Existence of professional business associations and good collaboration with government institutions; • Government support (subsidies) for the development the meat, poultry, and dairy products sector; • Ongoing process of harmonization the legislative framework; • Potential to cover the need for animal feed in the livestock sector; • Existence of enterprises with the processing capacities for the meat, poultry meat, eggs, and dairy products; • Developed guidelines for FBOs regarding the EU requirements for the export of poultry meat, eggs and for the supervision of milk production.	• Low FBOs competitiveness and cooperation; • Low resilience to shocks; • Narrow range of products; • A small number of trading partners; • Compliance issues; • Insufficient education of producers; • Insufficient level of production compliance with animal health and welfare, food safety and environmental protection standards; • Lack of qualified personnel.
Opportunities	**Threats**
• Increasing milk production to ensure domestic market demand and the competitiveness of the meat, poultry, and dairy products; • Diversification of the export market and diversification of products, promotion of traditional products; • Development of clusters, production, and marketing groups, as well as other forms of association; • Implementation of the quality management system; • Development of sustainable livestock production; • Farming of other poultry species (turkeys, ducks); • Application of voluntary food operator standards for the purpose of exporting products to foreign markets (BRC, IFC, etc.).	• Adverse climatic phenomena; • Triggering of regional epizootic phenomena; • Geopolitical situations and competition from neighbouring countries; • Demographic processes leading to the decrease of the labour force and the volume of consumption; • Lack of financial resources and weak financial potential for development; • Higher cost of labour.

Source: Elaborated by the authors

4.

Detailed mapping and performance analysis of the NQIS institutions

The policy-making body in the field of accreditation and conformity assessment

The state policy in the field of accreditation and conformity assessment is elaborated by the central specialized body of the public administration responsible for the quality infrastructure - the Ministry of Economic Development and Digitalization[63].

The national accreditation Body

The accreditation activity is carried out by the National Accreditation Centre, designated as the unique national accreditation body, with the abbreviated name "MOLDAC". It is a public institution, monitored by the specialized body of the central public administration responsible for the quality infrastructure, it is not subordinated to any public or private body. MOLDAC exercises its functions and attributions based on a regulation, approved by the Government with the prior approval of the Economy, Budget and Finance Commission of the Parliament. MOLDAC is a non-commercial organization that operates on a non-profit basis[64].

Accreditation Board

To ensure impartiality, development and compliance with the principles and operating policies, as well as the effective and balanced participation of all directly or indirectly interested parties in the activity of the National Accreditation Centre, an accreditation council is established within it; the council is a consultative body working unsalaried and its decisions are not mandatory to follow.

The accreditation council consists of 11 members. The organization and functioning of the Accreditation Council, as well as the method of election/appointment of members are established in the Council's regulations, developed, and approved by the National Accreditation Centre, with the consent of the interested parties.

The composition of the Accreditation Council is approved by the National Accreditation Centre based on the proposals made by the representatives of the interested parties, namely: accredited conformity assessment bodies; beneficiaries of conformity assessment activities; consumers; authorities with regulatory functions interested in the development of accreditation and conformity assessment.

Conformity assessment can be compulsory or voluntary. Conformity assessment in the regulated area shall be made only by the accredited conformity assessment bodies. The conformity assessment of products with essential requirements shall be performed by applying, at the discretion of manufacturer, of one of the conformity assessment procedures set out in the applicable technical regulation.

If a conformity assessment body finds that the requirements of the technical regulations applicable to the product or harmonized European standards adopted as Moldovan standards or relevant technical specifications have not been met by the manufacturer, it shall require the manufacturer to take appropriate corrective measures and shall not issue a certificate of conformity.

If, during the monitoring of conformity, following the issue of certificate, a conformity assessment body finds that a product is no longer conformant, it shall require the manufacturer to take appropriate corrective measures and shall suspend or withdraw the certificate, as appropriate. The conformity assessment body shall cooperate with other conformity assessment bodies, which perform similar conformity assessment and cover the same products by providing relevant information on issues of negative results of conformity assessments and, upon request, positive results of conformity assessments.

Certification

During the process of conformity certification of the products by the accredited certification bodies, the conformity of the products with the applicable essential requirements is attested, in accordance with the modules and certification schemes approved by the Government.

Inspection

The aim of inspection is to perform the assessments upon the request of economic agents and/or of public administration authorities, having the objective to deliver the information regarding the conformity with regulations, standards, or other specific requirements of the inspected object to the party concerned. The benchmarks of the inspection may include elements related to quantity, quality, security, and usability, and to ongoing compliance of security in the functioning of the objects or industrial systems.

63. https://mded.gov.md/en/
64. https://acreditare.md/en/

Testing

Testing is determined by an accredited laboratory of one or several characteristics of an object that is being subjected to conformity assessment based on a procedure. Testing may be a part of inspection or certification in conformity with the applicable technical regulations.

4.1 Mapping of the existing actors of conformity assessment services

The Metrology, Standardization and Conformity Assessment Section is a structural subdivision within the Quality Infrastructure and Market Supervision Directorate of the Ministry of Economic Development and Digitization. The mission of the section is to ensure the organization and coordination of standardization, metrology, accreditation and conformity assessment and technical regulation activities at national level.

The National Accreditation Body MOLDAC accredits Conformity Assessment Bodies according to the General Criteria for Accreditation, code CA, which are mandatory for Conformity Assessment Bodies.

The General Criteria for Accreditation, code CA, are those presented in the relevant normative documents for the operation of the Conformity Assessment Body (CAB), the reference standards, the documents of the European and international organizations EA, IAF, ILAC.

MOLDAC accredits **conformity assessment bodies** based on the reference standards and issues accreditation certificates. The conformity assessment is carried out on a mandatory or voluntary basis by the following bodies:

- Testing laboratories;
- Calibration laboratories;
- Inspection bodies in the field of conformity assessment;
- Product certification bodies;
- Management systems certification bodies;
- Organizers of interlaboratory test schemes;
- Conformity assessment bodies for new areas established by EA-European Cooperation for Accreditation or by authorities with regulatory functions.

Table 24. Actors for conformity assessment services in the Republic of Moldova

Name	Official status and Contact data	Role in the Conformity assessment services
Ministry of Economic Development and Digitalization	central public administration https://mded.gov.md	Policy-making body in the field of accreditation and conformity assessment
Ministry of Agriculture and Food Industry	Central public administration https://maia.gov.md/en	Policy-making body in the field of food safety and quality control
MOLDAC	public institution https://acreditare.md/en/	National accreditation body Accredits conformity assessment bodies based on the reference standards and issues accreditation certificates
National Institute of Metrology	Public institution https://inm.md/rom	Calibration – assuring traceability and, consequently, the credibility, at regional and international level, of the measurements
Standardization Institute of Moldova	Public institution https://standard.md	Policy implementation body in the field of standardization subordinated to the MDED
Centre for applied metrology and certification (E-CMAC)	State enterprise Chisinau, 28 E. Coca str.	Food safety management system certification body. Offering calibration certification services
CRDV testing laboratories	Public institutions Chisinau, 3 Murelor str	Testing laboratories of food products and animal health
ANSP laboratories	Public institution Chisinau, 67, Gh. Asachi str.	Testing laboratories of food products, Food additives, food supplements, Mineral and drinking water.
SA Bessarabia Nord	Private laboratory Balti, 90 Victoriei str	Meat products testing laboratory within the meat processing company

(continue)

Name	Official status and Contact data	Role in the Conformity assessment services
Imunotehnomed SRL	Private laboratory https://imunotehnomed.md	Food products testing laboratory
Centre for Applied Metrology	State enterprise Chisinau, 28 E. Coca str	Product certification body
Conservstandard SRL	Private company Chisinau, 11, Uzinelor str.	Product certification body
Centre for Applied Metrology	State enterprise Chisinau, 28 E. Coca str	Quality management system certification body
ANSA	https://www.ansa.gov.md	Inspection body

Source: Elaborated by the authors

4.2 CAB's structure and descriptions

Conformity Assessment Bodies and accreditation reference:

- ***Laboratories:*** Testing Laboratories (SM SR EN ISO/CEI 17025); Calibration Laboratories (SM SR EN ISO/CEI 17025); Metrological Verification Laboratories (SM SR EN ISO/CEI 17020);
- ***Certification bodies:*** Product Certification Bodies (SM SR EN 45011 / SM SR EN ISO/CEI 17065); Quality Management Systems Certification Bodies (SM SR EN ISO/CEI 17021); Food Safety Management Systems Certification Bodies (SM SR EN ISO/CEI 17021 combined with SM SR ISO/TS 22003);
- ***Inspection bodies:*** Inspection Bodies (SM SR EN ISO/CEI 17020).

If one of the accreditation benchmarks is revised or a new accreditation benchmark appears, MOLDAC automatically adopts the changes in its criteria, and grants its clients a reasonable period for the transition, according to the Information Documents published on the website[65] The duration of an accreditation cycle is 4 years, and the CAB must request re-evaluation 6 months before its expiration, submitting to the MOLDAC secretariat the set of documents and records according to the List of documents submitted by the CAB. If the request for reassessment was not submitted by the CAB months before its expiration, the validity period of the accreditation certificate is not extended, and the CAB request is registered for initial accreditation (at the end of the initial accreditation process, the CAB receives an Accreditation Certificate with a new number).

The re-evaluation is as comprehensive as the initial evaluation and aims to fully verify the compliance of accredited bodies with all accreditation criteria. Thus, during a reassessment visit, all elements of the management system and technical activities are assessed, as in the initial assessment.

The MOLDAC evaluation team considers all the information and experience accumulated during the previous evaluations, carried out in the previous accreditation cycle.

MOLDAC has the right to suspend accreditation when the CAB does not meet the accreditation requirements or does not respect the accreditation rules.

In case of withdrawal of accreditation, MOLDAC excludes the CAB from the Register of accredited CABs, published on the website, stating whether the withdrawal was at the request of the CAB or decided by MOLDAC, and the accreditation contract is considered terminated by law.

Accredited Conformity Assessment Bodies

Food Safety Management Systems Certification Bodies[66]

Accredited according to SM SR EN ISO/ CEI 17021-1:2015 and SM ISO/TS 22003:2014

1. The Food Safety Management Systems Certification Body within the SI "Center for Applied Metrology and Certification".

65. www.acreditare.md

66. https://acreditare.md/register_category/organisme-de-certificare-sisteme-de-management-al-sigurantei-alimentelor/

Testing Laboratories (TL)[67]

Accredited according to SM EN ISO/IEC 17025:2018

1. TL from the IP "Republican Veterinary Diagnostic Center" (CRDV) (Chisinau – food products and animal health, Donduseni – food products, Drochia – animal health, Cahul – animal health);
2. TL of IP "Central laboratory for testing alcoholic/non-alcoholic beverages and canned products";
3. Laboratory testing centre of the National Agency for Public Health;
4. TL of SA "Basarabia-Nord";
5. Laboratory SC "Imunotehnomed" SRL;
6. TL of the Laboratory Diagnostic Section within the CSP Chisinau municipality of ANSP.

Calibration Laboratories[68]

Accredited according to SM EN ISO/IEC 17025:2018

1. Calibration Laboratory within the ÎS "Center for Applied Metrology and Certification".

   Geometric quantities, mass and temperature are measured quantities. The calibration objects are Vernier callipers; Digital callipers; Sieve for sifting; Liquid glass thermometers; Digital/electronic thermometers; Thermostatic premises (air thermostats, liquid thermostats including rooms, cabinets and sterilizers with dry air, sterilizers with moist air - autoclaves, electric ovens); Weight classes E2, F1, F2, M1-M3; Special weights; Weighing devices with non-automatic operation.

   The principle of the calibration method is direct comparison and for weights the principle of the method is by comparison with standard weights using the substitution method.

2. The Calibration Laboratories within the IP "National Metrology Institute" *(partial suspension of accreditation until 27.10.2023).*

   Measured/calibrated quantity: Mass, Force, pressure, Volume, Length, Liquid flows, Gas flows, Liquid density, Hydrogen ion concentration, Electrolytic conductivity.

   The principle of the calibration method is Substitution, Direct Comparison, Direct Measurement, Indirect Measurement, Gravimetric Method, and Volumetric Method.

3. The Calibration Laboratory within SRL "Alex System".

   Calibration objects are Weights of classes F2, M1 – M3; special weights; Weighing devices with non-automatic operation, including mass comparators.

The principle of the calibration method is direct comparison by substitution method.

Product Certification Bodies[69]

ACCREDITED ACCORDING TO SM EN ISO/CEI 17065:2013

1. OC produced within the S.S. "Center for Applied Metrology and Certification".
2. OC products "Conservstandard" SRL.
3. OC products from the IP "Central laboratory for testing alcoholic/non-alcoholic beverages and canned products".

Quality Management Systems Certification Bodies[70]

ACCREDITED ACCORDING TO SM SR EN ISO/ CEI 17021-1:2015 and SM EN ISO/IEC 17021-3:2019

1. Quality Management Systems Certification Body within the S.S. "Centre for Applied Metrology and Certification".

Inspection Bodies[71]

ACCREDITATION ACCORDING TO SM EN ISO/CEI 17020:2013

1. ANSA - Not accredited.

Implementation of Quality standards (HACCP and ISO 22000)

The characteristic of food safety is the absence of foodborne hazards at the point of consumption. These hazards can occur at different stages of the food chain, therefore

67. https://acreditare.md/register_category/laboratoare-de-incercari/
68. https://acreditare.md/register_category/laboratoare-de-etalonari/
69. https://acreditare.md/register_category/organisme-de-certificare-a-produselor/
70. https://acreditare.md/register_category/organisme-de-certificare-sisteme-de-management-al-calitatii/
71. https://acreditare.md/register_category/organisme-de-inspectie/

adequate controls throughout the network are essential. Food safety is ensured through the combined efforts of all the parties participating in the food chain, from feed producers and primary producers to food manufacturers, transport and storage operators and subcontractors, right through to retail and food service outlets. HACCP involves identifying potential hazards in the food production process and implementing control measures at critical points to ensure food safety. Thus, according to EU requirements, HACCP implementation is compulsory for all FBOs of animal origin. There are international quality standards which cover HACCP and other processes related to food handling. ISO 22000 Food safety management systems – Requirements for any organization in the food chain, is recognized internationally as the most relevant document supporting the development of a food safety management system (FSMS).

According to ANSA data, the total number of FBOs of the meat, poultry, and dairy products value chains, 290 enterprises, 66 enterprises (approximately 23%) have implemented the HACCP or ISO 22000 quality standard, some enterprises implemented HACCP and ISO quality standards. 25 slaughterhouses have implemented HACCP or ISO 22000 (ISO 2200 – 9 enterprises and HACCP – 18 enterprises), out of the total number of 159 authorized, which represents 16%.

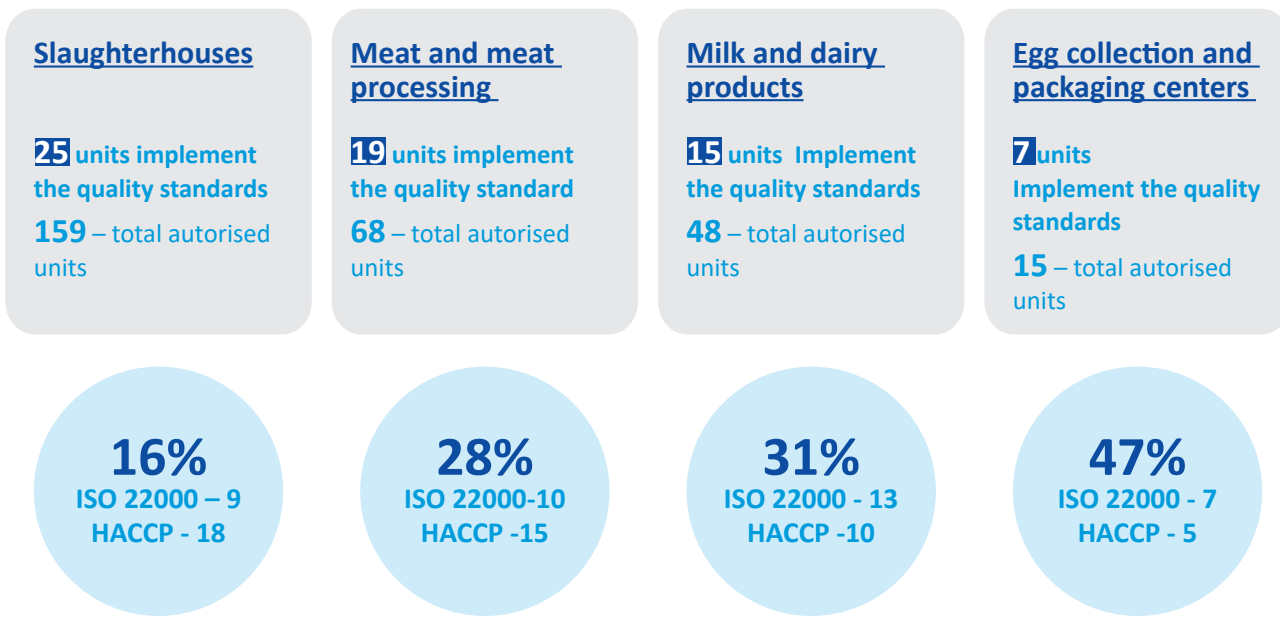
FBOs of Meat Processing Units have implemented ISO quality standards in a proportion of 28%, out of the total number of authorized enterprises - 68, implemented ISO 22000 - 10 enterprises and HACCP - 15 enterprises.

The value chain of milk and dairy processing products, on a total number of 48 enterprises, 15 FBOs, in proportion of 31%, have implemented the quality standards (8 units – have implemented HACCP and ISO, 5 units – only ISO, and 2 units – only HACCP.

The sector of egg production, collection and packaging centres has the highest rate of implementation of quality standards, accounting for 47% of the total number of enterprises. Out of 15 companies, 7 companies have implemented the ISO 22000 standard and 5 have also implemented HACCP.

The implementation of HACCP and certification of ISO 22000 is in progress, therefore further support from the government by subsidizing investments is needed.

Figure 46. HACCP and ISO 22000 implementation



Source: Elaborated by the authors based on ANSA data

4.3 A detailed description of the testing laboratories

During the last decade, the Republic of Moldova initiated an extensive process of reorganization of the laboratory system. Thus, since 2018, ANSA has become the founder of 3 reference laboratories in its areas of control. Likewise, in 2023, the National Development Plan (PND) was approved by Government Decision No. 89/2023 for 2 years, where one of the objectives is „3) Strengthening the capacities of laboratories in the sanitary-veterinary and phytosanitary fields (action 1.2.38)".

With the support of donors, during the last 3 years, the system of animal health and food safety laboratories was strengthened by equipping, supplying, and training staff of national reference laboratories with a focus on poultry, eggs, milk, and dairy products.

Public and private laboratories are participating in the implementation of state monitoring programs as well as provide the services to FBOs.

The public Institution "Republican Centre for Veterinary Diagnostics", hereafter (CRDV) is a legal entity that operates as a self-financing Public Institution, according to the Government Decision No. 1211 of 05.12.2018, in which ANSA is founder. The governing bodies of the CRDV are the council - superior collegial body and the director - executive body.

The CRDV centre has the following functions:

- Carrying out laboratory investigations for the purpose of evaluating the health of animals and ensuring the implementation of surveillance measures under the conditions provided by the sanitary-veterinary legislation and for the sanitary-veterinary safety of products of animal origin;
- Performing laboratory investigations in the field of food safety and quality of food products and animal feed;
- Carrying out laboratory investigations to check the safety and hygiene criteria at food establishments and to verify the parameters that influence the safety and quality of animal feed;
- Conducting laboratory investigations in the field of quality control and food safety of veterinary drugs;
- Monitoring the health status of the animals regarding sanitary-veterinary activity;
- Collection, dissemination, and analysis of scientific information;
- Participation in the registration process of veterinary medicinal products in accordance with the functions assigned by the normative acts and by the founder;
- Performing certification activities of food products;
- Performing laboratory tests to establish or extend the shelf life of food products;
- Providing consultancy and expertise in the field of laboratory tests and providing methodological support/organizing training for laboratory staff from companies that are part of the food chain.

According to the organizational chart of the institution, CRDV has 6 laboratories in its structure:

- Food Products' Testing Laboratory in Chisinau;
- Food Products' Testing Laboratory in Donduseni;
- Food Products' Testing Laboratory in Balti (not functioning);
- Animal Health Diagnostics laboratory in Chisinau;
- Animal Health Diagnostics laboratory in Cahul (not accredited);
- Animal Health Diagnostics laboratory in Drochia.

CRDV is self-financing from January 15, 2021, and provides services according to the new approved tariffs (GD no. 994/2020), but the accumulated funds are minimally sufficient to maintain the CRDV's activity. The maintenance of the laboratory's activity is based on laboratory investigation, carried out within the state monitoring programs for food safety and animal health.

The services provided by the Animal Health Diagnostics laboratories present the strategic animal health activities of national interest, including investigative services for the diagnosis of animal diseases.

CRDV Food Product Testing Laboratory is represented by two functional subdivisions - in Chisinau (CRDV Chisinau) and in Donduseni (CRDV Donduseni), both laboratories are accredited to ISO 17025 requirements. CRDV Chisinau and CRDV Donduseni laboratories carry out tests within the monitoring programs and laboratory tests at the request of economic agents.

Animal Health Diagnostics Laboratory is represented by three functional CRDV subdivisions (Chisinau, Drochia, Cahul), two of them are accredited to ISO 17025 – Chisinau and Drochia.

CRDV Chisinau has three (3) LC/MS/MS units for the determination of drug residues by the confirmatory method. Methods for 10 groups of substances are implemented and accredited. A group of substances - Avermectins is implemented and accredited using HPLC.

CRDV laboratory's general challenges include the following:

- Cannot purchase materials, reagents, kits, consumables in the necessary quantities and on time, not to mention the procurement of equipment, and the addition of another laboratory;
- No financial coverage for starting the activity of the Food Products' Testing Laboratory in Balti;
- Lack of financial resources, necessary for the maintenance and development of the laboratory, is also generated by the lack of demand for investigative samples;
- The research of food safety indicators is mainly carried out in the Chisinau by the CRDV Food Products' Testing Laboratory;
- For an extensive activity of the laboratory in Balti, with enough tests to maintain activity, planning at ANSA level is necessary for monitoring programs and implementation of the self-control programs by FBOs, for the investigation of food products in three areas:
- Determination of drug residues in food products of animal origin (through the screening method) and determination of mycotoxins;
- Determination of quality indices in raw material milk, dairy products;
- Determination of microbiological indices in food products, including culinary products, raw material milk.

Laboratory testing centre of the National Agency for Public Health

The laboratory is accredited by the MOLDAC. Accreditation certificate No. LÎ-044 of 17.02.2022. Accreditation standard: SM EN ISO/IEC 17025:2018.

The laboratory is contracted annually by ANSA for the provision of laboratory services within the National Monitoring Program regarding the monitoring of organophosphorus, organochlorine and pyrethroid pesticide residues in poultry, pork, beef, and milk. The laboratory participates in national and international skills testing (PT) programs and uses TraceCERT Certified Reference Materials and analytical standards.

The laboratory plans to purchase equipment Gas chromatograph with FID detector, specific column for the determination of trans fatty acids in food products, as well as other equipment, UV-VIS molecular spectrophotometer, atomic absorption spectrophotometer with 3 types of atomization, and is needed training and technical assistance of methods for the determination of trans fatty acids in baby products, other products, dyes, Polycyclic aromatic hydrocarbons (PAHs) in food products by LC/MS/MS, GC/MS/MS, GS.

TL of SA "Bessarabia-Nord"

The laboratory is within the meat products processing and production company.

The laboratory tests performed are for raw meat and meat products. The type of tests performed are based on sensory methods, volumetric methods, photo colorimetric methods, gravimetric methods, and microbiological methods. By microbiological methods are determined the number of colonies at 300C, Coliform bacteria, Salmonella bacteria, Staphylococcus aureus, Listeria spp. presumptive, yeast, and meld.

Following the survey of FBOs, 23% of the respondents mentioned that they have a laboratory within the company (Annex 11).

Most of the milk processing and meat processing units mentioned that they have a laboratory within the company used in the technological production process (1-accredited, 7 – certified, 2 – not certified).

Analytical Laboratory within SC "Imunotehnomed" SRL

The private laboratory providing services regarding the tests of products and by-products of animal origin, animal feed, surface sanitation tests, etc. The laboratory is accredited by the MOLDAC according to the SM EN ISO/IEC 17025:2018 standard. General requirements for the competence of testing and calibration laboratories (Certificate of accreditation no. LÎ-105 of 18.03.2016).

The laboratory is contracted annually by ANSA for the provision of laboratory services within the state monitoring program. Being contracted by ANSA in the state monitoring program, the laboratory is a user of the LIMS software.

SC Imunotehnomed SRL is also a distributor of equipment from EU countries, together with the distribution and installation of laboratory equipment, it offers and ensures the maintenance of the equipment as well as the training of the technical staff.

Challenges:

- During the pandemic, the SC "Imunotehnomed" SRL laboratory applied the methods regarding the provision of laboratory diagnostic services in the

animal health segment and especially the production diseases of farm animals (through the Quantitative ELISA method - birds - e.g.: Avian Infectious bronchitis (IBV), New Castle disease (NDV) and Infectious Bursal Disease (Gumboro) - including (recombinant vaccine), Avian Adenovirus group 1, Avian infectious laryngotracheitis, etc. Pigs – e.g. Actinobacillus pleuropneumonia (App), Porcine Influenza, etc.). In the situation when the borders of the country were closed, the results obtained quickly allowed the manufacturers to take corrective measures in time.

- Since last year, Tylosin, Erythromycin, Trimethoprim and Lincomycin have been excluded from contracted services. The given methods were partially excluded from the scope of accreditation because the maintenance requires additional investments against the background of lack of requests.
- As far as the residue methods were accredited, the laboratory did not have any requests from local producers to determine antibiotic residues in meat, milk, eggs.
- Being from the private sector, the laboratory has the possibility to expand its field of activity in the determination of residues, ID tests, microbiological tests, veterinary-diagnostic tests with the inclusion of methods in the field of accreditation. At the same time for a private laboratory, collaboration with ANSA for the implementation of the State program is important in developing of new methods to be implemented.

Outcomes of Laboratories tests and methods

The **Regulation (EC) No 2073/2005** establishes microbiological criteria for certain microorganisms and the implementing rules to be complied with by FBOs. Microbiological criteria comparative analysis of the methods for meat, poultry, and dairy products was carried out, the data are in Annex 3.

Food safety criteria. At CRDV meat and meat products for microorganism Listeria monocytogenes are tested according to EN/ISO 11290-2 and EN/ISO 11290-2, detection of Salmonella is performed according to EN/ISO 6579-1 for meat and meat products, poultry products, and dairy products.

CRDV does not carry out the analytical reference method for Staphylococcal enterotoxins in dairy products due to a lack of equipment.

Process hygiene criteria analytical reference method of meat, poultry and dairy products for certain microorganisms are carried out according to EN/ISO standards as follows: for *Enterobacteriaceae* in egg products - according to EN/ISO 21528-2, for *Campylobacter* spp. in poultry products – according to EN/ISO 10272-2, in meat and meat products for *Aerobic colony count*– according to EN/ISO 4833-1, for *Enterobacteriaceae* – according to EN/ISO 21528-2, for *E. coli* – according to EN/ISO 16649-1, in dairy products for *Enterobacteriaceae* – according to EN/ISO 21528-2, for *Coagulase-positive staphylococci* – according to EN/ISO 6888-1 or EN/ISO 6888-2.

FBOs shall perform testing as appropriate against the microbiological criteria or verifying the correct functioning of their procedures based on HACCP principles and good hygiene practices and decide the appropriate sampling frequencies. The frequency of sampling may be adapted to the nature and size of the food businessesy.

Regarding the number of tests carried out it should be noted that the CRDV laboratory, both in the field of food safety and animal health, has increased the number of samples starting from 2020, see Annex 3. Sample numbers for heavy metals and residues of veterinary drugs has been increased by approximately 10%. On microbiological methods, the number of tests was increased by approximately 15%.

The number of tests performed at the ***Imunotehnomed*** laboratory for the determination of residue of veterinary drugs decreased by approximately 50% and for food chemistry methods decreased by 30%. The ANSP laboratory has considerably increased the number of tests for the determination of pesticide residues from 27 samples in 2020 to 1455 samples in 2022.

Table 25. The number of laboratories' tests for the years 2020-2022

Tests	CRDV Food				CRDV Animal Health				ANSP				Imunotehnomed			
	Change	2022	2021	2020	Change	2022	2021	2020	Change	2022	2021	2020	Change	2022	2021	2020
M/O	⇧	23400	21300	20520												
Water					⇧⇧⇧	38061	21	-	⇧	4392	3408	4206				
Food chemistry	⇧	10800	10520	9900									⇩	70	111	53
Pesticide residue									⇧⇧	1455	39	27				
Heavy metal	⇧	2500	2150	2300							17	22	⇔	35		
Residue of vet. drug.	⇧	2550	2350	2200									⇩⇩	151	512	358
Benzopyr-ene									⇩	44	80	57				
Radiology					⇔	224	266	233								

Source: Elaborated by the authors

NRMP implementation is done with the support of foreign laboratories also - as not all applicable tests at CRDV are accredited. For the implementation of the National Residue Monitoring Plan for 2023, ANSA established contracts with 3 laboratories from Romania (Bucharest, Constanta, Bacau) and a laboratory from Lithuania for testing the water used in livestock farms.

To implement residues monitoring program on animal products ANSA has contracted laboratories from Romania, for 29 groups of substances including Pesticides, Steroids, Aminoglycosides, Amphenicols, Corticosteroids and Glucocorticoids (Annex 15). Residues monitoring in animal products by CRDV is done on 20 groups of substances.

In 2024, CRDV is planning to expand the methods for determining residues for some groups of substances in different matrices (eggs, milk), the accreditation of the multi-residue method (screening) for determination of drug residues is planned (Annex 16). For the year 2025, the implementation and accreditation of the method for determining chloramphenicol and nitrofurans by LC/MS/MS is planned.

For the implementation and validation of other methods with already existing equipment, CRDV requires consumables: Analytical standards, Internal standards, Extraction cartridges, purification cartridges, Inserts, PDF filters (Annex 16). To validate the methods, a series of measurements are needed for a series of parameters; this requires certain quantities of consumables: cartridges, vials, filters, inserts.

In conclusion, to validate the methods, additional financial sources are needed, which CRDV does not have. The ANSA monitoring program does not cover the costs of maintaining residue determination methods, nor the validating and extending accreditation for the additional methods.

4.4 SWOT analysis of the laboratory infrastructure in the Republic of Moldova

The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis presents details of the favourable and hindering aspects – the laboratory (food) system and conditions – for the sustainable development of testing laboratories in the Republic of Moldova. This analysis is based on the study of available information, interviews and discussions including information collected through the laboratory questionnaires (Annex 12).

Following the FBOs survey (Annex 11), 77% of the respondents mentioned that they use the services of the reference laboratories and most of them are satisfied with the services provided by the laboratory. At the same time, 38% of the respondents mentioned that the complete package of indicators required for the product intended for export is not offered. In this case, the tests for the complete package of indicators required for the product intended for export are carried out in the laboratories of the export destination countries.

With reference to self-control implementation, most respondents, 95%, mentioned that the self-control implementation plan at the enterprise is checked by ANSA inspectors during the official control. Moreover 13% of the respondents have not heard of the self-control implementation plan at the company and do not have one. To evaluate the current situation on self-control implementation in raw milk sector, it should be mentioned that only CRDV can provide services on somatic cells samples. In accordance with the provisions of Government Decision 435/2010[72], Section 4, Criteria applied to raw milk, FBOs must implement procedures to ensure that raw milk meets the following criteria for raw milk from cows:

- Total number of germs per ml (NTG) at 30°C - < 100,000, determined as a variable geometric mean over a period of two months, with at least two samples per month;
- Somatic cells count per ml - < 400,000, determined as a moving geometric mean over a 3-month period, with at least one sample per month, unless the authority specifies another methodology, to account for seasonal variations in levels of production.

For implementation of the self-control in authorized cattle farms (244 cattle farms authorized by ANSA), it would be necessary to process 5856 samples per year for determination of the total number of germs, and 2928 samples per year for determination the number of somatic cells. According to CRDV confirmation, the laboratory can fully cover the request for samples (total number of germs and total number of somatic cells).

Table 26. SWOT for laboratories infrastructure

Strengths	Weaknesses
• The existence of public and private food and veterinary testing laboratories (the map of the laboratories); • Testing laboratories for official control are accredited; • A wide range of available tests based on ISO standards; • National Development Plan established in public policy documents for the development of the laboratory system; • Highly qualified laboratory staff, quality managers; • Equipment in new or good condition HPLC, GC, GC-MS MS, LC-MS-MS; • Participation in external proficiency tests and the organization of interlaboratory tests at the national level; • The existence and functionality of LIMS system; • The existence of collaboration agreements with other National Reference Laboratories from several countries (covering training, collaboration, communication in case of updating the requirements of the relevant normative acts); • Established National Quality infrastructure, standards, and accreditation; • Internal laboratory quality control is well established; • The existence of a recognized national metrological institution; • The existence of a recognized national accreditation body (MOLDAC); • ANSA's official control, including residue control in animal-origin products is coordinated by the European Commission.	• Lack of an effective single coordinating body for the laboratories system; • Limited financial resources available for the integration of newly built laboratory (for the Balti laboratory); • Few, but there are still areas where GOST standards are still used instead of ISO and EN (meat product testing, sensory test, yeast, and mould (dairy product testing), radioactive pollution); • Lack of clear requirements at the national level for the designation of national reference laboratories and their evaluation; • Poorly motivating salaries for employees of testing laboratories; • Missing affordable maintenance services; • Lack of funding budget for the exercise of the reference attributions of the reference laboratories; • Expand participation in External Quality Assessment to include testing of toxins and pesticides in food and feed; • Lack of organization for delivery of self-control samples from farms and processing establishments to laboratories, which are mostly located in Chisinau.

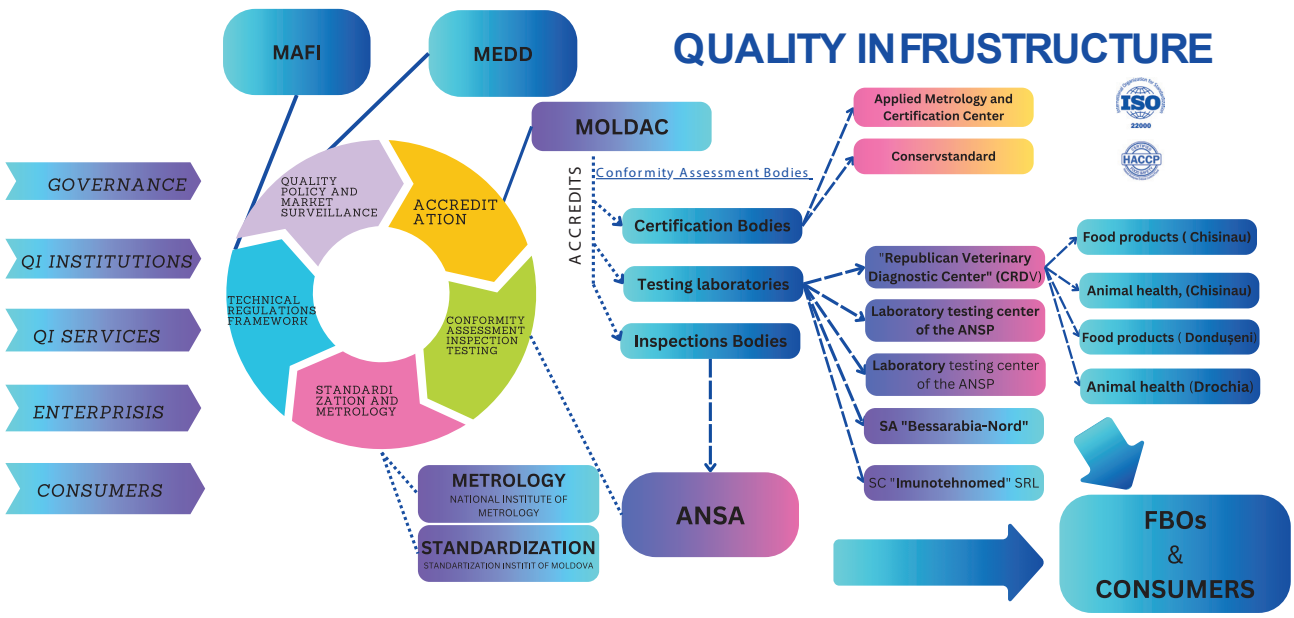
72. https://www.legis.md/cautare/getResults?doc_id=125564&lang=ro

Opportunities	Threats
• Moldova approves and implements EU legislation within the DCFTA framework; • Representatives of equipment and input manufacturers are present in the Republic of Moldova. • Annual development of monitoring programs based on risk criteria; • Many development projects include the food safety and laboratory collaboration;	• The university curriculum, course content and laboratory-related textbooks are partially outdated; • Reduced interest among young people towards the activity in the field of laboratories; • Insufficient scope and sustainability of continuing education options; • Difficult access to information; • Weak partnership link between research and industry; • The high price of equipment, consumables, reagents; • Relative awareness of food safety regulations (indicators) among FBOs;

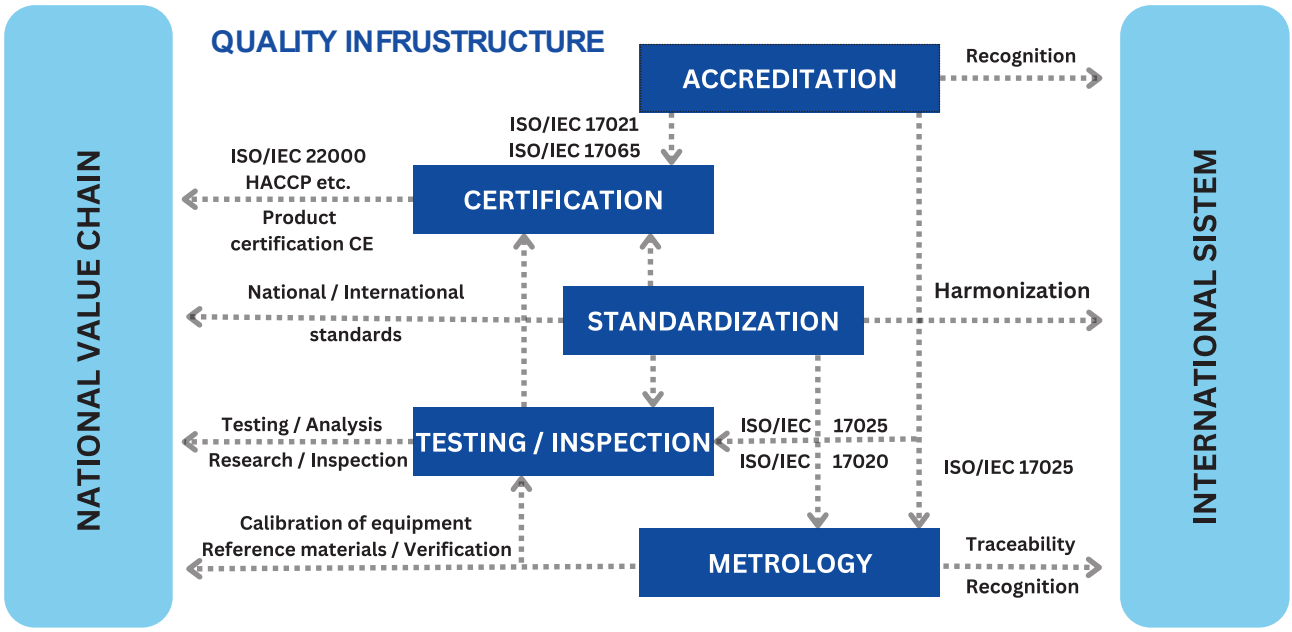
Source: Elaborated by the authors

4.5 Conformity assessment services - graphical representation

The conformity assessment body shall perform the conformity assessment procedure proportionately, avoiding unnecessary burdens for economic agents, taking into consideration the field of activity and the structure of a company, the complexity of the technology used for products and the serial or mass nature of production process. Meanwhile, the conformity assessment body shall comply with the level of required protection for the product conformity with the technical regulations applicable to the product.



Source: Elaborated by the authors



Source: Elaborated by the authors

4.6 Human capital supply institutions

The Technical University of Moldova the only higher education institution for the engineering in the Republic of Moldova. The university offers first-cycle studies, license studies in the field of food technology, public food management and food technology, engineering, and management in the food industry.

Following the reform in science and the merging of universities, the Agrarian University was merged with the Technical University. The Technical University now has the faculty of veterinary medicine and the faculty of agricultural, forestry and environmental sciences, which includes the department of animal resources and food safety and offers first-cycle studies, license studies in the field of animal husbandry, veterinary medicine, and food safety.

The Faculty of Chemistry and Chemical Technologies of the State University of Moldova is the one that offers the curricula for the specialists in the field of chemistry and chemical technologies, remaining for six decades a forge for highly qualified specialists in the technological fields.

4.7 Business support institutions

Donor assistance helped FBOs from the value chain of meat, poultry, and dairy products by applying to initiatives that were tangentially related to business development. International Finance Corporation (IFC), a member of the World Bank Group focused on the private sector in emerging markets aimed to support the meat, poultry, and dairy products value chain in Moldova across the last years with advice helping strengthen efficiency including regulatory reforms and business development in livestock sector and animal production.

There were no donor programs, credit schemes, grants or subsidies aimed at developing the livestock sector. The support programs for value chains of meat, poultry and dairy products were from the Government.

The subsidy policies are developed by MAFI, being the policy making body in the agri-food sector. Subsidy policies are implemented through AIPA, the Agency for Interventions and Payments in Agriculture.

The sector's subsidy policy is implemented on several dimensions: support in starting businesses, financing start-up projects; post-investment support, subsidizing investments in construction and equipping units in the meat, poultry, and dairy products value chain; and direct payment support, subsidies for animal owners.

4.7.1 State business support programs

Stimulating investments in the livestock sector, to increase the volume and quality of the products obtained, as well as the promotion of innovative production technologies, through:

- Establishment of animal husbandry;
- The construction or modernization of livestock holdings;
- Equipment or technological equipment;
- Purchase of breeding animals or other genetic resources.

For the construction or modernization of animal husbandry, the acquisition of technique, machinery and technological equipment, construction materials, resulting from the type of animal husbandry, is subsidized in the following proportions:

- 50% – for livestock holdings of cattle, pigs, birds, domestic rabbits, but no more than 10.0 million lei per beneficiary;
- 50% – for livestock holdings of sheep, goats, fish, and horses, but no more than 5.0 million lei per beneficiary.

For the purchase of breeding animals, including reproductive material (semen), subsidies are given in the following proportions:

- 50% – for primiparous cows or heifers at least 12 months old, but no more than 5.0 million lei per beneficiary;
- 35% – for authorized breeding bulls, from breeds specialized for meat production, aged 12-24 months, but no more than 1.0 million lei per beneficiary;
- 50% – for boars aged 4-8 months (pure breed and biracial) and un-inseminated gilts aged 4-8 months (pure breed and biracial), but no more than 800.0 thousand lei per beneficiary;
- 50% – for rams or goats aged 6-20 months, but no more than 200.0 thousand lei per beneficiary;
- 50% – for fawns or fawns aged 6-20 months, but no more than 1.5 million lei per beneficiary;
- 50% – for domestic rabbits, but no more than 200.0 thousand lei per beneficiary;
- 50% – for day-old chicks – broilers (parental forms), but no more than 1.5 million lei per beneficiary;
- 50% – for bull, ram, goat or heifer semen, but no more than 500.0 thousand lei per beneficiary.

Stimulating the development of the sector of primary/finished processing of products of animal origin, focused on the processing or marketing of products of animal origin and increasing the added value of finished products, through:

- Construction or modernization of milk, meat, egg, fish or bee honey storage units and products obtained from them;
- Construction or modernization of primary/finish processing units, slaughterhouse, cutting section, packaging, refrigeration, freezing or storage, of meat, milk, eggs, fish, bee honey and bee products;
- Modernizing the processes for carrying out test analysis for meat and meat products, milk and milk products, eggs, fish and fish products, honey, and bee products;
- Equipping primary/finished processing or marketing units with machines, installations, equipment, or specialized means of transport for the purpose of collecting raw material, processing and/or marketing products of animal origin.

The amount of the subsidy is 50% of the value of the eligible project, but not more than 5.0 million lei per beneficiary, except for slaughterhouses, where the maximum amount of the subsidy is 10.0 million lei per beneficiary, and milk processing units whose founder is also a milk producer, where the maximum amount of the subsidy is 12.0 million lei per beneficiary.

Direct payment, another form of subsidy in the livestock sector, is granted per head of animal and per kilogram of product, through AIPA. Direct payment is given to livestock farmers, for animals (cattle, sheep, and goats) registered and exploited in livestock holdings. The value of the direct payment granted to a farmer for each head of animal is determined according to the species and category and are as follows: for cattle from 3000 to 7000 MDL, for sheep and goats from 400 to 700 MDL.

Direct payments per kilogram of product, the new subsidy measure, to be implemented and granted quarterly to the farmer who owns animals, obtains, and delivers his own animal production (meat and milk) to the collection, processing, slaughtering, and marketing unit.

Following the FBOs survey results (Annex 11), 82% of the respondents mentioned that they received support from the government in the last 5 years, through the subsidy policy implemented by AIPA, and they are satisfied with the subsidy policy.

4.7.2 Donors' programs and projects

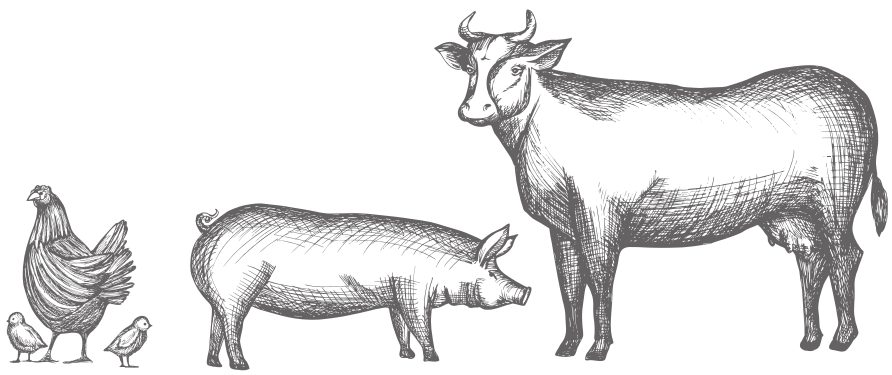
IFAD Consolidated Program Implementation Unit (CPIU IFAD)[73] created by the Government of the Republic of Moldova for the implementation of IFAD programmes supports with credits and grants in specially credit schemes for financing infrastructure projects, credits with grant portion for young and women entrepreneurs, where producers from the livestock sector can also benefit.

For the new IFAD IX project, which is to be launched, the financing directions were established for farmers in the livestock sector, (small ruminants - meat, and dairy sectors).

Extending the eligibility of investment projects that can be financed within the "Livada Moldovei"[74] project, implemented by the MAFI, after obtaining approval from the European Investment Bank, will allow access credits preferential in the total amount of 28 million euros. Investments in the livestock sector will be supported. The minimum amount for investment allocations will be five thousand euros, and the credit term will extend over a period of up to 10 years, including a grace period of a maximum of 4 years. Under the program, fiscal facilities will be granted, including the application of the zero VAT rate, as well as import advantages through the exemption of taxes and customs procedures and excise duties for imported machinery or services.

ADMA - the Agency for the Development and Modernization of Agriculture[75], through the various credit programs for the procurement of machinery and equipment, including for the animal products processing sector, finances segments of the value chain of meat, poultry, and dairy products. A separate program for financing the livestock sector through the agency is not implemented.

The Loan Agreement for the Project "Investments for Governance, Growth and Resilience in Agriculture" (AGGRI) was signed on June 5, 2023. The new financing project, with a value of 50.1 million euros, supports the sustainable development of agriculture in the Republic of Moldova, with the objectives of stimulating growth and improving the resilience of the agricultural sector, as well as promoting smart agricultural practices including livestock sector by awarding direct grants to the farmers. The project will be implemented by UCIMPA (The Consolidated Unit for the Implementation of Agriculture Projects)[76].



73. http://www.ucipifad.md/en/
74. https://livada-moldovei.md
75. https://adma.gov.md
76. https://www.capmu.md

5.

Identification and selection of priority products for exporting

The process of identifying meat, poultry, and dairy products with strong export potential to key trade countries, where demand is high, was conducted through two primary approaches:

1. Qualitative Approach: this involved interviews and discussions with key stakeholders, specifically MAFI, sectorial associations, and FBOs within the selected value chain;
2. Quantitative Approach: this approach utilized statistics for competitiveness assessment over the past decade. Key metrics considered include the number of enterprises and employees, business size and geographical distribution, turnover, as well as import and export statistics, among others.

In summary, the main criteria considered for identifying meat, poultry, and dairy products with strong export potential to key trade countries include:

- The potential of companies producing the products (supply side);
- Market potential of the product (demand side);
- Product, markets and suppliers with (unrealized) export potential;
- Opportunities for export diversification;
- Relevance of Quality Infrastructure for exploiting the market potential;
- Challenges facing the sector not directly related to quality;
- Synergies and complementarities;
- Preparation of country listing for import to the EU.

Consequently, the list of identified and prioritized meat, poultry, and dairy products with strong export potential to key trade countries, categorized by the source of identification, is presented in the following table.

Table 27. List of identified meat, poultry, and dairy products with good capacity to be exported, by source of identification

MAFI	FBOs	Associations	Statistical Analysis
-	-	Live sheep	Live bovine animals Live sheep and goats
Fresh meat	Fresh /frozen poultry meat, semi-preparation of poultry meat	Fresh /frozen semi-preparations of poultry meat	Frozen poultry meat
-	-	-	Frozen meat of sheep or goats
Red meat (planned to be ready in 4, 5 years)	-	-	Frozen meat of bovine animals
In special cheese (planned for the next two years to be ready)	Cottage cheese, brynza	Cottage cheese, brynza, semi-hard cheese	Cottage cheese, processed cheese, not grated or powdered.
Category A and B	-	Category A and B	Birds' eggs, in shell, preserved or cooked Fresh birds' eggs, in shell
-	Composite products with dairy products (cottage cheese, brynza)	Composite products with cottage cheese, brynza; Ice-cream (with milk, cream) Deserts (with milk)	-

Source: Interviews with stakeholders and statistical analysis

6.

Leverage points and recommendations

The findings of the Study analysis and the stakeholder Validation workshop in Chisinau on October 26, 2023, confirmed the demand for the urgent actions to promote and develop the sectors of live animals and animal products. In response, the following recommendations have been formulated to address the identified gaps:

- Strengthening institutional capacities in the process of harmonization and implementation of the EU requirements;
- Effective enforcement of official control at central and regional levels;
- Strengthening the coordination of the Labs in the country (Technical Committee or association);
- Increasing the financial means for investments and operational improvements for laboratories;
- Strengthening and developing the specialised knowledge and expertise to implement the laboratory policy;
- Consolidation of laboratory-client relations;
- Support programs in implementing quality standards and EU regulations;
- Involvement of Business Associations and FBOs in the negotiation process of the EU integration

To achieve tangible results, especially in this transitional period when Moldova is the pre access country to the EU, it is particularly important to organize processes in such a way as to achieve optimal results in a short time. The organization of the processes shall include a Road map that would identify the steps, actions, tasks, responsibilities, and implementation deadlines of all stakeholders in the value chains for meat, poultry, and milk in the Republic of Moldova, including the public and private sectors.

Recommendations for applying system changes are the core of this chapter, which offers the possibility of applying actions to achieve essential changes. The expected outcome of such actions is also described. Change actions and directions are proposed to build on existing strengths and opportunities and address critical weaknesses and threats to achieve a sustainable sector and to improve laboratory infrastructure. The priority of leverage points and recommendations considers two main factors: First is the practicability or the chance of a successful implementation. The second factor is the expected output in comparison to the input provided below.

LEVERAGE POINT 1: Strengthening institutional capacities in the process of harmonization and implementation of the EU requirements

Description: According to GD No 695/2017, MAFI is responsible for the harmonization of legal acts in the field of food safety and veterinary. Based on Law No 306/2018 on food safety (transposing the European Union Regulation 178/2002), ANSA is a competent inspection body in the country.

Article 25 of Law No 306/2018 on food safety has invested the Ministry of Health with the function of developing regulations in the field of food additives, contaminants, contact materials, and labelling, including nutrition and health claims.

The complete harmonization of legal acts is closely related to businesses and consumers. Not fully harmonized legal acts can damage business and the reputation of the country.

The analysis and collaboration with MAFI on harmonization of EU regulations and standards related to value chain products has shown that the main EU food safety legislation (Reg. 852/2006; Reg. 853/2006; Reg. 178/2002; Reg. 1169/2011; Reg. 2073/2005; Reg. 1333/2008; Reg. 1935/2004; Reg. 396/2005) and EU marketing standards (Regulation (EC) No 589/2008; (EC) No 617/2008; (EC) No 543/2008; (EC) No 445/2007; 2010/791) are transposed into national legislation, but some of them (Reg. 396/2005; Reg. 1333/2008; Reg. 1881/2006) are not updated according to the latest versions.

MAFI and ANSA establish the priorities for the implementation of essential new regulations. There are drafts of national legal acts which transpose the rules of Regulation (EU) 2016/429 Animal Health and Regulation (EU) 2017/625 regarding official control. Regulation (EU) 2023/915 related to value chain products on maximum levels for certain contaminants is relatively new. It is planned for transposition. It should be noted that this regulation establishes the obligation to examine new contaminants, such as perfluoroalkyl substances, for the meat of bovine animals, pigs, poultry, and sheep. This case shows that ANSA should include these substances in the monitoring plan, the resources will be needed, staff needs training on sampling procedures, interpretations of test results, etc.

In summary, there is a need for practical experience in the implementation of EU requirements for public employees. EU poultry meat marketing standards are transposed into legislation but not fully implemented on the spot in the enterprises. There is a need for a common approach of MAFI, ANSA and FBOs to the implementation of animal welfare, food safety and quality requirements.

Recommendation:

- Fully approximation of legislation, consultations with FBOs and Business Associations on deadlines of implementation;
- Strengthening capacities of institutions (experts, training, practical experience, study visits);
- Assistance of external experts for the implementation of requirements and methods;
- Cross-sectoral cooperation between FBOs and institutions (common approach to rules and their implementation).

The expected result:

- Fully transposed EU requirements into the national legal acts will lead to successful integration into the EU;
- Well knowledge experts on food safety and quality of EU requirements, including meat, poultry and dairy value chain in government institutions will help to properly implement the requirements in the entire food chain;
- Common approach to rules between FBOs and institutions will ensure it is necessary to ensure the smooth development of business in the country, as well as to promote the export of meat, poultry, and dairy products.

Actors involved: MAFI, ANSA, CRDV, Ministry of Health, and Business Associations.
Priority: Medium to High.

LEVERAGE POINT 2: Effective enforcement of official control at central and regional levels

Description: ANSA is the central public authority for food supervision whose general objective resides in the implementation of food safety policy, including feed, at all stages of the food chain, from primary production, processing, storage, transport and marketing. The main task of territorial subdivisions of ANSA is to carry out official control of FBOs, according to ANSA's approved standard operational procedures and the staffing limit for territorial divisions. Annually, ANSA prepares, based on the risk criteria, programs for official control (inspection) and sampling (in food safety and animal health fields) in order to verify the compliance of the products of animal origin produced and placed on the market. In accordance with the provisions of Law No 50/2013 regarding official controls for verification of compliance with the legislation on animal feed and food products and with animal health and welfare rules, inspections should be carried out without prior notification, except for cases such as audit, which requires prior notification of the operators. In the Study, the survey of FBOs showed that most companies are notified in advance of inspection or sampling. It shows that the situation should be improved at the central and regional levels. The verification procedures of the inspector's competence are recommended to improve.
Starting in 2017, ANSA drafted and approved the standard operational procedures for the description of the inspection processes based on the requirements of ISO 17020. In this way, ANSA has approved 145 procedures: 19 general procedures and 126 specific procedures. All internal documents, the application of which influences the quality of services and processes, are issued after completing 3 phases: elaboration, verification, and approval. The system of quality management and control is not certified, but the principle of development, updating, and distribution is in accordance with the requirements of ISO17020:2013. The draft of the National Development Program for 2024-2026 includes accreditation for at least one area of inspection. In this situation, ANSA needs to be supported by the donors in the efforts to accreditation to the requirements of ISO 17020/2013.

Recommendation:

- Effective implementation of monitoring plans by competent inspectors (training, study visits to EU countries, evaluation of the competence of inspectors, verification of official control related to residue control, etc.);
- Training courses for verification of official control on residue in farms and slaughterhouses, especially for regional units;
- Accreditation of inspection bodies performing official control according to ISO 17020.

The expected result:

- Well-trained inspectors of the central and regional units are implementing the National Residue Monitoring Program, including sampling procedures at farm and slaughterhouse levels;
- By 2026, ANSA will have at least one area covered the accreditation based on the requirements of ISO 17020;
- ISO 17020 accreditation provides a wide array of benefits: ensures compliance with legal requirements;

collectively enhances the credibility, efficiency, risk management, customer satisfaction, marketability, and competitive standing of an inspection body. It's an investment that pays dividends in the form of increased trust, improved operational effectiveness, and expanded business opportunities.

Actors involved: ANSA and territorial subdivisions of ANSA, MOLDAC.
Priority: Medium to High.

LEVERAGE POINT 3: Strengthening the coordination of the Labs in the country (Technical Committee or association)

Description: Laboratories are a key component and are necessary for proving the compliance of products and services with regulations and conformity with market requirements. The data and information that laboratories provide are essential for transparent and trustworthy decision-making, especially those related to inspection and certification activities.

Development or strengthening of Laboratory Infrastructure (LI) is needed to optimize and efficiently use and avoid unintended waste of scarce resources, including duplication of laboratory services (e.g. water and food testing laboratories in several government ministries where demand for these services is limited), while public laboratories compete and with private sector laboratories. According to international organisations, the Government needs to take responsibility for the efficient and effective use of the available resources and provide overarching guidance for achieving their goals through cooperation with all stakeholders. Since there is no active LI coordinating body in Moldova and a lack of communication between government and private laboratories, there is a need for an appropriate Laboratory Policy (LP).

An LP can be a valuable tool by which MDED can unite all stakeholders around a common understanding of the current situation. It can guide all stakeholders in the 'what' of a country's LI. It can recognise and build on the existing laboratory related infrastructure, and set objectives for how it can be changed, adapted and upgraded. MDED could be an institution with a voice in the Government related to LI problems. This Study identified that the role of donors in coordinating the activities of laboratories and purchasing equipment is very important.

Recommendation:

- The creation of the Laboratory Coordination Technical Committee;
- Identification of Laboratories' demand;
- Development of LP.

The expected result:

- The newly created Technical Committee for strengthening the LI will ensure the development of a national LP and strategy, the direction of development, and cooperation between stakeholders;
- The government and private laboratories will be involved in the processes to improve the current situation and develop an action plan for future activities;
- Laboratories should work on the preparation of the short-term and long-term strategic plans, which are necessary for in-advance planning and proper allocation of financial and human resources for meeting the requirements of different customer categories: governmental institutions as well as businesses;
- The Technical Committee can also work on initiating the necessary changes to the legislation by developing the draft acts and submitting them to the government.

Actors involved: MDED is the policy-making body in the field of accreditation and conformity assessment in the country, the Ministry of Health, ANSA and the public institutions in which the Agency is a founder, the National Agency for Public Health, the Academy of Sciences, other private laboratories, organizations in the field of science and innovation under the Ministry of Agriculture and Food industry.

Priority: Medium to High.

LEVERAGE POINT 4: Increasing the financial means for investments and operational improvements for laboratories

Description: In the Republic of Moldova, there is an infrastructure of veterinary laboratories structured in 2 levels: the central level, the laboratory is represented by the Animal Health Diagnostic Laboratory in Chisinau and regionally by 2 laboratories based in the north - Drochia and the south - Cahul. The central laboratory and the one based in Drochia ensure laboratory testing for the animal health field, while the laboratory in Cahul is to be gradually integrated by ensuring the implementation of quality management procedures, staff training, provision of reagents, necessary personnel, initiation of testing laboratory, test validation, application to PT tests and method accreditation.

Food safety laboratories are represented by a series of laboratories:

Public institutions:

- I.P. CRDV, I.P. LCF, I.P. LCTBANPC, in which ANSA exercises the capacity of the founder;
- Two ANSP laboratories;
- Laboratory of the State enterprise CMAC, and

Private institutions:

- Imunotehnomed SRL;
- SRL Basarabia Nord;
- Seven laboratories accredited by MOLDAC for testing dairy products.

The food product testing laboratory within the I.P. CRDV is organized into 2 levels: the central level represented by the testing laboratory in Chisinau and 1 regional laboratory based in Donduseni.

In 2022, ANSA transmitted to CRDV a renovated testing laboratory equipped with the support of donors based in Balti. In the absence of the budget allocated for the initiation of the activity of this branch, this effort seems impossible to achieve with CRDV own forces due to the lack of available budgetary resources. There is a start-up strategy for this laboratory with estimated expenses that include equipment installation, metrological verification and calibration, procurement of consumables, reagents, culture media, reference materials, diagnostic kits, staff training, method implementation, method validation, participation in PT tests and accreditation. There is limited funding from the founder for the development of the national reference laboratory for the purpose of implementing new methods. At the same time, there is support from donors in the procurement of technical equipment for the laboratory and the training of the laboratory staff.

From the available data, as a result of the deep analysis of the accreditation areas of all laboratories in the field of food safety, it was identified that many methods are based on ISO requirements; at the same time, methods based on GOST related to value chain products (for Yeasts and Molds; industrially sterilized canned food; sulphite reducing bacteria etc), these need to be transferred to recognized methods at European level. This fact must be followed more closely, especially considering the country's status as a candidate for the EU and through the implementation of the RM-EU association agreement.

Resources are needed as well for the implementation of ISO and EN standards.

Recommendation:

- Establishing the needs in testing infrastructure in the regions (Balti and Cahul) according to business and official control demands;
- Estimate of the annual budget allocated for the initiation of the branch activity for the field of food safety and animal health within the I.P. CRDV, this being NRL;
- Evaluation of methods based on GOST and gradual transition to ISO standards.

The expected result:

- The laboratory based in Balti for the field of food safety and Cahul for the field of animal health will be assessed for further activities, functions and financial needs;
- List of accredited and validated methods evaluated and identified ISO standards that will replace them;
- Applied methods that correspond to the requirements of the European Union;
- Quality and safety standards in accordance with the requirements of the European Union.

Actors involved: ANSA, CRDV, MAFI are responsible for the budget allocation line from the state budget account.
Priority: Medium.

LEVERAGE POINT 5: Management and availability of human resources (laboratory specialists)

Description: Each laboratory has a staffing profile of laboratory employees, and periodically, an assessment of personnel needs is carried out. According to the respondents, there are enough specialists, and the staff is well distributed throughout the territory of Moldova. Trained biomedical engineers/technicians are available. In Moldova, there are training programs and institutions for laboratory technicians. In addition, the country has no programs for postgraduate training of veterinary laboratory specialists. Also, there is an insufficient number of graduates among veterinary laboratory staff, and continuing education/training is not mandatory. The management of the knowledge and competencies of the laboratory workers is represented by the Job Descriptions, which are available at all levels for all the laboratory staff, and the assessment of the competence of the staff is carried out periodically. In addition, continuing/on-the-job training sessions on most laboratory topics are available and organized by laboratories, ANSA and/or international partners. However, there are no training programs in the field of laboratory management. Annual staff evaluations are carried out by monitoring professional performance.

In addition, staff turnover is very low, and the staff retention strategy is defined in CRDV 's quality plan. On the national level, there are professional associations of veterinarians and animal breeders/farmers. However, no such associations have been created for Food Safety Laboratory Specialists.

Recommendation:

- To establish appropriate programmes at different educational levels. These should aim to strengthen or develop the specialised knowledge and expertise needed to implement the Laboratory policy. Such interventions should include specialised adult training programmes as well;
- Continuing education will be expanded and diversified nationally;
- Application of measures for the growth and attractiveness of the laboratory sector for youth;
- Laboratories are encouraged to develop and implement training, development and registration programmes as part of developing career plans for their staff.

The expected result:

- Up-to-date lab-related higher education;
- Programs of education and improvement of existing knowledge at the national level;
- The laboratory sector is attractive to young specialists;
- The training programs for adult is developed and applied.

Actors involved: Education Institutions, Ministry of Education and Research, National Veterinary and Food Safety Reference Laboratories.
Priority: High.

LEVERAGE POINT 6: Strengthening laboratory-client's relations

Description: Many potential clients of food and animal health laboratories in Moldova lack awareness and information about why laboratory tests are important and how to identify them, which laboratories perform which tests, the prices of tests are not easy to find, especially difficulties for farmers.

Testing is often perceived as an unnecessary additional cost, as buyers are not sufficiently aware and appreciate the importance of conformity with food safety requirements. ANSA has started raising awareness of the importance of food safety and the specific requirements of the domestic and export markets (especially EU countries).

Business associations should also encourage and educate business partners more about the need for food safety and quality tests of products, which is the basis for ensuring food safety and protecting consumer interests.

It should also be noted that there is no clear and business-acceptable self-control sample logistics system, i.e. sample transportation from the company, farm to the laboratories.

Since the main laboratories are located in Chisinau, they are FBOs, farmers are forced to transport self-control samples 80-100 km to Chisinau and back, resulting in transportation costs that are already a burden, especially for small companies.

Although a laboratory infrastructure offers a wide range of laboratory services, FBOs insufficiently implement monitoring programs for milk quality indicators for various reasons: the test price and the lack of a logistics infrastructure for transporting samples to the laboratory.

Recommendation:

- Training/guidelines for FBOs on the importance of implementing self-control programs and the frequency of sampling (implementation of EU and national rules);
- Sufficient official control of self-control programs in the FBO;
- Creating a favourable business environment for the private sector:
  - subsidies for raw milk tests or other measures;
  - infrastructure for sampling and transporting samples to the laboratory from regions;
  - a transparent system about the offer of laboratory services on the website (indicator, method and price).

The expected result:

- Trained FBOs on the importance of self-control programs. Increased number of FBOs that have implemented the HACCP system, and certified food safety management systems according to ISO standards and other international standards, as well as increased number of companies that meet EU and national requirements;
- A more significant number of products and raw materials tested for microbiological indicators in the first stages of market supply allows for faster identification of unsafe products at an earlier stage before they are widely distributed, thus ensuring the safety of the country's consumers and their right to purchase only safe products;
- Sampling infrastructure created;

- More favourable conditions for the business to conduct tests, for example, when signing a more extended contract, more flexible conditions are applied. It is also essential to establish company/ farm-laboratory sampling routes;
- Inform FBOs about the nomenclature of laboratories and the services they offer.

Actors involved: ANSA, CRDV, Associations of animal breeders and producers/processors of food products, laboratories that provide laboratory services in the field of food and animal health analysis, donors, development projects.
Priority: High.

LEVERAGE POINT 7: Support programs in implementing quality standards and EU regulations

Description: The implementation of the EU requirements for FBOs from the entire meat, poultry and dairy products value chains imposes costs for additional investments in the context of meeting the new quality requirements, compiled with the EU requirements and national legislation.

MAFI is the authority for the development of the subsidy policies and AIPA is the authority for the implementation of subsidy policies in the agro-food sector including the production and processing sector of animal products (meat, poultry, and dairy products).

Current subsidy policies are aimed at:

- start-up development, which implies support from the moment of starting a business;
- post-investment subsidies - post-investment support in the amount of 50% of the total cost of investments for construction, reconstruction of farms and processing units, as well as equipping them with equipment;
- support for animal maintenance - direct payments per head of animal for cattle, sheep, and goats.

Encouraging and supporting investments in the value chains of meat, poultry, and dairy products through direct subsidy, post-investment subsidy, and start-up subsidy policies, especially for FBOs that implement quality standards is needed.

The new legislation of the EU, which entered into force on 1 January 2023, paves the way for a fairer, greener, and more performance-based Common Agriculture Policy, that is a partnership between society and agriculture and ensures a stable supply of food, safeguards farmers' income, protects the environment and keeps rural areas vibrant.

It seeks to ensure a sustainable future for farmers, provide more targeted support to smaller farms, and allow greater flexibility to adapt measures to local conditions.

Agriculture and rural areas are central to the European Green Deal, and the Common Agriculture Policy 2023-27 will be a key tool in reaching the ambitions of Farm-to Fork and biodiversity strategies.

The implementation of quality standards is important for the company in the context of implementation the EU requirements and for the consumer, thus we ensure safe products for human consumption

Recommendation:

- Promoting subsidy policies to increase investment in the production and processing sector. The continuity of the implementation of the existing subsidy policies in the field production and processing of animal products of meat, poultry, and dairy products;
- Development and promoting implementation of support programs for FBOs that implement quality standards. In additional to the existing subsidy policies, additional incentive programs should be implemented for FBOs that are in the process of implementation quality standards or have already implemented, as example by increasing the existing subsidies measures by 10% more.

The expected result:

- Increased number of FBOs on implementing quality standards (HACCP and ISO standards), complied with EU and national requirements. Increased the number of FBOs of the meat, poultry, and dairy value chain, that have implemented the HACCP system, and certified food safety management systems according to ISO standards and other international standards, as well as increased the number of companies that meet EU and national requirements.

Actors involved: MAFI, AIPA, Business Associations.
Priority: High.

LEVERAGE POINT 8: Involvement of Business Associations and FBOs in the negotiation process of the EU integration

Description: The Republic of Moldova applied for EU membership in March 2022 and was granted EU candidate country status in June 2022. In April 2023, the European Parliament requested that EU accession negotiations with the RM begin by the end of the year 2023. MEPs reaffirm their commitment to the future accession of the Republic of Moldova to the EU and want the negotiations with Chisinau to be launched before the end of the year. The EU and its member states should also increase their financial and technical assistance to the Republic of Moldova, according to MEPs, to facilitate its rapid and effective integration into the EU. This includes the rapid release of a new tranche of macro-financial assistance by the European Commission.

In this process, the participation of the business circles is important. For central public authorities such as MDED MAFI and ANSA that are involved in the negotiation process, to be with FBOs at each stage of the process, it is important FBOs to be consulted and informed.

Recommendation:

- Creation of sectoral working groups and interministerial committees with the active participation of FBOs;
- Informing and consulting FBOs about the negotiation process.

The expected result:

- Good result of the negotiations and the implementation of the accession requirements.

Actors involved: MDED, MAFI, ANSA, AIPA, CRDV, Business Associations.
Priority: High.

Annexes

Annex 1. List of interviews

#	Surname	First	Institution/Field of expertise	Date of interview
1.	Scripnic	Iurie	MAIA, State Secretary	13.09.2023
2.	Ceban	Cristina	MDED, State Secretary	22.08.2023
3.	Bejan	Viorica	MDED, Head of Department of Quality Infrastructure and Market Surveillance	21.09.2023
4.	Tarlev	Afanasie	ANSA, Deputy Director	04.08.2023
5.	Gherman	Diana	ANSA, Chief of Department International Relations and European Integration Department	04.08.2023
6.	Sirbu	Maxim	ANSA, Head of Department of Food Safety of Animal Origin Products	04.08.2023
7.	Bivol	Virginia	ANSA, Deputy head, Department of Food Safety of Animal Origin Products	04.08.2023
8.	Caraus	Vitalie	ANSA, Deputy head of the Department	13.09.2023
9.	Novac	Larisa	MOLDAC, Deputy Director	15.09.2023
10.	Mihaescu	Natalia	MOLDAC, Head of Department ACBIB	15.09.2023
11.	Sapoval	Natalia	MOLDAC, Head of Department Laboratory Accreditation	15.09.2023
12.	Curchi	Diana	CRDV, Head of the Food Safety Laboratory	23.08.2023, 21.09.2023
13.	Groza	Oxana	CRDV, Head of Animal Health Diagnostic Laboratory	21.09.2023
14.	Mocanu	Iurie	NBS, Deputy General Director	
15.	Cosalic	Diana	AIPA, Deputy Director	19.09.2023
16.	Salaru	Ion	ANSP, Deputy Director	20.09.2023
17.	Oxana	Burac	ANSP Laboratory (NASP), Head of the Microbiological Laboratory	20.09.2023
18.	Trili	Tatiana	Imunotechnomed SRL, Head of the department Food and Feed Diagnostic	21.09.2023
19.	Linte	Carolina	National Association of Milk and Dairy Products Producers “Milk”; Enterprise Patronage. Meat Processing Industry, Executive Director	18.08.2023
20.	Catlabuga	Ludmila	“Farmers - Milk Producers Association”, President of the Association	05.09.2023
21.	Ionescu	Aliona	Association of Pork Producers, Executive Director	19.09.2023
22.	Baltag	Grigore	National Federation of Sheep and Goat, Executive Director	19.09.2023
23.	Condur	Gheorghe	Public Association of Cattle, Sheep and Goat Breeders, Executive Director	22.09.2023
24.	Ciurea	Dorin	Union of Poultry Industry Producers, Executive Director	24.08.2023
25.	Cojocaru	Dumitrita	Employers’ Association of Poultry sector, President of the Association	21.08.2023
26.	Bulgaru	Stela	Floreni SA, poultry farm, Director	24.08.2023
27.	Baciu	Dorina	Salasul Baciului (milk processing family business), Founder and Administrator	22.09.2023
28	Cojocaru	Gheorghe	Axedum SRL (poultry farm), Founder and Owner	21.08.2023
29.	Gnatiuc	Lidia	Total Gnatiuc SRL (dairy farm), Owner	13.10.2023
30.	Papuc	Stefan	Seciprod SRL (dairy farm), Owner	13.10.2023
31.	Turcan	Andrei	GT Turcan Andrei (sheep farm), Owner	13.10.2023
32.	Nicu	Tudor	Stina Baciului SRL (sheep farm), Owner	14.10.2023

(continue)

#	Surname	First	Institution/Field of expertise	Date of interview
33.	Nicu	Denis	GT Nicu Denis (sheep farm), Owner	14.10.2023
34.	Sirbu	Tudor	SC Rom-Cris SRL (poultry farm), Owner	14.10.2023
35.	Primblas	Vadim	Impex Line SRL (poultry farm), Owner	15.10.2023
36.	Prisacaru	Viorel	Prisvio SRL (goat farm and milk processing unite), Owner	15.10.2023
37.	Luchian	Alexandru	GT Luchian Alexandru (dairy farm), Owner	15.10.2023
38.	Colesnic	Veaceslav	GT Colesnic Veaceslav (dairy farm), Owner	15.10.2023
39.	Vatamaniuc	Vasile	GT Vatamaniuc Vasile (dairy farm), Owner	16.10.2023
40.	Chisica	Roman	Prorovi Prim SRL (dairy farm), Owner	16.10.2023
41.	Ganea	Iurie	GT Ganea Iurie (dairy farm), Owner	17.10.2023
42.	Babara	Liubovi	Valea Sofiei SRL (dairy farm), Administrator	17.10.2023
43.	Scripcari	Ion	Lunca Vascaut SRL (dairy farm), Administrator	17.10.2023
44.	Pisarenco	Olga	GT Pisarenco Olga Gheorghe, Owner	18.10.2023
45.	Bitiu	Marian	Gifis-Farm SRL (milk processing unit and dairy farm), Administrator	18.10.2023
46.	Sevcisin	Vladimir	Sevcisin VS (dairy farm), Owner	18.10.2023
47.	Ceban	Dorel	Vealvit Agro SRL	18.10.2023

Source: Elaborated by the authors

Annex 2. Harmonization of national legislation with European Union legislation on the value chain of meat, poultry meat and dairy products

European Union legislation	National legislation
Regulation (EC) No 178/2002 of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety; **Implementing Regulation (EU) No 931/2011** of the European Commission regarding the traceability requirements for food of animal origin established in **Regulation (EC) No 178/2002** of the European Parliament and of the EU Council.	Law No 306/2018 on food safety.
R**egulation (EC) No 852/2004** of the European Parliament and of the Council on the hygiene of foodstuffs, **Regulation (EC) No 853/2004** of the European Parliament and of the Council establishing specific hygiene rules for foods of animal origin, **Regulation (EC) No 2074/2005**.	Law No 296/2017 regarding the general hygiene requirements of food products.
Regulation No 853/2004 establishing specific hygiene rules for food of animal origin.	Government Decision No 435/2010 regarding the approval of the Specific Hygiene Rules for food products of animal origin.
1) Regulation (EC) No 2073/2005 of the Commission on microbiological criteria for foodstuffs. **2) EC Regulation No 1441/2007** of the Commission amending **Regulation (EC) No 2073/2005** on microbiological criteria for foodstuffs.	Government Decision No 221/2009 regarding the approval of the Rules on microbiological criteria for food products.
Regulation (EU) No 1169/2011 of the European Parliament and of the Council on the provision of food information to consumers, amending **Regulations (EC) No 1924/2006** and **(EC) No 1925/2006** of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004.	Law No 279/2017 on the provision of food information to consumers
Regulation No 315/93 laying down Community procedures for contaminants in food. **Regulation No 1881/2006** setting maximum levels for certain contaminants in foodstuffs. **Council Directive 76/621/EEC** relating to the fixing of the maximum level of erucic acid in oils and fats intended as such for human consumption and in foodstuffs containing added oils or fats.	Government Decision No 520/2010 regarding the approval of the sanitary regulation regarding contaminants in food products
Regulation (EU) No 2016/429 of the European Parliament and the Council of the European Union on transmissible animal diseases and amending and repealing certain acts in the area of animal health ("Animal Health Law").	Government Decision No 605/2023 for the approval of the draft law on veterinary sanitary activity It is to be passed into law.
Regulation (EC) No 1333/2008 of the European Parliament and of the Council on food additives.	Government Decision No 229/2013 for the approval of the sanitary regulation on food additives

(continue)

European Union legislation	National legislation
Regulation (EC) No 1334/2008 of the European Parliament and of the Council on flavourings and certain food ingredients with flavouring properties for use in and on foods and amending **Council Regulation (EEC) No 1601/91, Regulations (EC) No 2232/96** and **(EC) No 110/2008** and Directive 2000/13/EC.	Government Decision No 1245/2018 regarding the approval of the sanitary regulations regarding flavourings and certain food ingredients with flavouring properties intended for use in and on food products and regarding smoke flavorings used or intended for use in or on food products.
Regulation (EC) No 1935/2004 of the European Parliament and of the Council on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC.	Government Decision No 308/2011 for the approval of the Sanitary Regulation regarding materials and objects intended to come into contact with food products.
Regulation (EC) No 2023/2006 of the Commission on good manufacturing practice for materials and articles intended to come into contact with food.	Government Decision No 594/2014 for the approval of the sanitary regulation regarding the good manufacturing practice of materials and objects intended to come into contact with food products.
Regulation (EU) No 10/2011 of the Commission on plastic materials and articles intended to come into contact with food.	Government Decision No 278/2013 for the approval of the Sanitary Regulation regarding plastic materials and objects intended to come into contact with food products.
Regulation (EU) No 2017/625 regarding official controls and other official activities performed to ensure the application of food and feed law, rules on animal health and welfare, plant health and plant protection products.	The draft of the Government Decision on the approval of the draft law on official controls in the agri-food sector (unique number 601/MAIA/2023), which is in the process of being approved, has been developed.
Commission Implementing Regulation (EU) No 2019/627 of 15 March 2019 laying down uniform practical arrangements for the performance of official controls on products of animal origin intended for human consumption in accordance with Regulation (EU) 2017/625 of the European Parliament and of the Council and amending Commission Regulation (EC) No 2074/2005 as regards official controls.	There is no transposed into national legislation. It needs to review the draft of the Government Decision on the approval of the draft law on official controls in the agri-food sector (unique number 601/MAIA/2023) and assess the implementation of Regulation (EU) No 219/627.
Council Decision on the marketing and administration of bovine somatotropin (STB) and repealing Decision 90/218/EEC. Commission **Regulation (EC) No 543/2008** laying down detailed rules for the application of Council **Regulation (EC) No 1234/2007** as regards the marketing standards for poultry meat.	Government Decision No 1034/2016 for the modification and completion of some Government decisions.
Regulation (EC) No 589/2008 of the Commission laying down detailed rules for implementing Council **Regulation (EC) No 1234/2007** as regards marketing standards for eggs. **Regulation (EC) No 1234/2007** of the Council establishing a common organization of agricultural markets and on specific provisions for certain agricultural products.	Government Decision No 746/2011 regarding the amendment and completion of the sanitary-veterinary norm regarding the marketing of eggs for human consumption, approved by Government Decision No 1208/2008

(continue)

European Union legislation	National legislation
Regulation (EU) No 1308/2013 of the European Parliament and of the Council establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007.	GD No 198/2017 for the amendment and completion of Government Decision No 929/2009. GD No 296/2011 regarding the approval of amendments and additions to some Government decisions (transposes art. 118 and annex No XVI to Regulation (EC) No 1234/2007). GD No 1208/2008 regarding the approval of the Sanitary-Veterinary Norm regarding the marketing of eggs for human consumption. Law No 27/2017 regarding the classification of cattle, pig and sheep carcasses (transposes Annex IV to Regulation (EU) No 1308/2013). GD No 158/2019 regarding the approval of the Quality Requirements for milk and dairy products. Government Decision No 1406/2008 for the approval of the Sanitary-Veterinary Norm regarding the classification and labelling system of beef and beef products.
Regulation (EC) No 396/2005 of the European Parliament and of the Council on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC.	Government Decision No 1191 regarding the approval of the Sanitary Regulation regarding the maximum allowed limits of residues of phytosanitary products in or on food products and food of vegetable and animal origin for animals.
Regulation (EU) No 37/2010 of the Commission on pharmacologically active substances and their classification regarding the maximum residue limits in foodstuffs of animal origin.	Order No 5/2021 regarding the approval of the list of pharmacologically active substances and their classification according to the maximum residual limits in food products of animal origin.

Source: Elaborated by the authors, based on MAFI data

The last version of EU Regulation (EC) No 396/2005[77] related to value chain products for pesticides is not transposed into the national legislation.

Commission Directive 2002/63/EC of 11 July 2002 establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin and repealing Directive 79/700/EEC. ANSA has developed the standard operation procedure of sampling for animal-origin products (tissues) in slaughterhouses. The harmonisation of this directive was not assessed.

EU Regulations related to residue are not transposed into the national legislation as follows:

- **Regulation (EU) 2022/1644**[78]
- **Regulation (EU) 2022/1646**[79]
- **Regulation (EU) 2021/808**[80]
- **Regulation (EU) 2022/2292**[81]
- **Regulation (EU) 2022/2293**[82].

EU Regulation 915/2023[83] related to value chain products on maximum levels for certain contaminants in food is not transposed into the national legislation.

77. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32005R0396
78. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R1644
79. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R1646
80. https://eur-lex.europa.eu/eli/reg_impl/2021/808/oj
81. https://eur-lex.europa.eu/eli/reg_del/2022/2292/oj
82. https://eur-lex.europa.eu/eli/reg_impl/2022/2293
83. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R0915

Annex 3. Microbiological criteria for meat, poultry meat and milk value chain products

The latest version of Commission **Regulation (EC) No 2073/2005** on microbiological criteria for foodstuffs[84] lays down the microbiological criteria for meat, poultry meat and dairy products, the implementing rules to be completed by FBOs when implementing the general and specific hygiene measures referred to in Article 4 of Regulation (EC) No. 852/2004.

The main definitions are as follows:

> **'Food safety criterion'** means a criterion defining the acceptability of a product or a batch of foodstuff applicable to products placed on the market;
>
> **'Process hygiene criterion'** is a criterion indicating the acceptable functioning of the production process. Such a criterion is not applicable to products placed on the market. It sets an indicative contamination value above which corrective actions are required in order to maintain the hygiene of the process in compliance with food law.

FBOs shall perform testing as appropriate against the microbiological criteria set out in Annex I when they are validating or verifying the correct functioning of their procedures based on HACCP principles and good hygiene practices. FBOs shall decide the appropriate sampling frequencies, except where Annex I provide for specific sampling frequencies, in which case the sampling frequency shall be at least provided for in Annex I. FBOs shall make this decision in the context of their procedures based on HACCP principles and good hygiene practice, taking into account the instructions for the use of the foodstuff. The frequency of sampling may be adapted to the nature and size of the food businesses, provided that the safety of foodstuffs will not be endangered.

Food safety criteria of meat and meat products:

Food category	Micro-organisms / their toxins, metabolites	Sampling plan		Limits		Analytical reference method	Current situation in RM
		n	c	m	M		
1.2 Ready-to-eat foods able to support the growth of L. monocytogenes, other than those intended for infants and for special medical purposes	*Listeria monocytogenes*	5	0	100 cfu		EN/ISO 11290-2	EN/ISO 11290-2
		5	0	Not detected in 25 g		EN/ISO 11290-1	EN/ISO 11290-1
1.4 Minced meat and meat preparations intended to be eaten raw	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.5 Minced meat and meat preparations made from poultry meat intended to be eaten cooked	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.6 Minced meat and meat preparations made from other species than poultry intended to be eaten cooked	*Salmonella*	5	0	Not detected in 10 g		EN ISO 6579-1	EN ISO 6579-1
1.7 Mechanically separated meat (MSM)	*Salmonella*	5	0	Not detected in 10 g		EN ISO 6579-1	EN ISO 6579-1
1.8 Meat products intended to be eaten raw, excluding products where the manufacturing process or the composition of the product will eliminate the salmonella risk	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.9 Meat products made from poultry meat intended to be eaten cooked	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1

Source: Elaborated by the authors according to Commission Regulation (EC) No 2073/2005

84. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32005R2073

Process hygiene criteria of meat and meat products:

Food category	Micro-organisms	Sampling plan		Limits		Analytical reference method	Current situation in RM
		n	c	m	M		
2.1.1 Carcases of cattle, sheep, goats	Aerobic colony count			3,5 log cfu/ cm^2 daily mean log	5,0 log cfu/ cm^2 daily mean log	EN ISO 4833-1	EN ISO 4833-1
	Enterobacteriaceae			1,5 log cfu/ cm^2 daily mean log	2,5 log cfu/ cm^2 daily mean log	EN ISO 21528-2	EN ISO 21528-2
2.1.2 Carcases of pigs	Aerobic colony count			4,0 log cfu/ cm^2 daily mean log	5,0 log cfu/ cm^2 daily mean log	EN ISO 4833-1	EN ISO 4833-1
	Enterobacteriaceae			2,0 log cfu/ cm^2 daily mean log	3,0 log cfu/ cm^2 daily mean log	EN ISO 21528-2	EN ISO 21528-2
2.1.3 Carcases of cattle, sheep, goats and horses	*Salmonella*	50	2	Not detected in the area tested per carcase	EN ISO 6579-1	EN ISO 6579-1	
2.1.4 Carcases of pigs	*Salmonella*	50	3	Not detected in the area tested per carcase	EN ISO 6579-1	EN ISO 6579-1	
2.1.6 Minced meat	Aerobic colony count	5	2	5 × 105cfu/g	5 × 106cfu/g	EN ISO 4833-1	EN ISO 4833-1
	E. coli	5	2	50 cfu/g	500 cfu/g	ISO 16649-1 or 2	ISO 16649-2
2.1.7 Mechanically separated meat (MSM)	Aerobic colony count	5	2	5 × 105cfu/g	5 × 10^6cfu/g	EN ISO 4833-1	EN ISO 4833-1
	E. coli	5	2	50 cfu/g	500 cfu/g	ISO 16649-1 or 2	ISO 16649-2
2.1.8 Meat preparations	*E. coli*	5	2	500 cfu/g or cm^2	5 000 cfu/g or cm^2	ISO 16649-1 or 2	ISO 16649-2

Source: Elaborated by the authors according to Commission Regulation (EC) No 2073/2005

Food safety criteria of poultry (egg) products:

Food category	Micro-organisms/ their toxins, metabolites	Sampling plan		Limits		Analytical reference method	Current situation in RM
		n	c	m	M		
1.14 Egg products, excluding products where the manufacturing process or the composition of the product will eliminate the salmonella risk	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.15 Ready-to-eat foods containing raw egg, excluding products where the manufacturing process or the composition of the product will eliminate the salmonella risk	*Salmonella*	5	0	Not detected in 25 g or ml		EN ISO 6579-1	EN ISO 6579-1

Source: Elaborated by authors according to Commission Regulation (EC) No 2073/2005

Process hygiene criteria of poultry products:

Food category	Micro-organisms/their toxins, metabolites	Sampling plan		Limits		Analytical reference method	Current situation in RM
		n	c	m	M		
2.1.5 Poultry carcases of broilers and turkeys	*Salmonella spp.*	50	7 ([85]) From 1.1.2012 c = 5 for broilers From 1.1.2013 c = 5 for turkeys	Not detected in 25 g of a pooled sample of neck skin		EN ISO 6579-1	EN ISO 6579-1
2.1.9 Carcasses of broilers	*Campylobacter spp.*	50	c = 20 From 1.1.2020 c = 15; From 1.1.2025 c = 10	1 000 cfu/g		EN ISO 10272-2	ISO 10272-2

Source: Elaborated by authors according to Commission Regulation (EC) No 2073/2005

Process hygiene criteria of egg products:

Food category	Micro-organisms	Sampling plan		Limits		Analytical reference method (4)	Current situation in RM
		n	c	m	M		
2.3.1 Egg products	Enterobacteriaceae	5	2	10 cfu/g or ml	100 cfu/g or ml	EN ISO 21528-2	EN ISO 21528-2

Source: Elaborated by the authors according to Commission Regulation (EC) No 2073/2005

85. 1 ml of inoculum is plated on a Petri dish of 140 mm diameter or on three Petri dishes of 90 mm diameter.

Food safety criteria of dairy products:

Food category	Micro-organisms / their toxins, metabolites	Sam-pling plan		Limits		Analy-tical refe-rence method	Current situation in RM
		n	c	m	M		
1.2 Ready-to-eat foods able to support the growth of L. monocytogenes, other than those intended for infants and for special medical purposes	*Listeria monocytogenes*	5	0	100 cfu/g		EN/ISO 11290-2	EN/ISO 11290-2
		5	0	Not detected in 25 g		EN/ISO 11290-1	EN/ISO 11290-2
1.11 Cheeses, butter and cream made from raw milk or milk that has undergone a lower heat treatment than pasteurisation	*Salmonella*	5	0	Not detect-ed in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.12 Milk powder and whey powder	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.13 Ice cream, excluding products where the manufacturing process or the com-position of the product will eliminate the salmonella risk	*Salmonella*	5	0	Not detected in 25 g		EN ISO 6579-1	EN ISO 6579-1
1.21 Cheeses, milk powder and whey pow-der, as referred to in the coagulase-positive staphylococci criteria in Chapter 2.2 of this Annex	*Staphylococcal enterotoxins*	5	0	Not detected in 25 g		EN ISO 19020	

Source: Elaborated by the authors according to Commission Regulation (EC) No 2073/2005

Process hygiene criteria of dairy products:

Food category	Micro-organisms	Sampling plan		Limits		Analytical reference method (4)	Current situation in RM
		n	c	m	M		
2.2.1 Pasteurised milk and other pasteurised liquid dairy products	Enterobacteriaceae	5	0	10 cfu/ml		EN ISO 21528-2	EN ISO 21528-2
2.2.2 Cheeses made from milk or whey that has undergone heat treatment	*E. coli*	5	2	100 cfu/g	1 000 cfu/g	ISO 16649-1 or 2	ISO 16649-2
2.2.3 Cheeses made from raw milk	Coagulase-positive staphylococci	5	2	10^4 cfu/g	10^5 cfu/g	EN/ISO 6888-2	EN/ISO 6888-2
2.2.4 Cheeses made from milk that has undergone a lower heat treatment than pasteurisation and ripened cheeses made from milk or whey that has undergone pasteurisation or a stronger heat treatment	Coagulase-positive staphylococci	5	2	100 cfu/g	1 000 cfu/g	EN/ISO 6888-1 or 2	EN/ISO 6888-1
2.2.5 Unripened soft cheeses (fresh cheeses) made from milk or whey that has undergone pasteurisation or a stronger heat treatment	Coagulase-positive staphylococci	5	2	10 cfu/g	100 cfu/g	EN/ISO 6888-1 or 2	EN/ISO 6888-1
2.2.6 Butter and cream made from raw milk or milk that has undergone a lower heat treatment than pasteurisation	*E. coli*	5	2	10 cfu/g	100 cfu/g	ISO 16649-1 or 2	ISO 16649-2
2.2.8 Ice cream and frozen dairy desserts	Enterobacteriaceae	5	2	10 cfu/g	100 cfu/g	EN ISO 21528-2	EN ISO 21528-2

Source: Elaborated by authors according to Commission Regulation (EC) No 2073/2005

Interpretation of the test results should be assessed according to provisions given in the latest version of Regulation (EC) No 2073/2005.

FBOs and the competent authority must take samples for carcasses of cattle, pigs, sheep, goats according to provisions given in the latest version of Regulation (EC) No 2073/2005.

FBOs and the competent authority must take samples for carcasses of poultry and fresh poultry meat for Salmonella and Campylobacter analyses according to provisions given in the latest version of Regulation (EC) No 2073/2005.

Annex 4. Production of main animal products, by categories of producers

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All categories of producers											
Livestock for slaughter (in live weight), thou. Tonnes of which:	**156.0**	**154.8**	**164.0**	**174.5**	**184.3**	**157.8**	**163.3**	**158.6**	**159.2**	**147.5**	**160.5**
Bovine / Cattle	15.8	13.8	13.7	14.0	15.8	12.7	13.4	12.7	13.8	12.6	16.7
Pigs / Swine	82.2	77.8	82.3	91.6	92.9	79.2	84.0	82.7	80.9	77.5	81.2
Sheep and goats	4.7	4.4	4.2	4.4	4.2	5.1	4.1	4.2	3.5	3.1	2.0
Poultry	51.7	57.3	62.2	62.7	69.9	59.3	60.3	57.6	60.6	53.3	59.6
Other animals	1.6	1.5	1.6	1.7	1.7	1.7	1.5	1.4	0.4	1.0	1.0
Cow's milk, thou. tonnes	**489.6**	**485.9**	**485.3**	**479.5**	**462.1**	**442.6**	**373.1**	**331.7**	**290.5**	**264.9**	**240.4**
Eggs, mio. pcs.	**621.9**	**623.7**	**645.0**	**628.8**	**673.5**	**707.2**	**688.7**	**686.6**	**627.5**	**578.4**	**593.0**
Agricultural enterprises and Farms											
Livestock for slaughter (in live weight), thou. Tonnes of which:	**43.8**	**53.8**	**58.2**	**70.4**	**76.0**	**76.9**	**83.7**	**85.7**	**95.5**	**89.5**	**99.2**
Bovine / Cattle	2.2	1.9	1.4	2.6	4.6	5.3	5.3	5.4	6.3	5.8	11.5
Pigs / Swine	18.3	23.4	25.9	32.6	33.2	27.5	33.1	36.6	46.0	46.3	42.7
Sheep and goats	0.4	0.3	0.2	0.4	0.3	0.9	0.2	0.5	0.2	2.3	0.2
Poultry	22.9	28.2	30.7	34.7	38.1	43.1	45.0	43.1	42.9	37.2	44.8
Other animals	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0
Cow's milk, thou. tonnes	**15.6**	**15.8**	**21.3**	**22.5**	**24.7**	**24.2**	**21.8**	**23.5**	**23.0**	**27.8**	**36.9**
Eggs, mio. pcs.	**242.2**	**242.0**	**246.5**	**292.6**	**292.7**	**316.2**	**318.0**	**297.7**	**253.5**	**238.0**	**256.3**
Households											
Livestock for slaughter (in live weight), thou. Tonnes of which:	**112.2**	**101.0**	**105.8**	**104.1**	**108.3**	**80.9**	**79.6**	**72.9**	**63.6**	**58.0**	**61.3**
Bovine / Cattle	13.6	11.9	12.3	11.4	11.3	7.4	8.1	7.3	6.8	6.8	5.2
Pigs / Swine	63.9	54.4	56.4	92.6	59.6	51.7	50.9	46.1	47.8	31.2	38.5
Sheep and goats	4.3	4.1	4.0	4.0	4.0	4.2	3.9	3.7	3.9	0.8	1.8
Poultry	28.8	29.1	31.5	28.0	31.8	16.2	15.3	14.5	17.7	16.1	14.8
Other animals	1.6	1.5	1.6	1.7	1.6	1.6	1.4	1.2	0.3	0.9	1.0
Cow's milk, thou. tonnes	**474.0**	**470.1**	**464.0**	**457.0**	**437.4**	**418.4**	**351.3**	**308.2**	**267.5**	**237.1**	**203.5**
Eggs, mio. pcs.	**379.7**	**381.7**	**398.5**	**380.9**	**380.9**	**391.0**	**370.7**	**388.9**	**374.0**	**340.4**	**336.7**

Source: NBS

Annex 5. Number of enterprises, total

Statistical Classification of Economic Activities (NACE Rev. 2.1)	2014	2015	2016	2017	2018	2019	2020	2021	2022
A AGRICULTURE, FORESTRY AND FISHING	**3,057**	**3,168**	**3,439**	**3,847**	**4,210**	**4,428**	**4,681**	**5,077**	**5,454**
01 Crop and animal production, hunting and related service activities	**2,921**	**3,031**	**3,318**	**3,723**	**4,086**	**4,300**	**4,544**	**4,946**	**5,315**
01.4 Animal production	**330**	**347**	**368**	**395**	**429**	**452**	**513**	**583**	**638**
01.41 Raising of dairy cattle	43	47	48	54	56	64	74	97	108
01.42 Raising of other cattle and buffaloes	12	11	12	13	15	12	10	13	16
01.45 Raising of sheep and goats	16	19	21	17	20	20	27	26	35
01.46 Raising of swine and pigs	54	54	59	57	55	55	54	58	49
01.47 Raising of poultry	130	139	138	135	143	139	132	132	138
01.49 Raising of other animals	73	75	89	118	139	161	214	256	291
10 Manufacture of food products	**964**	**932**	**935**	**949**	**993**	**984**	**1,004**	**977**	**980**
10.1 Processing and preserving of meat and production of meat products	**121**	**118**	**111**	**103**	**114**	**123**	**127**	**121**	**126**
10.11 Processing and preserving of meat, except of poultry meat	52	53	47	45	50	53	58	57	60
10.12 Processing and preserving of poultry meat	5	5	3	6	7	7	8	9	11
10.13 Production of meat and poultry meat products	64	60	61	52	57	63	61	55	55
10.4 Manufacture of vegetable and animal oils and fats	**75**	**77**	**70**	**75**	**80**	**71**	**77**	**76**	**70**
10.41 Manufacture of oils and fats	71	72	65	71	76	68	75	74	68
10.42 Manufacture of margarine and similar edible fats	4	5	5	4	4	3	2	2	2
10.5 Manufacture of dairy products and edible ice	**32**	**34**	**36**	**36**	**35**	**33**	**38**	**34**	**36**
10.51 Manufacture of dairy products	22	24	27	28	27	24	28	24	28
10.52 Manufacture of ice cream and other edible ice	10	10	9	8	8	9	10	10	8
10.8 Manufacture of other food products	**76**	**66**	**68**	**72**	**78**	**79**	**78**	**81**	**86**
10.85 Manufacture of prepared meals and dishes	18	18	19	18	21	18	16	13	14
10.86 Manufacture of homogenised food preparations and dietetic food	2	1	0	1	1	1	3	1	3
10.89 Manufacture of other food products n.e.c.	28	21	19	18	17	13	14	16	18
10.9 Manufacture of prepared animal feeds	**7**	**9**	**11**	**13**	**16**	**17**	**21**	**26**	**30**
10.91 Manufacture of prepared feeds for farm animals	6	8	9	10	12	13	17	23	26
28.30 Manufacture of agricultural and forestry machinery	13	16	17	15	18	17	22	16	15
28.93 Manufacture of machinery for food, beverage and tobacco processing	3	3	2	6	5	8	9	8	6
46 Wholesale trade	**7,805**	**7,623**	**7,766**	**7,846**	**7,926**	**7,537**	**7,357**	**7,275**	**7,276**
46.3 Wholesale of food, beverages and tobacco	1,441	1,426	1,449	1,501	1,487	1,439	1,404	1,411	1,363
46.32 Wholesale of meat and meat products	127	120	119	127	123	119	110	112	110
46.33 Wholesale of dairy products, eggs and edible oils and fats	77	68	75	78	76	72	71	77	68
46.61 Wholesale of agricultural machinery, equipment and supplies	110	120	118	125	135	136	145	150	151
47 Retail trade	**11,010**	**10,770**	**10,805**	**10,993**	**11,111**	**10,865**	**11,129**	**11,487**	**11,573**
47.2 Retail sale of food, beverages and tobacco	860	860	896	921	968	948	987	1,018	1,041
47.22 Retail sale of meat and meat products (in specialized stores)	96	109	111	114	127	124	115	122	130
47.29 Retail sale of other food products (in specialized stores)	183	193	205	219	238	237	268	271	274

Source: NBS

Annex 6. Number of active enterprises (with a turnover greater than zero)

Statistical Classification of Economic Activities (NACE Rev. 2.1)	2014	2015	2016	2017	2018	2019	2020	2021	2022
A AGRICULTURE, FORESTRY AND FISHING	**2,309**	**2,372**	**2,598**	**2,966**	**3,247**	**3,510**	**3,643**	**4,020**	**4,371**
01 Crop and animal production, hunting and related service activities	**2,225**	**2,293**	**2,521**	**2,885**	**3,169**	**3,430**	**3,562**	**3,936**	**4,280**
01.4 Animal production	**208**	**217**	**223**	**249**	**265**	**292**	**312**	**355**	**423**
01.41 Raising of dairy cattle	28	35	35	42	43	48	53	72	82
01.42 Raising of other cattle and buffaloes	5	4	3	4	5	4	4	6	12
01.45 Raising of sheep and goats	8	9	10	12	11	13	19	21	25
01.46 Raising of swine and pigs	31	33	31	36	34	34	30	36	34
01.47 Raising of poultry	97	103	107	105	105	103	97	98	101
01.49 Raising of other animals	38	32	36	49	66	89	107	121	168
10 Manufacture of food products	710	705	696	699	720	714	707	710	715
10.1 Processing and preserving of meat and production of meat products	**87**	**90**	**80**	**76**	**82**	**90**	**93**	**88**	**90**
10.11 Processing and preserving of meat, except of poultry meat	37	39	33	31	34	38	40	38	38
10.12 Processing and preserving of poultry meat	4	4	3	6	7	6	8	8	10
10.13 Production of meat and poultry meat products	46	47	44	39	41	46	45	42	42
10.4 Manufacture of vegetable and animal oils and fats	**56**	**52**	**49**	**52**	**56**	**46**	**57**	**55**	**52**
10.41 Manufacture of oils and fats	54	49	46	50	54	45	56	54	51
10.42 Manufacture of margarine and similar edible fats	2	3	3	2	2	1	1	1	1
10.5 Manufacture of dairy products and edible ice	**24**	**22**	**26**	**26**	**27**	**25**	**26**	**27**	**24**
10.51 Manufacture of dairy products	17	15	19	20	22	19	20	20	19
10.52 Manufacture of ice cream and other edible ice	7	7	7	6	5	6	6	7	5
10.8 Manufacture of other food products	**47**	**48**	**49**	**52**	**58**	**58**	**53**	**56**	**60**
10.85 Manufacture of prepared meals and dishes	9	14	14	13	17	13	11	9	8
10.86 Manufacture of homogenised food preparations and dietetic food	1	0	0	1	1	1	2	0	2
10.89 Manufacture of other food products n.e.c.	18	14	14	11	11	7	6	7	10
10.9 Manufacture of prepared animal feeds	**7**	**8**	**10**	**9**	**13**	**15**	**14**	**19**	**23**
10.91 Manufacture of prepared feeds for farm animals	6	7	8	7	9	11	11	17	19
28.30 Manufacture of agricultural and forestry machinery	12	16	17	15	15	13	17	14	14
28.93 Manufacture of machinery for food, beverage and tobacco processing	3	3	2	6	5	8	9	8	6
46 Wholesale trade	**4,975**	**4,841**	**4,963**	**5,072**	**5,112**	**5,022**	**4,920**	**4,933**	**4,957**
46.3 Wholesale of food, beverages and tobacco	882	872	898	959	955	940	933	944	919
46.32 Wholesale of meat and meat products	86	89	87	93	87	76	71	74	76
46.33 Wholesale of dairy products, eggs and edible oils and fats	52	50	55	55	52	56	56	56	48
46.61 Wholesale of agricultural machinery, equipment and supplies	90	92	89	99	103	105	113	120	116
47 Retail trade	**8,397**	**8,309**	**8,253**	**8,379**	**8,561**	**8,493**	**8,731**	**9,103**	**9,232**
47.2 Retail sale of food, beverages and tobacco	605	621	640	664	711	695	734	764	776
47.22 Retail sale of meat and meat products (in specialized stores)	66	84	86	89	94	92	85	95	107
47.29 Retail sale of other food products (in specialized stores)	137	150	160	167	183	179	213	215	216

Source: NBS

Annex 7. Number of employees, people

Statistical Classification of Economic Activities (NACE Rev. 2.1)	2014	2015	2016	2017	2018	2019	2020	2021	2022
A AGRICULTURE, FORESTRY AND FISHING	**47,068**	**46,353**	**46,602**	**45,447**	**45,214**	**43,523**	**40,402**	**40,159**	**39,697**
01 Crop and animal production, hunting and related service activities	**42,852**	**42,233**	**42,519**	**41,404**	**41,255**	**39,562**	**36,420**	**36,573**	**35,955**
01.4 Animal production	**3,786**	**4,494**	**4,163**	**3,210**	**3,283**	**3,480**	**3,327**	**3,376**	**3,355**
01.41 Raising of dairy cattle	294	319	287	300	334	343	364	389	458
01.42 Raising of other cattle and buffaloes	20	21	26	59	55	56	64	88	121
01.45 Raising of sheep and goats	30	60	38	38	43	49	67	65	66
01.46 Raising of swine and pigs	735	1,178	981	955	911	953	937	916	801
01.47 Raising of poultry	2,545	2,757	2,662	1,644	1,702	1,799	1,677	1,674	1,621
01.49 Raising of other animals	150	150	162	205	229	271	208	235	279
10 Manufacture of food products	25,013	24,535	24,718	27,051	27,097	26,914	26,608	25,475	24,816
10.1 Processing and preserving of meat and production of meat products	**3,813**	**3,660**	**3,645**	**5,315**	**5,549**	**5,498**	**5,882**	**5,546**	**5,507**
10.11 Processing and preserving of meat, except of poultry meat	1,188	1,325	1,073	391	474	498	656	617	588
10.12 Processing and preserving of poultry meat	345	50	54	1,311	1,446	1,355	1,546	1,115	1,027
10.13 Production of meat and poultry meat products	2,280	2,285	2,518	3,613	3,629	3,645	3,680	3,814	3,892
10.4 Manufacture of vegetable and animal oils and fats	**1,107**	**1,089**	**1,011**	**1,003**	**1,085**	**975**	**1,125**	**1,118**	**1,246**
10.41 Manufacture of oils and fats	1,081	1,057	974	975	1,049	949	1,089	1,092	1,222
10.42 Manufacture of margarine and similar edible fats	26	32	37	28	36	26	36	26	24
10.5 Manufacture of dairy products and edible ice	**3,879**	**3,961**	**4,001**	**4,065**	**3,953**	**4,173**	**4,123**	**3,865**	**3,452**
10.51 Manufacture of dairy products	3,326	3,437	3,470	3,534	3,438	3,674	3,669	3,528	3,131
10.52 Manufacture of ice cream and other edible ice	553	524	531	531	515	499	454	337	321
10.8 Manufacture of other food products	**3,146**	**2,706**	**2,635**	**2,650**	**2,560**	**2,523**	**2,257**	**2,116**	**2,199**
10.85 Manufacture of prepared meals and dishes	206	208	234	303	297	267	236	195	156
10.86 Manufacture of homogenised food preparations and dietetic food	2	1	0	30	24	27	24	0	24
10.89 Manufacture of other food products n.e.c.	335	294	105	65	45	40	38	33	111
10.9 Manufacture of prepared animal feeds	**199**	**161**	**168**	**158**	**197**	**276**	**263**	**243**	**225**
10.91 Manufacture of prepared feeds for farm animals	198	160	166	155	183	254	253	238	218
28.30 Manufacture of agricultural and forestry machinery	453	445	422	352	336	295	306	292	261
28.93 Manufacture of machinery for food, beverage and tobacco processing	28	40	34	115	122	155	125	96	50
46 Wholesale trade	**43,671**	**44,946**	**45,971**	**48,311**	**49,857**	**49,730**	**47,399**	**48,342**	**47,926**
46.3 Wholesale of food, beverages and tobacco	11,924	12,046	12,413	13,660	14,243	14,773	13,921	13,875	13,778
46.32 Wholesale of meat and meat products	694	854	794	940	1,044	808	678	764	847
46.33 Wholesale of dairy products, eggs and edible oils and fats	622	675	688	713	785	838	904	939	922
46.61 Wholesale of agricultural machinery, equipment and supplies	1,032	1,040	1,017	1,155	1,234	1,252	1,363	1,306	1,332
47 Retail trade	**60,403**	**60,520**	**61,267**	**62,584**	**63,268**	**65,960**	**64,543**	**66,873**	**65,087**
47.2 Retail sale of food, beverages and tobacco	3,827	3,744	3,534	3,481	3,578	3,641	3,384	3,482	2,951
47.22 Retail sale of meat and meat products (in specialized stores)	277	324	339	369	443	528	562	546	561
47.29 Retail sale of other food products (in specialized stores)	856	907	976	1,006	1,104	1,051	1,203	1,098	918

Source: NBS

Annex 8. Total turnover, mil. MDL

Statistical Classification of Economic Activities (NACE Rev. 2.1)	2014	2015	2016	2017	2018	2019	2020	2021	2022
A AGRICULTURE, FORESTRY AND FISHING	**10,749**	**11,836**	**14,421**	**15,984**	**17,216**	**17,502**	**15,974**	**24,713**	**27,900**
01 Crop and animal production, hunting and related service activities	**10,468**	**11,495**	**14,084**	**15,613**	**16,826**	**17,077**	**15,587**	**24,228**	**27,328**
01.4 Animal production	**2,135**	**2,366**	**2,578**	**2,007**	**2,067**	**2,416**	**2,473**	**2,878**	**3,801**
01.41 Raising of dairy cattle	103	139	108	126	141	156	178	193	283
01.42 Raising of other cattle and buffaloes	3	3	34	52	69	62	67	92	156
01.45 Raising of sheep and goats	4	7	6	21	10	10	14	23	20
01.46 Raising of swine and pigs	698	778	905	895	987	1,196	1,254	1,443	1,697
01.47 Raising of poultry	1,327	1,439	1,526	913	859	992	961	1,127	1,645
01.49 Raising of other animals	31	39	44	66	80	106	103	134	218
10 Manufacture of food products	14,095	15,294	16,639	17,912	18,427	19,533	20,155	23,406	36,419
10.1 Processing and preserving of meat and production of meat products	**2,916**	**2,584**	**2,729**	**3,934**	**4,392**	**4,751**	**4,880**	**5,676**	**7,082**
10.11 Processing and preserving of meat, except of poultry meat	1,541	1,307	1,224	572	699	767	908	990	1,017
10.12 Processing and preserving of poultry meat	228	53	61	891	990	888	800	854	1,195
10.13 Production of meat and poultry meat products	1,148	1,225	1,444	2,471	2,703	3,096	3,172	3,832	4,870
10.4 Manufacture of vegetable and animal oils and fats	**1,041**	**1,679**	**2,187**	**1,624**	**2,317**	**2,662**	**3,109**	**3,834**	**11,823**
10.41 Manufacture of oils and fats	1,023	1,661	2,170	1,608	2,294	2,640	3,082	3,808	11,793
10.42 Manufacture of margarine and similar edible fats	17	17	17	16	23	22	27	26	30
10.5 Manufacture of dairy products and edible ice	**2,607**	**2,823**	**3,066**	**3,204**	**3,070**	**3,155**	**3,222**	**3,484**	**4,089**
10.51 Manufacture of dairy products	2,419	2,595	2,821	2,930	2,781	2,886	3,010	3,237	3,714
10.52 Manufacture of ice cream and other edible ice	188	228	245	275	288	269	212	246	375
10.8 Manufacture of other food products	**2,819**	**2,892**	**2,853**	**2,588**	**2,166**	**1,840**	**1,976**	**2,358**	**2,912**
10.85 Manufacture of prepared meals and dishes	47	56	78	75	111	108	108	109	139
10.86 Manufacture of homogenised food preparations and dietetic food	0	0	0	14	13	14	12	0	11
10.89 Manufacture of other food products n.e.c.	423	494	84	11	12	12	25	10	28
10.9 Manufacture of prepared animal feeds	**79**	**65**	**73**	**71**	**106**	**169**	**193**	**241**	**271**
10.91 Manufacture of prepared feeds for farm animals	79	65	73	70	98	161	192	241	271
28.30 Manufacture of agricultural and forestry machinery	193	136	164	117	128	100	122	150	123
28.93 Manufacture of machinery for food, beverage and tobacco processing	4	5	5	18	18	51	20	27	11
46 Wholesale trade	**77,720**	**80,927**	**87,803**	**98,574**	**106,739**	**121,627**	**114,864**	**149,401**	**182,907**
46.3 Wholesale of food, beverages and tobacco	21,608	22,768	21,957	25,709	27,067	30,958	30,544	35,206	42,125
46.32 Wholesale of meat and meat products	1,255	1,427	1,350	1,672	1,585	1,850	1,508	1,961	2,350
46.33 Wholesale of dairy products, eggs and edible oils and fats	3,458	4,208	1,394	1,215	1,372	1,435	1,481	1,818	2,380
46.61 Wholesale of agricultural machinery, equipment and supplies	2,074	1,555	1,796	2,351	2,639	2,638	2,537	3,961	4,768
47 Retail trade	**40,591**	**40,792**	**42,626**	**47,372**	**52,008**	**59,071**	**59,333**	**73,642**	**91,518**
47.2 Retail sale of food, beverages and tobacco	**1,842**	**1,531**	**1,988**	**2,035**	**2,264**	**2,242**	**2,180**	**2,708**	**2,783**
47.22 Retail sale of meat and meat products (in specialized stores)	**177**	**137**	**223**	**275**	**372**	**346**	**370**	**443**	**620**
47.29 Retail sale of other food products (in specialized stores)	354	391	404	515	548	573	728	751	705

Source: NBS

Annex 9. Number of enterprises by business size: for 2018 and 2022 years

Statistical Classification of Economic Activities (NACE Rev. 2.1)	2018 year					2022 year				
	Total	Large	IMM			Total	Large	IMM		
			Medium	Smsll	Micro			Medium	Smsll	Micro
A AGRICULTURE, FORESTRY AND FISHING	**4,210**	**37**	**178**	**772**	**3,223**	**5,454**	**12**	**126**	**759**	**4,557**
01 Crop and animal production, hunting and related service activities	**4,086**	**34**	**160**	**760**	**3,132**	**5,315**	**12**	**105**	**748**	**4,450**
01.4 Animal production	429	6	21	35	367	638	4	13	49	572
01.41 Raising of dairy cattle	56	0	1	7	48	108	0	0	11	97
01.42 Raising of other cattle and buffaloes	15	1	0	1	13	16	0	1	2	13
01.45 Raising of sheep and goats	20	0	0	0	20	35	0	0	0	35
01.46 Raising of swine and pigs	55	5	4	6	40	49	4	2	8	35
01.47 Raising of poultry	143	0	15	19	109	138	0	10	24	104
01.49 Raising of other animals	139	0	1	2	136	291	0	0	4	287
10 Manufacture of food products	993	47	53	192	701	980	38	53	175	714
10.1 Processing and preserving of meat and production of meat products	**114**	**12**	**9**	**27**	**66**	**126**	**10**	**8**	**27**	**81**
10.11 Processing and preserving of meat, except of poultry meat	50	1	3	10	36	60	1	2	13	44
10.12 Processing and preserving of poultry meat	7	3	0	3	1	11	2	0	3	6
10.13 Production of meat and poultry meat products	57	8	6	14	29	55	7	6	11	31
10.4 Manufacture of vegetable and animal oils and fats	**80**	**2**	**2**	**10**	**66**	**70**	**3**	**2**	**10**	**55**
10.41 Manufacture of oils and fats	76	2	2	8	64	68	3	2	9	54
10.42 Manufacture of margarine and similar edible fats	4	0	0	2	2	2	0	0	1	1
10.5 Manufacture of dairy products and edible ice	**35**	**8**	**5**	**5**	**17**	**36**	**7**	**4**	**5**	**20**
10.51 Manufacture of dairy products	27	7	3	5	12	28	6	3	5	14
10.52 Manufacture of ice cream and other edible ice	8	1	2	0	5	8	1	1	0	6
10.8 Manufacture of other food products	**78**	**4**	**1**	**21**	**52**	**86**	**4**	**5**	**13**	**64**
10.85 Manufacture of prepared meals and dishes	21	0	1	9	11	14	0	2	2	10
10.86 Manufacture of homogenised food preparations and dietetic food	1	0	0	1	0	3	0	0	1	2
10.89 Manufacture of other food products n.e.c.	17	0	0	1	16	18	0	1	1	16
10.9 Manufacture of prepared animal feeds	**16**	**1**	**0**	**2**	**13**	**30**	**0**	**2**	**2**	**26**
10.91 Manufacture of prepared feeds for farm animals	12	1	0	2	9	26	0	2	2	22
28.30 Manufacture of agricultural and forestry machinery	18	1	1	5	11	15	0	2	4	9
28.93 Manufacture of machinery for food, beverage and tobacco processing	5	0	1	3	1	6	0	0	2	4
46 Wholesale trade	**7,926**	**190**	**213**	**819**	**6,704**	**7,276**	**133**	**163**	**697**	**6,283**
46.3 Wholesale of food, beverages and tobacco	1,487	44	62	195	1,186	1,363	27	43	177	1,116
46.32 Wholesale of meat and meat products	**123**	**2**	**7**	**17**	**97**	**110**	**1**	**2**	**13**	**94**
46.33 Wholesale of dairy products, eggs and edible oils and fats	**76**	**2**	**6**	**16**	**52**	**68**	**2**	**4**	**14**	**48**
46.61 Wholesale of agricultural machinery, equipment and supplies	135	5	10	11	109	151	5	6	15	125
47 Retail trade	**11,111**	**68**	**101**	**817**	**10,125**	**11,573**	**45**	**87**	**763**	**10,678**
47.2 Retail sale of food, beverages and tobacco	968	4	6	44	914	1,041	0	5	39	997
47.22 Retail sale of meat and meat products (in specialized stores)	**127**	**0**	**1**	**9**	**117**	**130**	**0**	**1**	**11**	**118**
47.29 Retail sale of other food products (in specialized stores)	238	2	1	11	224	274	0	2	9	263

Source: NBS

Annex 10. Geographical distribution of enterprises: for 2018 and 2022 years

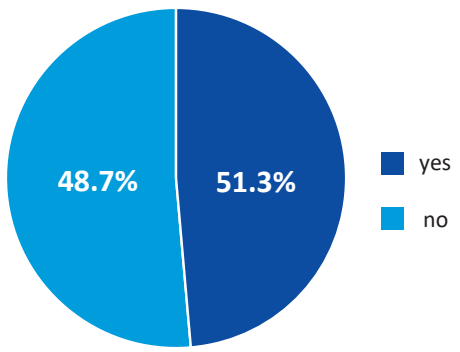
Statistical Classification of Economic Activities (NACE Rev. 2.1)	2018 year						2022 year					
	Total	Chisinau mun.	North	Center	South	ATU Gagauzia	Total	Chisinau mun.	North	Center	South	ATU Gagauzia
A AGRICULTURE, FORESTRY AND FISHING	**4,210**	**627**	**1,239**	**1,380**	**634**	**330**	**5,454**	**690**	**1,729**	**1,822**	**809**	**404**
01 Crop and animal production, hunting and related service activities	**4,086**	**593**	**1,224**	**1,332**	**614**	**323**	**5,315**	**661**	**1,707**	**1,759**	**788**	**400**
01.4 Animal production	**429**	**107**	**69**	**196**	**35**	**22**	**638**	**111**	**160**	**258**	**77**	**32**
01.41 Raising of dairy cattle	56	8	18	23	3	4	108	17	41	35	7	8
01.42 Raising of other cattle and buffaloes	15	3	6	5	1	0	16	0	5	8	3	0
01.45 Raising of sheep and goats	20	3	2	13	0	2	35	3	8	14	7	3
01.46 Raising of swine and pigs	55	18	7	21	7	2	49	14	7	19	8	1
01.47 Raising of poultry	143	39	20	62	14	8	138	42	23	52	12	9
01.49 Raising of other animals	139	36	16	72	10	5	291	35	76	130	40	10
10 Manufacture of food products	993	367	177	326	82	41	980	352	176	327	77	48
10.1 Processing and preserving of meat and production of meat products	**114**	**45**	**16**	**42**	**4**	**7**	**126**	**49**	**19**	**46**	**5**	**7**
10.11 Processing and preserving of meat, except of poultry meat	50	14	7	22	2	5	60	19	11	22	3	5
10.12 Processing and preserving of poultry meat	7	4	0	3	0	0	11	4	0	7	0	0
10.13 Production of meat and poultry meat products	57	27	9	17	2	2	55	26	8	17	2	2
10.4 Manufacture of vegetable and animal oils and fats	**80**	**21**	**25**	**22**	**9**	**3**	**70**	**19**	**17**	**20**	**9**	**5**
10.41 Manufacture of oils and fats	76	18	24	22	9	3	68	17	17	20	9	5
10.42 Manufacture of margarine and similar edible fats	4	3	1	0	0	0	2	2	0	0	0	0
10.5 Manufacture of dairy products and edible ice	**35**	**17**	**9**	**6**	**2**	**1**	**36**	**15**	**11**	**5**	**3**	**2**
10.51 Manufacture of dairy products	27	11	9	4	2	1	28	10	9	4	3	2
10.52 Manufacture of ice cream and other edible ice	8	6	0	2	0	0	8	5	2	1	0	0
10.8 Manufacture of other food products	**78**	**52**	**11**	**14**	**0**	**1**	**86**	**40**	**17**	**21**	**2**	**6**
10.85 Manufacture of prepared meals and dishes	21	13	4	4	0	0	14	3	5	4	0	2
10.86 Manufacture of homogenised food preparations and dietetic food	1	1	0	0	0	0	3	3	0	0	0	0
10.89 Manufacture of other food products n.e.c.	17	12	1	3	0	1	18	10	2	4	1	1
10.9 Manufacture of prepared animal feeds	**16**	**4**	**2**	**8**	**2**	**0**	**30**	**11**	**5**	**9**	**4**	**1**
10.91 Manufacture of prepared feeds for farm animals	12	1	1	8	2	0	26	8	4	9	4	1
28.30 Manufacture of agricultural and forestry machinery	18	12	4	2	0	0	15	7	4	2	1	1
28.93 Manufacture of machinery for food, beverage and tobacco processing	5	3	0	2	0	0	6	4	0	2	0	0
46 Wholesale trade	7,926	6,171	585	858	173	139	7,276	5,396	587	910	211	172
46.3 Wholesale of food, beverages and tobacco	1,487	1,078	117	225	33	34	1,363	909	124	247	41	42
46.32 Wholesale of meat and meat products	**123**	**83**	**16**	**18**	**2**	**4**	**110**	**71**	**17**	**13**	**5**	**4**
46.33 Wholesale of dairy products, eggs and edible oils and fats	**76**	**51**	**10**	**11**	**4**	**0**	**68**	**41**	**14**	**7**	**6**	**0**
46.61 Wholesale of agricultural machinery, equipment and supplies	135	93	11	20	4	7	151	105	14	17	10	5
47 Retail trade	11,111	5,922	1,845	2,122	777	445	11,573	5,817	2,014	2,373	893	476
47.2 Retail sale of food, beverages and tobacco	968	596	92	218	38	24	1,041	624	101	228	58	30
47.22 Retail sale of meat and meat products (in specialized stores)	**127**	**63**	**15**	**37**	**8**	**4**	**130**	**57**	**19**	**44**	**7**	**3**
47.29 Retail sale of other food products (in specialized stores)	238	139	20	63	5	11	274	166	22	63	12	11

Source: NBS

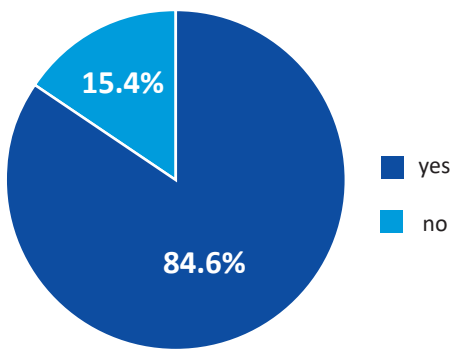
Annex 11. FBOs survey results

Legislation

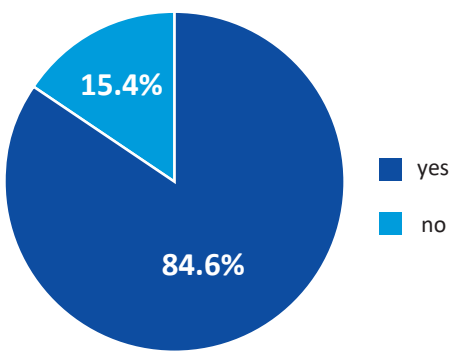
Are or have you been involved in elaboration of new legislation in your field of activities? (yes; no)



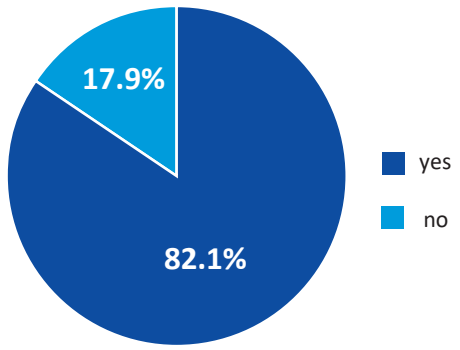
Do you receive the new legislation timely once it is in force? (yes; no)



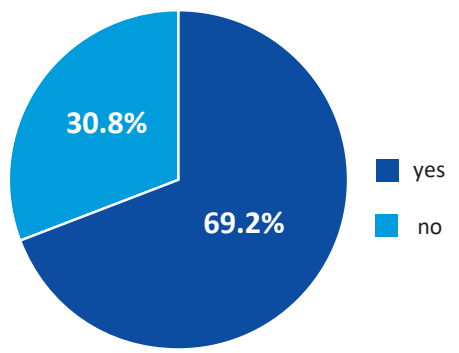
Do you receive the update legislation timely? (yes; no)



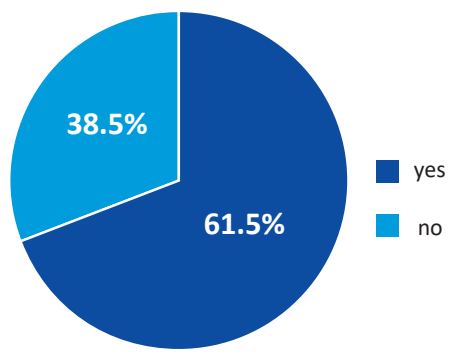
Do you receive information on legislation from MAIA? (yes; no)



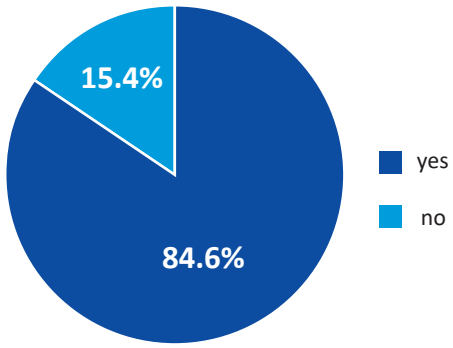
Do you receive information on legislation from ANSA? (yes; no)



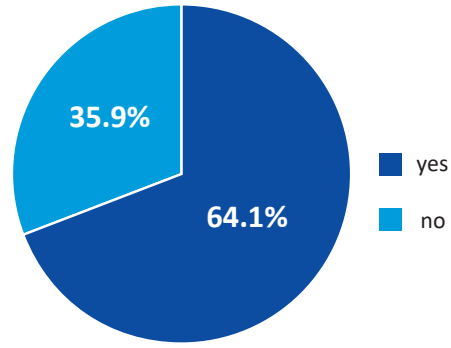
Do you receive information on legislation from MDED? (yes; no)



Do government institutions organize discussions on implementation of requirements requested from the new or updated legislation? (yes; no)

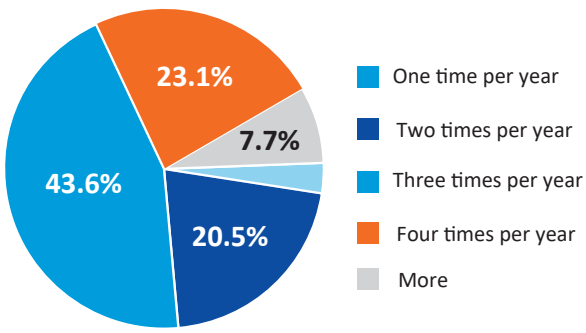


Do you have enough time to comply with the new provisions of the legislation? (yes; no)

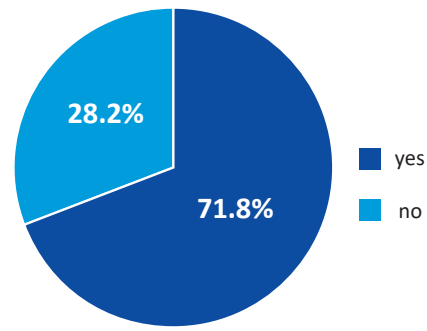


Official control

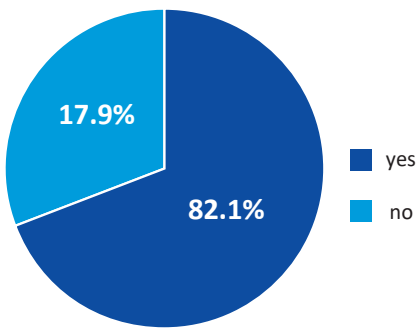
How often are you inspected by ANSA? (One time per year; two times per year; three times per year; four times per year; more)



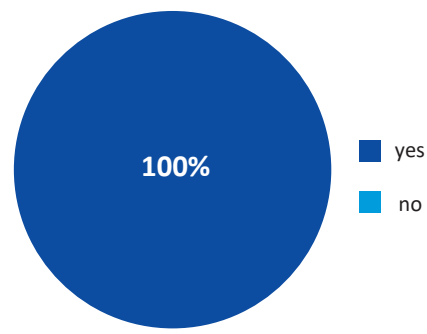
Are you informed preventively about taking samples for monitoring? (yes; no)



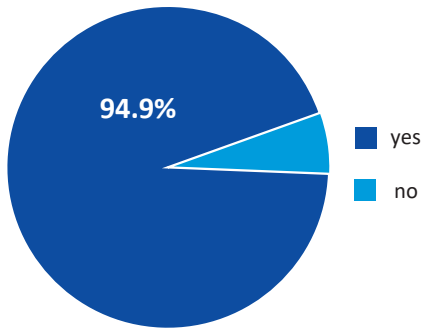
Are you informed preventively about official control? (yes; no)



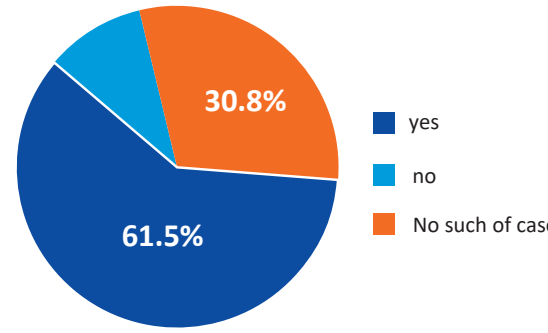
Do the inspectors use checklists for official control? (yes; no)



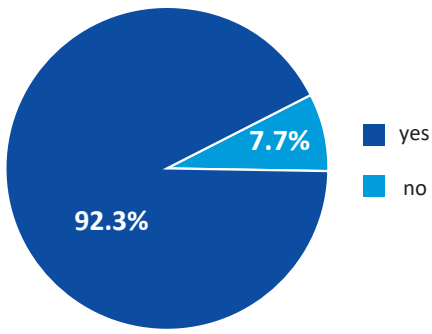
Are the conclusions and recommendations from checklists clearly provided? (yes; no)



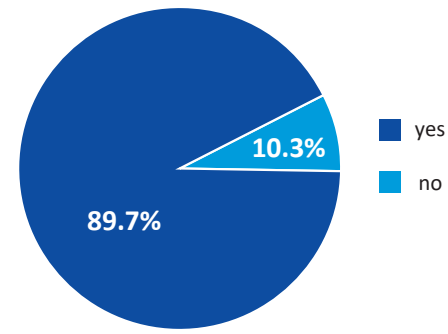
Do you agree with sanctions in case of applying? (yes; no; no such of case)



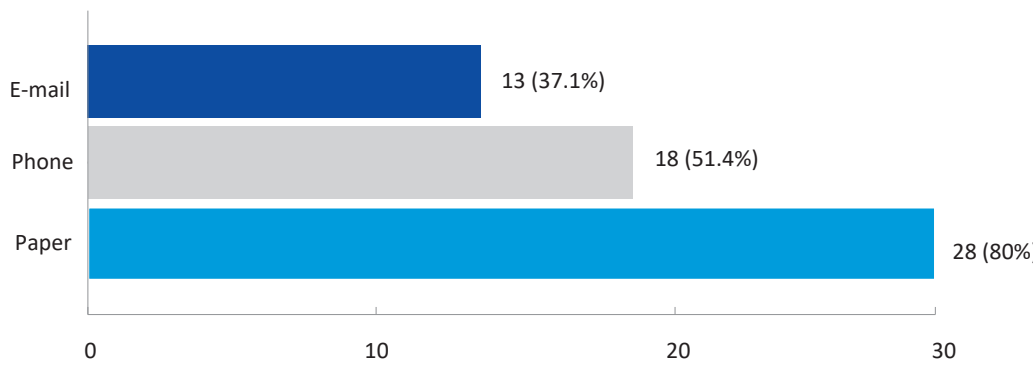
Are the conclusions and recommendations from checklists understandable? (yes; no)



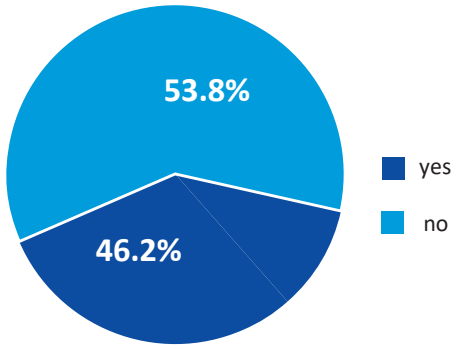
Are you informed about official control test results? (yes; no)



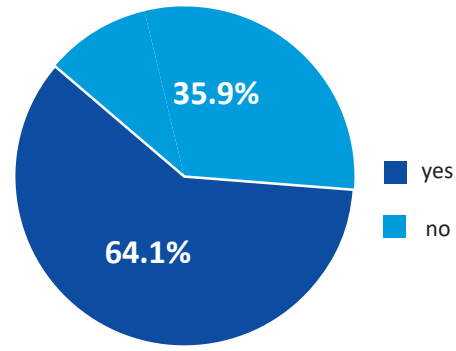
If yes in what format?



Do you pay for the negative test results? (yes; no)

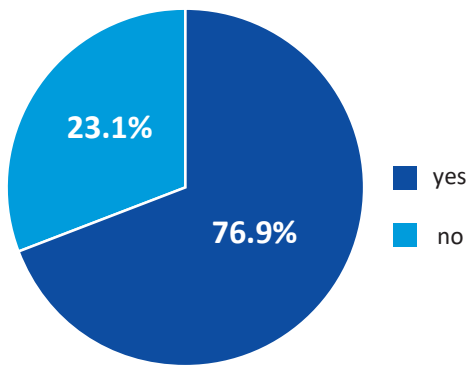


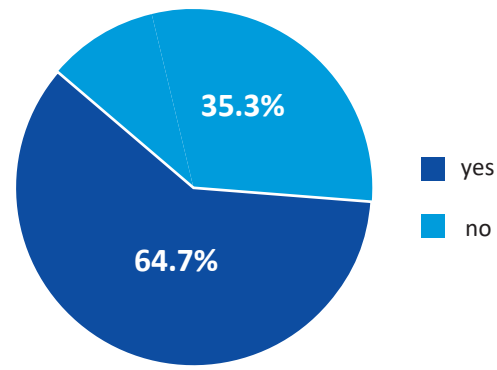
Are the inspectors professional and competent on the issue? (yes; no)



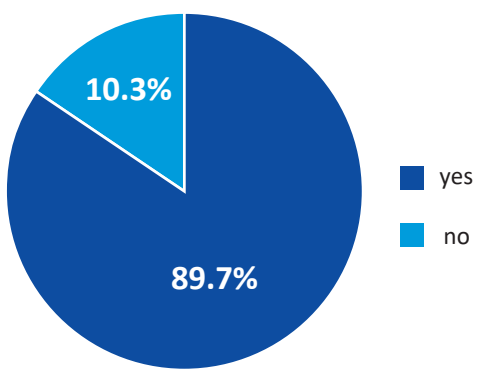
Self-control

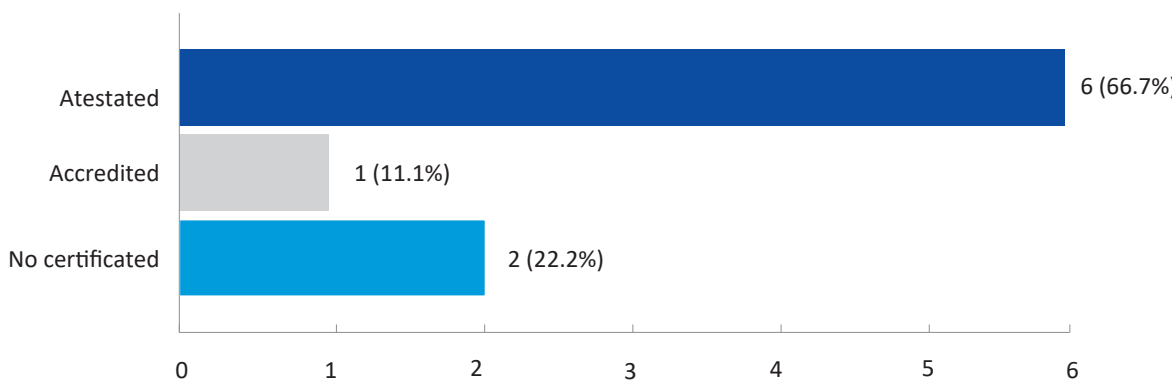
Do you have a laboratory within the production / company? (yes; no) If yes, is it certified? (atestated; accredited; no certificated) If no, do you have contracts with other laboratories? (yes; no)



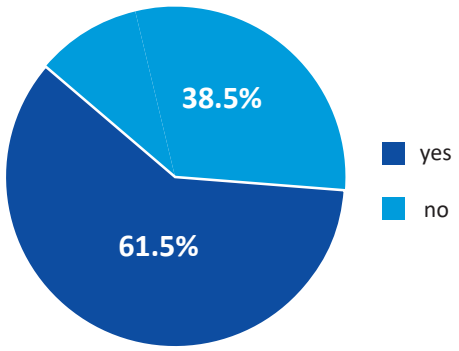


Are you satisfied with the logistics of taking laboratory samples? (yes; no)

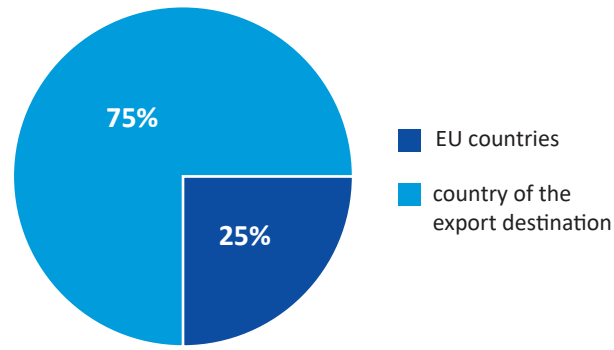




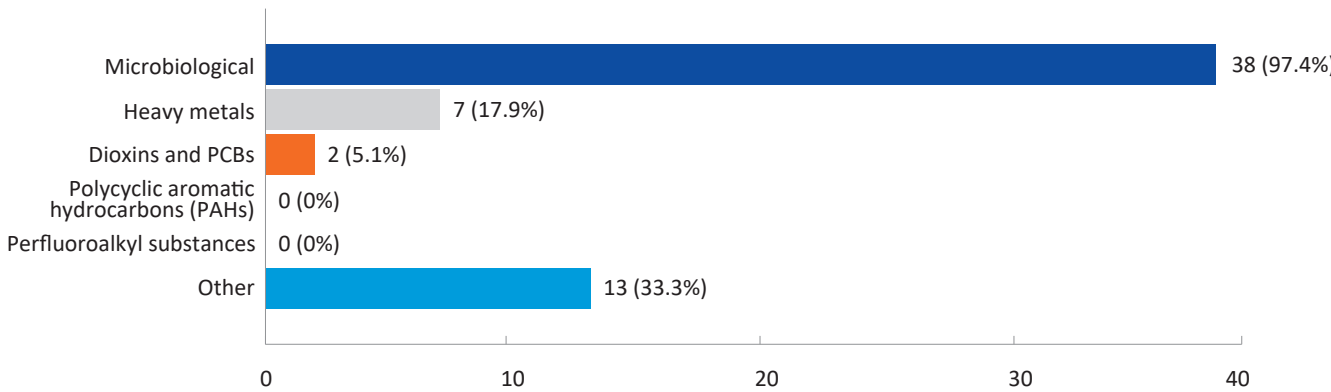
Is it provided by the laboratory the full package of indicators necessary for the export product? (yes; no)



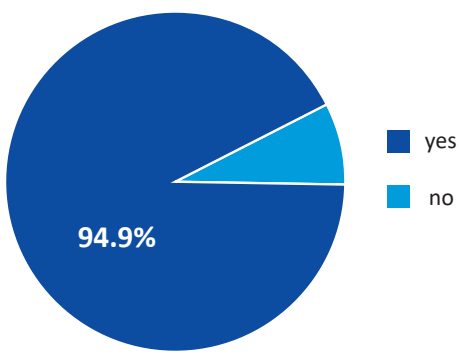
If no, where do you do the test? (EU countries; country of the export destination)



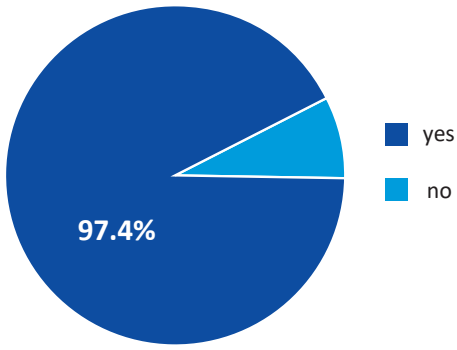
For what indicators do you perform the test? (microbiological; heavy metals; dioxins and PCBs; polycyclic aromatic hydrocarbons (PAHs); perfluoroalkyl substances; other)



Does the self-control plan check during official control? (yes; no)

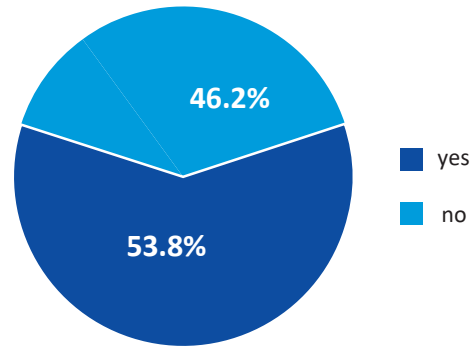


s it clear for the company the self- control plan for products? (yes; no)

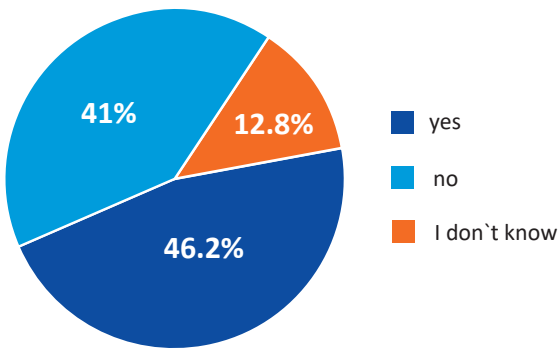


Production

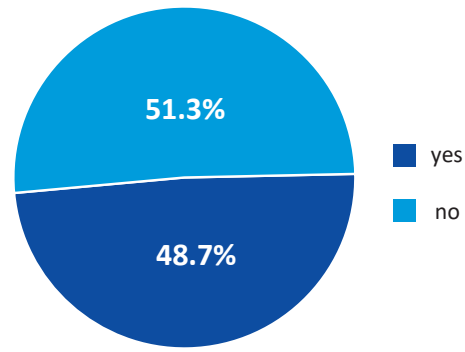
Do you do calibration of the machinery and equipment? (yes; no)



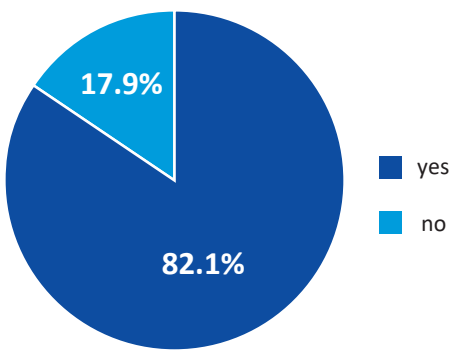
Do you have guides for the implementation of self-control? (yes; no; I don't know)



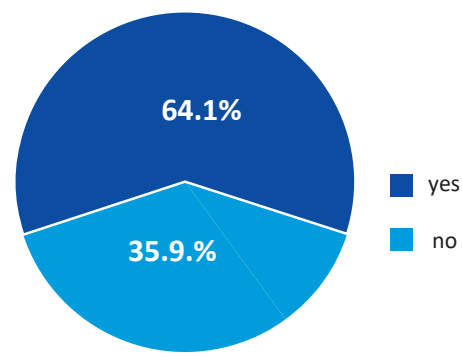
Are you satisfied with the requirements for metrology? (yes; no)



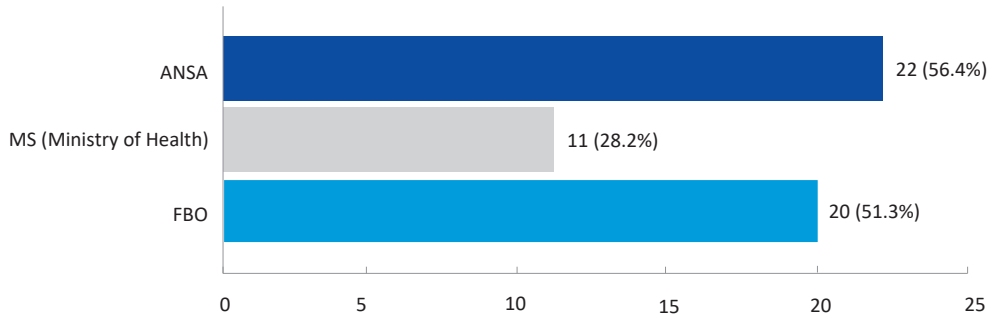
Have you been trained on calibration of the machinery and equipment? (yes; no)



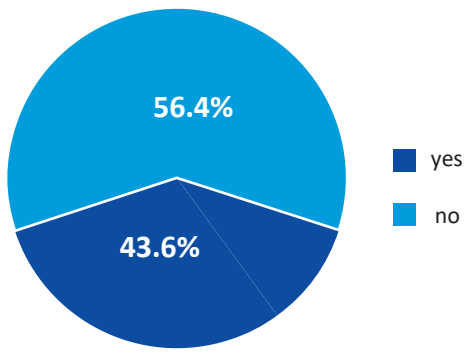
Are you satisfied with the procedure of the approval of the new products (standards)? (yes; no) Do you think this procedure needs to be approved by the Ministry of Health? (yes; no)

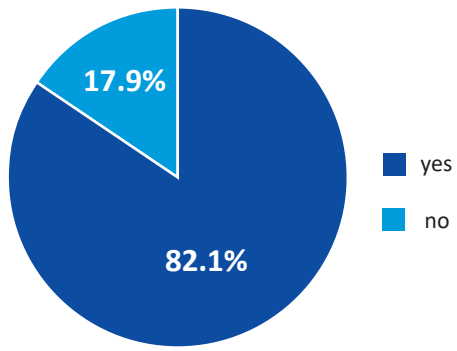


Who is responsible for the food safety of the products placed on the market? (ANSA; MS (Ministry of Health); FBO)



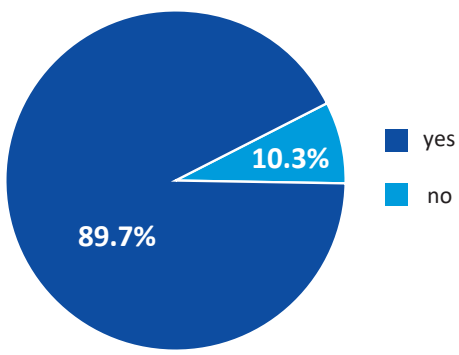
Did you receive government support in the last 5 years? (yes; no) If yes, name it for what



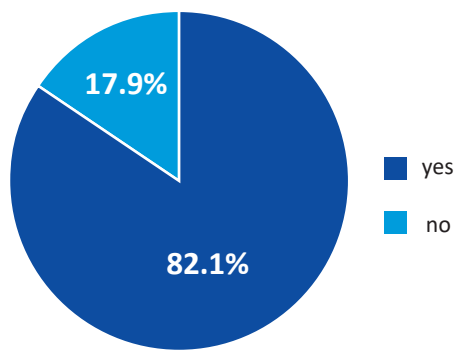


Subsidies and financial support

Did you receive support from the donors in the last 5 years? (yes; no) If yes, name it please.

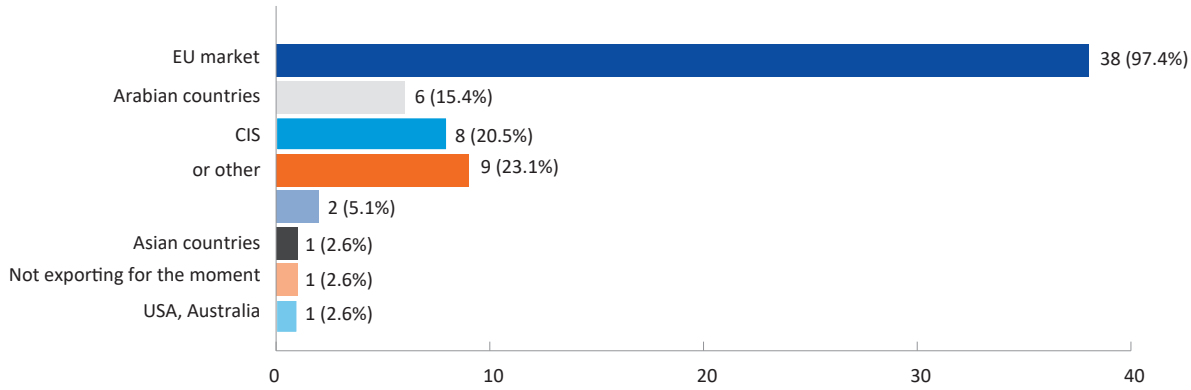


Are you satisfied with the government support policies? (yes; no)

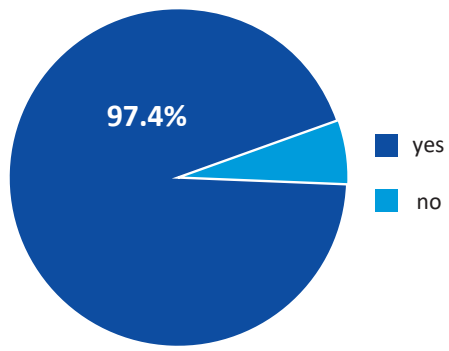


Export

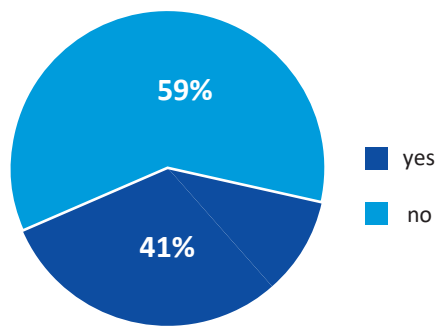
In which market are you interested in exporting your products? (EU market; Arabian countries; CIS; or other)



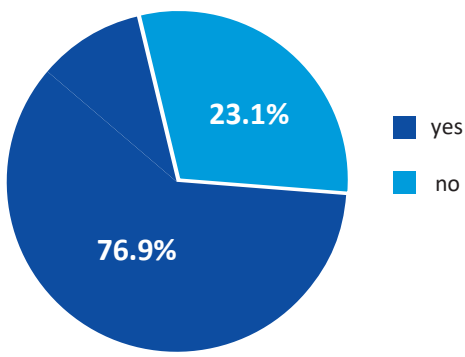
Are you interested in the EU market (yes, no) if no, please give us an answer why?



Does your company face difficulties with the customs requirements regarding export? (yes; no)

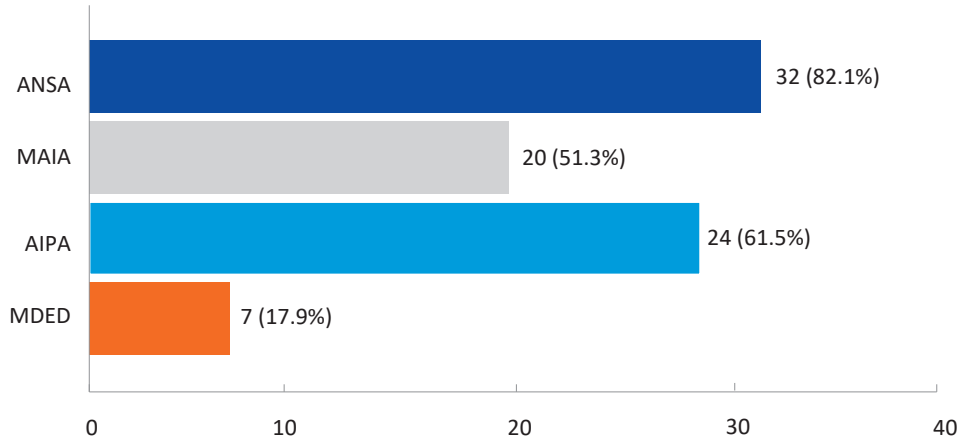


Does the national legislation comply with the regulatory norms of the interested market for export? (yes; no)

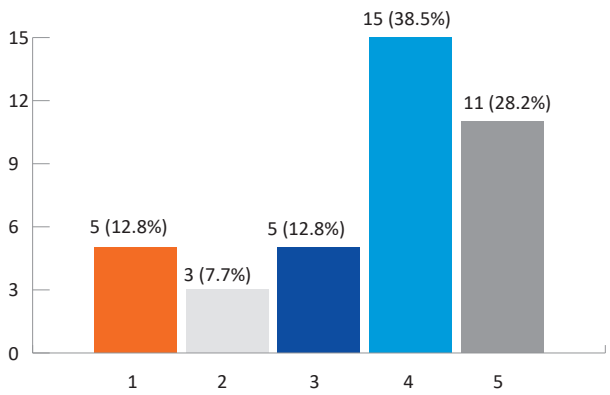


Training

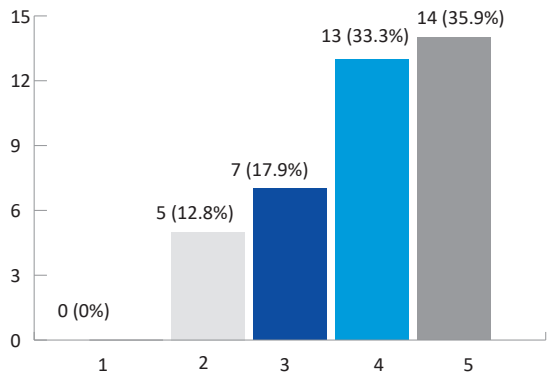
Do you receive training from governmental institutions? (ANSA; MAIA; AIPA; MDED)



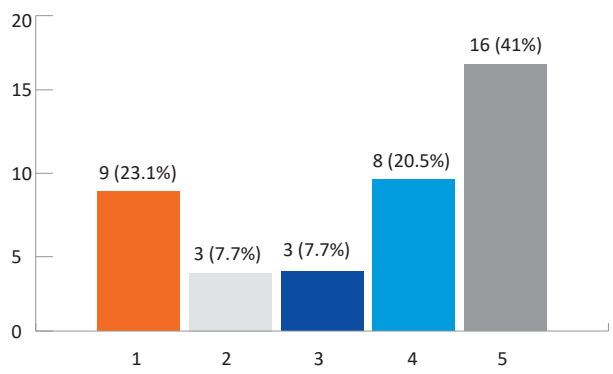
Are you satisfied with the training organised by MAIA? (yes; no; partially)



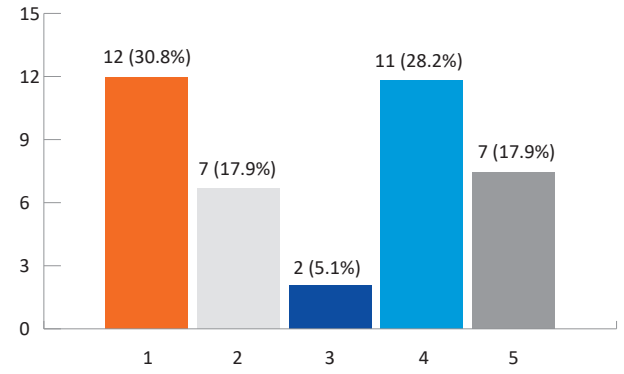
Are you satisfied with the training organised by AIPA? (yes; no; partially)



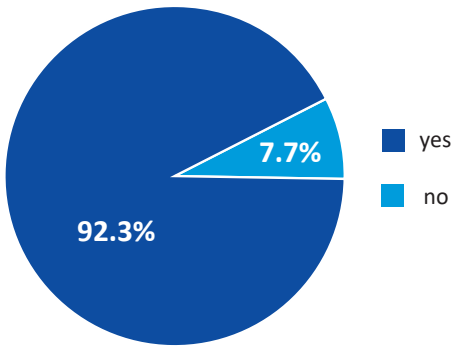
Are you satisfied with the training organised by ANSA? (yes; no; partially)



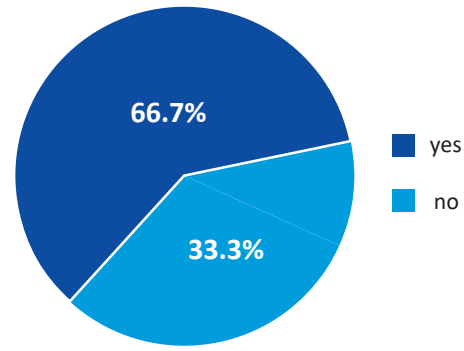
Are you satisfied with the training organised by MDED? (yes; no; partially)



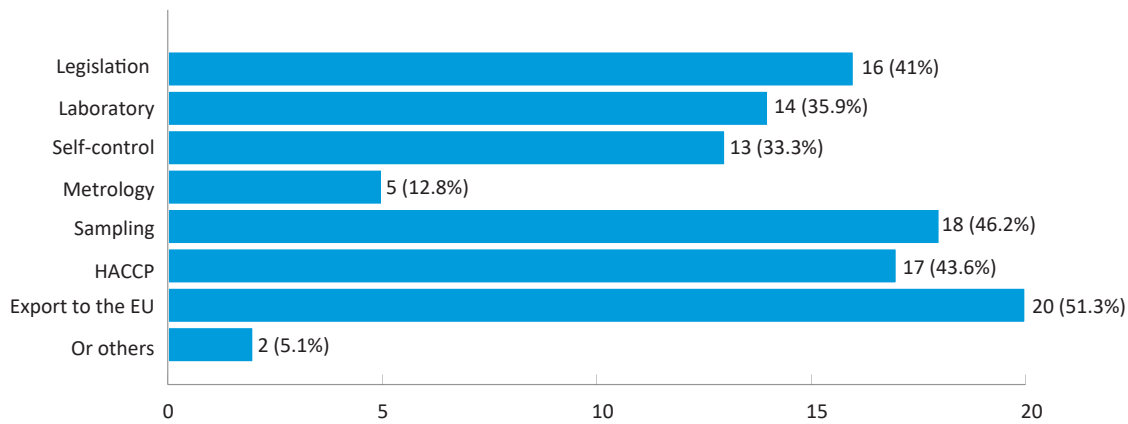
Do you need a training course related to your activity? (yes; no)



Is your personnel trained on HACCP (have a certificate)? (yes; no)

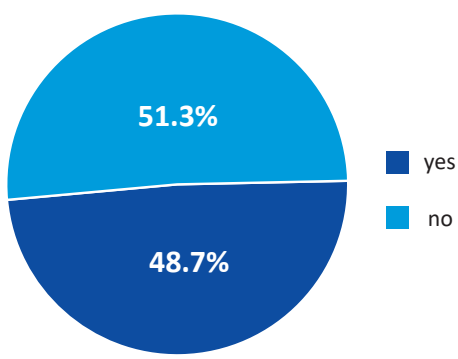


In what sector or dimension do you need a training course?

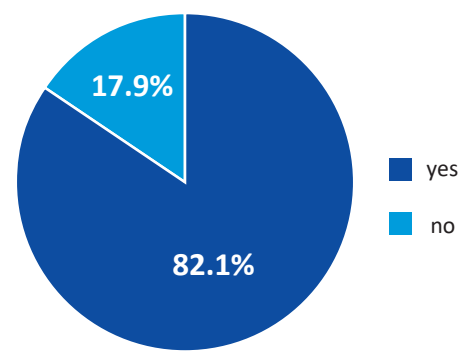


Human resources

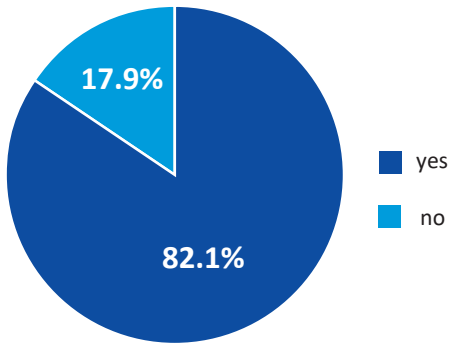
Do you have enough employees in your company? (yes; no)



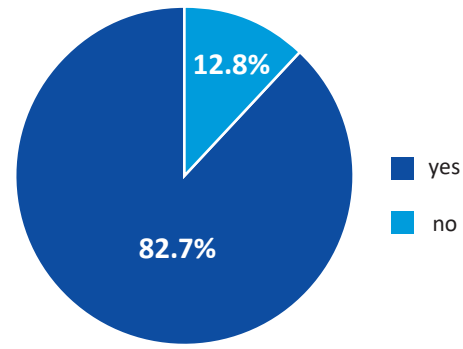
Are the personnel qualified enough for their position in the company? (yes; no)



Are you satisfied with the Food Hygiene system certification for the personnel? (yes; no)



Are the Food Hygiene certified personnel qualified enough for their position in the company? (yes; no)



Annex 12. Laboratories mapping according to the information provided in interviews and questionnaires

Name of Laboratory	General information								
	Status	Main activities	Analytical services	Performance cervices	Target uses	Products	Funding	Relationship	Authorization
CRDV Food products testing	Refer-ence lab	Quality control Testing Education	Organo-leptic Food microbiol-ogy Food chemistry Residues Contami-nate	Self-control Import control Food control Export control Routine surveil-lance Technical support for industry	Govern-ment Food industry	Milk Dairy products Red meat Poultry Eggs	Govern-ment Donors	ANSA MAIA UTM USM	MOLDAC ac-creditation
CRDV Ani-mal health	Refer-ence lab	Quality control Testing Education	Organolep-tic Veteri-nary testing Veterinary medical products	Self-control Import control Food control Export control Routine surveil-lance Technical support for industry	Govern-ment Food industry		Govern-ment Donors	ANSA MAIA UTM USM	MOLDAC ac-creditation
Imunoteh-nomed	Privet lab	Testing	Food chemistry Residue Contami-nant Veteri-nary testing	Self-control Import control Food control	ANSA Food industry	Milk Dairy products Red meat Poultry Eggs	Own capital		MOLDAC ac-creditation
ANSP	National lab	Quality control Certifica-tion Testing	Organolep-tic Food chem-istry Con-taminant Pesticides residue Wa-ter testing	Certification	Food industry	Raw milk Red meat Poultry Eggs	JIKA WHO EU projects	ANSA	MOLDAC ac-creditation

Source: Elaborated by the authors, based on information gathered from interviews and questionnaires conducted with the laboratories

Factors limiting performance of laboratories

	CRDV food test	CRDV animal health	Imuno-tehnomed	ANSP
Space	yes	yes	yes	no
Education	yes	yes	no	yes
Financial	yes	yes	yes	no
Equipment	yes	yes	yes	yes
Personal	yes	yes	no	yes
Others	no	no	yes	no

SOPs available

	CRDV food test	CRDV animal health	Imuno-tehnomed	ANSP
Reception of samples	yes	yes	yes	yes
Evidence storage	yes	yes	yes	no
Test requests	yes	yes	yes	no
Sampling of samples	yes	yes	no	no
Conducting tests	yes	yes	yes	yes
Reporting results	yes	yes	yes	yes
Review and release of results	yes	yes	yes	yes
Instrument operations and calibration	yes	yes	yes	no
Training and training registration	yes	yes	yes	no
Measurement uncertainty	yes	yes	yes	yes
Validation	yes	yes	yes	yes
Waste disposal	yes	yes	yes	no

Implementation of the Quality Management System

Elements of the QA/QC program	CRDV food test	CRDV animal health	Imuno-tehnomed	ANSP
Quality manager	yes	yes	yes	yes
Quality manual	yes	yes	yes	yes
Quality management review plan	no	no	no	no
Environmental controls	yes	no	no	yes
Laboratory waste disposal system	yes	yes	no	no
Equipment calibration	yes	yes	yes	yes
Preventive maintenance program for instruments	yes	yes	yes	yes
Control charts	yes	yes	yes	no
Documented standardized procedures and methods	yes	yes	yes	yes
Internal control of laboratory procedures (blind e.g.)	no	no	yes	yes
Use of standards and reference materials	yes	yes	yes	yes
Test report form	yes	yes	yes	yes
The procedure for authorized personnel to issue and sign the results of laboratory analyses	yes	yes	yes	yes

Human resources

	CRDV food test	CRDV animal health	Imuno-tehnomed	ANSP
HR				
University graduates: (DR; M.Sc.)	**18 (DR 3)**	**25**	**4 (DR 2)**	**14**
High school, 3 years experience	**no**	**no**	**no**	**no**
High school, less than 3 years experience	**no**	**no**	**no**	**no**
Technician	**4**	**4**	**2**	**2**
Administrative staff (non-technical)	**1**		**7**	**2**
Service staff, cleaning, maintenance, etc.	**2**	**4**	**2**	**4**
Totally personal	**24**	**33**	**15**	**27**
Staff training				
Regular training program	**yes**	**yes**	**yes**	**yes**
Training program for new staff	**yes**	**yes**	**yes**	**yes**
Budget allocation for training	**yes**	**yes**	**no**	**yes**
The annual budget for training	**yes**	**yes**	**yes**	**yes**
Training program evaluation system	**yes**	**yes**	**no**	**yes**
Staff performance evaluation system	**yes**	**yes**	**yes**	**yes**
Staff training registration system	**yes**	**yes**	**no**	**yes**

Instruments and equipment

Main tools and equipment available	CRDV food test	CRDV animal health	Imuno-tehnomed	ANSP
Atomic Absorption Spectrometer	yes		yes	yes
Autoclave (clean)	yes		yes	
Autoclave (dirty)	yes	yes		
Biosafety cabinet class II	yes	yes	yes	
ELISA equipment (Washer/Incubator/Reader)	yes	yes	yes	
Dry ice machine	no	no		
Freezer -20°C	yes	yes	yes	yes
Washing machine for glassware	no	no		
Gas Chromatography with different detection systems (please, specify)	yes			yes
ICP/MS etc.	no			
LC/MS/MS	yes			
PCR tool, quant Studio 5		yes		
PCR instrument, MIC		yes		
Liquid chromatograph				yes
Molecular spectrophotometer				yes
FID detector, Shimadzu				yes

Source: Elaborated by the authors, based on information collected from the laboratories

Annex 13. Testing laboratories on food products, methods

	CRDV			ANSP		Lab testing alcoholic and non-alcoholic	Imunotehnomed	Bessara-bia-Nord
	Chisinau	Donduseni	Balti	Lab Diag-nostic	Lab testing			
Organoleptic	yes							yes
Salmonella	yes	yes		yes	yes			yes
Listeria monocy-togenes	yes	yes		no	yes			
S. aureus	yes	yes		yes	yes			yes
B. cereus		no			yes			
Clostridium perfringens		no			yes			
Sulphite reduc-ing bacteria	yes	yes (GOST)						
Coliforms	yes	yes		yes	yes			yes
Enumeration of microorganisms	yes	yes		no				
Yeasts and Molds	yes ISO	yes ISO		yes (POS)	yes			yes (NOT VALI-DATE)
Enterobacte-riaceae	yes	yes		yes	yes			
E. coli	yes	yes		yes	yes			
Proteus	no	no		no				
Enterococci	no	no		no				
Salmonellas spp.	yes	no		yes				
Total number 30 C	no	yes		yes				yes
Somatic cells	yes	yes		no				
Industrially sterilized	yes				yes (GOST)			
Bifidumbacte-riilor					yes			
Cronobacter spp					yes			
Lead	yes				yes			
Cadmium	yes				yes			
Arsenic	yes				yes (GOST)			
Mercury	yes				yes			
Copper	no				yes			
Residues of veterinary drugs								
Beta-lactam	yes							
Sulphonamide	yes							
Macrolides	yes						yes	
Tetracyclines	yes							
Quinolones	yes							
Benzimidazole	yes							
Beta agonists	yes							
Ivermectin	yes							
Coccidiostats	yes							

(continue)

	CRDV			ANSP		Lab testing alcoholic and non-alcoholic	Imunotehnomed	Bessara-bia-Nord
	Chisinau	Donduseni	Balti	Lab Diag-nostic	Lab testing			
Carbadox, Olaquindox	yes							
Avermectins	yes							
Erythromicin	no						yes	
Fluorquinolone	no						yes	
Tylosin	no						yes	
Gentamicin	no						yes	
Screening meth-od m/o	no						yes	
Neomicin	no						yes	
Mycotoxin							yes	
Aflatox B1				yes	yes	yes		
Pesticides					yes			
Allergens							yes	
Nitrate	no							
Nitrite	yes			yes				yes
Iron				yes				
Phosphorus	yes							yes
Chloride		yes (GOST)		yes				
Proteins	yes			yes			yes	
Fat	yes							
Purity fats	yes							
Total fat								yes
Salt	yes (ISO)					yes		yes (GOST)
Chloride	yes							
Starch	yes			yes				yes
Moisture				yes				yes
Amount of total water	yes			no				
Collagen / Protein	yes			no				
Acidity	yes							
Cryoscopes	yes							
Energy value	yes							
Polycyclic aromatic hydrocarbons (PAHs) (Benzo(a) pyrene)					yes			
Perfluoroalkyl substances								
Dioxins and PCBs								
Radioactive contamination								
Sr-90, Cs-137					yes (GOST)	yes		

Source: Elaborated by the authors, based on information collected from the laboratories

Annex 14. Testing Laboratories on animal health, methods

	Chisinau	Drochia
Determination of the content of radionuclides: Cesium – 137; Strontium-90	yes	no
Molecular biology methods		
Identification of the Newcastle disease virus genome by Real-time PCR	yes	no
Identification of the avian influenza virus genome (matrix protein) by Real-time PCR	yes	no
Identification of the African swine fever virus genome by Real-time PCR	yes	no
Identification of the FMD virus genome by Real-time PCR	yes	no
Identification of the hemagglutinin H5 subtype of the avian influenza virus by Real-Time PCR	yes	no
Identification of the hemagglutinin H7 subtype of the avian influenza virus by Real-Time PCR	yes	no
Identification of the neuraminidase N1 subtype of the avian influenza virus by Real-Time PCR	yes	no
Virological methods		
Determination of rabies antigen by the direct immunofluorescence method (IFD)	yes	no
Determination of the vaccine marker (tetracycline)	yes	no
Determination of post-vaccination anti-rabies antibodies by enzyme-linked immunosorbent assay (ELISA)	yes	no
Immunoenzymatic methods		
Determination of specific antibodies to the avian influenza virus by the ELISA method	yes	no
Determination of African swine fever antiviral antibodies by immunoenzymatic technique (ELISA)	yes	no
African swine fever virus antigen determination by immunoenzymatic technique (ELISA Ag)	yes	no
Determination of antibodies to foot-and-mouth disease viruses by immunoenzymatic technique (ELISA)	yes	no
Detection of antibodies against enzootic bovine leukosis virus in blood serum and milk by immunoenzymatic test (ELISA)	no	yes
Detection of antibodies against enzootic bovine leukosis virus in blood serum by the indirect immunoenzymatic method (ELISA)	no	yes
Serological methods		
Determination of antibodies against B. abortus, B. melitensis, B. suis in blood serum with antigen stained with PINK-BENGAL	no	yes
Determination of antibodies against B. abortus, B. melitensis, B. suis in blood serum by the complement fixation microtechnique	no	yes
Salmonella	yes	no
Escherichia coli	yes	no
Escherichia coli and coliform bacteria	yes	no
Coliform bacteria	yes	no
Colony-forming microorganisms at 22 °C and 36 °C	yes	no
Colony-forming microorganisms at 30°C	yes	no
Determination and enumeration of intestinal enterococci	yes	no
Detection and enumeration of Pseudomonas aeruginosa. Membrane filtration method.	yes	no
Mycobacterium, involved in bovine tuberculosis and inlfuenza	yes	no
Parasitological examination by visual inspection of the fish Fish (trunk, head, fillet, spine), live fish and frozen fish products.	yes	no
Identification of Varroa spp in bees by examination macroscopic and microscopic	yes	no

Source: Elaborated by the authors, based on information collected from the laboratories

Annex 15. Laboratory services for Residues Monitoring Plan implementation on animal products for the year 2023 (poultry meat, eggs for consumption, milk, beef, sheep and pork)

No.	Group of substances	Index from the residues group	Method accreditation
		Other laboratory	
1.	**Nitrofurans**	Nitrofurantoin metabolites, Furaltadone metabolites, AOZ, AMOZ, SEM, AHD	**LC-MS/MS method**
2.	**Nitroimidazoles**	Ronidazole, Dimetridazole, HMMNI=RNZOH=DMZOH, MNZ-OH, Metronidazole Ipronidazole ,, Ipronidazole -OH"	**LC-MS/MS method**
3.	**Stilbene group**	Stilbene Group (dienitol, diethylstilbestrol, hexestrol, benzestrol)	**LC-MS/MS method**
4.	**Resorcylic acid lactone group**	Resorcylic acid lactone group (alpha zeranol, beta zearalenol, zearalenol, zearalanone)	**LC-MS/MS method**
5.	**Amitraz**	Amitraz	**LC-MS/MS method**
6.	**Bromopropylate, Diflubenzuron**	Bromopropylate, Diflubenzuron	**GC-MS/MS method**
7.	**Dyes**	Malachite dyes green, Crystal violet, Malachite GREENE leuco, Crystal violet leuco, Brilliant Green, Sum of Malachite green and Malachite GREENE Leuco	**LC-MS/MS method**
8.	**Steroids**	Steroids (17 alpha trenbolone, 17 beta trenbolone, stanozolol, 16 beta hydroxystanozolol, 17 alpha boldenone, 17 beta boldenone, 17 alpha nortestosterone, 17 beta nortestosterone, methylboldenone, methyltestosterone, 17 alpha testosterone, 17 beta testosterone, chlorandrostenedione, chlormadinone acetate, megestrol acetate, medroxyprogesterone acetate, melengestrol acetate)	**LC-MS/MS method**
9.	**Dioxins and dioxin-like PCBs**	Sum of dioxins (WHO-PCDD/F-TEQ) Sum of dioxins (WHO-PCDD/F-PCB-TEQ)	**GC-MS/MS method**
10.	**Cephalosporins, lactam**	Cephalosporins: (cephalexin, cefazolin, cefoperazone, ceftiofur, benzpenicillin, phenoxymethylpenicillin, cloxacillin, dicloxacin, nafcillin, desacetylcephapirin)	**LC-MS/MS method**
11.	**Aminoglycosides**	Aminoglycosides gentamicin, neomycin, streptomycin, spectinomycin, lincomycin, kanamycin, dihydrostreptomycin	**LC-MS/MS method**
13.	**Lincosamides**	Lincosamides: Lincomycin, Pirlimycin	**LC-MS/MS method**
14.	**Pleuromutilins**	Pleuromutilins: Tiamulin, 8-alpha- Hydroxy - mutilin, Valnemulin	**LC-MS/MS method**
15.	**Amphenicols**	Chloramphenicol, thiamphenicol, florfenicol	**LC-MS/MS method**
16.	**POLYPEPTIDE**	Colistin	**LC-MS/MS method**
17.	**PESTICIDES**	PCBs-28, 52, 101, 138, 153, 180	**GC ECD method Method GC MS/MS**
18.	**Coccidiostats**	Monensin, salinomycin, nicarbasin, lasalocid, narasin, maduramycin, robenidine, diclazuril, semduramycin, halofuginone, decoquinate, tolrazuril, aprinocide, clopidol	**LC-MS/MS method**
19.	**Anthelmintic**	Avermectins: moxidectin, abamectin, doramectin, ivermectin, eprinomectin)	**LC-MS/MS method**
20.	**Carbamates**	Carbaryl, Carbofuran	**GC-MS/MS method**
21.	**Dapsone Ormethoprim Trimethoprim**	Dapsone Ormethoprim Trimethoprim	**GC-MS/MS method**
22.	**PAH**	Benzanthracene, Benzo (b) fluoranthene, Benzo (a) pyrene, Chrysene, Sum of PAHs 4	**GC-MS/MS method**
23.	**PESTICIDES**	Fipronil, arprinocid, clopidol, Bromopropylate, Hexachlorobenzene, dimoxystrobi, thiacloprid, azoxystrobin, acetamiprid, tebuconazole, trifloxystrobin, boscalid, bithetrin Deltamethrin, Cyfluthrin, Cypemethrin, Fenvelarat / Esfenvelarat, Diazinon	**GC-MS/MS method**
24.	**Glyphosate**	Glyphosate	**GC-MS/MS method**
25.	**NSAIDs, corticosteroids and glucocorticoids**	Phenylbutazone, Ibuprofen, Naproxen, Flufenamic acid, Mefenamic acid, Oxyphenbutazone, Niflumic acid, Carprofen, tolfenamic acid, flunixin, diclofenac, meloxicam, 4-formylaminoantipyrin, ketoprofen, dexamethasone	**GC-MS/MS method**

(continue)

No.	Group of substances	Index from the residues group	Method accreditation
		CRCVD	
1.	**Chloramphenicol**	Chloramphenicol	**ELISE**
2.	**Beta agonists**	Brombuterol, Clenbuterol, Isoxsuprine Zilpaterol, Salbutamol, Ractopamine	**LC-MS/MS method**
3.	**Antibiotics**	Tetracycline + 4-epi tetracycline (TC + epiTC), oxytetracycline + 4-epi oxytetracycline (OTC + epiOTC), chlortetracycline + 4-epi chlortetracycline (CTC + epiCTC), doxycycline (DC), Methacycline	**LC-MS/MS method**
4.	**Sulfanilamides**	Sulfachlorpyridazine, sulfadiazine, sulfadimethoxine, sulfaguanidine, sulfamerazine, sulfamethazine, sulfamethizole, sulfamethoxypyridazine, sulfamethoxazole, sulfanilamide, sulfapyridine, sulfaquinoxaline, sulfathiazole, sulfisoxazole, Sulfacetamide, Sulfabenzamide Sulfadoxine, Sulfamonometoxin, Sulfamoxole, Sulfameter, Sulfaclosine, Sulfaetoxypyridazine, Suulfanitrane, Sulfisomidine;	
5.	**Quinolones**	Flumequine (FLUM), Nalidixic Acid (NDX), Oxolinic Acid (OXO), Norofloxacin (NOR), Ciprofloxacin (CIPRO), Danofloxacin (DANO), Enrofloxacin (ENRO), Marbofloxacin (MARBO), Sarafloxacin (SARA), Difloxacin (DIF), Cinoxacin, Enoxacin, Fleroxacin, Lomefloxacin, Ofloxacin, Orbifloxacin, Sparfloxacin	**LC-MS/MS method**
6.	**Lactam**	Betalactams (Amoxicillin, Ampicillin, Benzylpenicillin)	
7.	**Macrolides**	Macrolides (Spiramycin, Erythromycin, Tilmicosin, Tylosin) Josamycin, Tulathromycin (TULA), Tylvalosin (TYLVAL), Oleandromicin, Desmicosin, Gamithromycin (GAMI);	**LC-MS/MS method**
8.	**Benzimidazole**	Abendazole, Albendazole-2-aminosulfone, Albendazole sulfone, Amino-flubendazole, Amino-mebendazole, Clorsulon, Closantel, Febantel, Fenbendazole, Fenbendazole sulfoxide, Fenbendazole sulfone, Flubendazole, Hydroximebendazole, Hydroxythiabendazole, Levamisole, Mebendazole, Niclosamide, Nitroxinil, Oxibendazole, Oxychlorzanide, Rafoxanide, Thiabendazole, Triclabendazole, Triclabendazole sulfone, Triclabendazole sulfoxides	**LC-MS/MS method**
9.	**Avermectin:**	Moxidectin, Abamectin, Doramectin, Ivermectin, Eprinomectin, Emamectin	**LC-MS/MS method**
10.	**Coccidiostats**	Nicarbazin, Salinomycin, Narasin, Robenidin, Diclazuril, Maduramycin, Monensin Halofuginone, Decoquinate	**LC-MS/MS method**
11.	**Corticosteroids**	Dexamethasone (DEX) Betamethasone (BET), Prednisolone (PRL), Methylprednisolone (MePRL), Prednisone (PRD), Cortisone (CZ), Hydrocortisone (HC), Methylprednisone (MePRD), Flumetasone (FLU) Beclomethasone (BEC), Triamcinolone acetonide (TRIA), Isoflupredone (IZO)	**LC-MS/MS method**
12.	**Streptomycin**	Streptomycin	**ELISE**
13.	**Nitrofurans**	AOZ	
		amosite	
		HD	
		Sem	
14.	**Metals**	Mercury (Hg)	**Graphite Furnace and Flame Atomic Absorption Spectrometry Method**
		Cadmium (Cd)	
		Lead (Pb)	
		Arsenic (Ace)	
15.	**Mycotoxins**	Aflatoxin M1	**GFAAS**
16.	**Tetracycline**	Tetracycline	**ELISE**
	Chlortetracycline	Chlortetracycline	**ELISE**
	Oxytetracycline	Oxytetracycline	**ELISE**
	Penicillin	Penicillin	**ELISE**
17.	**Sulfanilamides**	Sulfachlorpyridazine, sulfadiazine, sulfadimethoxine, sulfaguanidine, sulfamerazine, sulfamethazine, sulfamethizole, sulfamethoxypyridazine, sulfamethoxazole, sulfanilamide, sulfapyridine, sulfaquinoxaline, sulfathiazole, sulfisoxazole, Sulfacetamide, Sulfabenzamide Sulfadoxine, Sulfamonometoxin, Sulfamoxole, Sulfameter, Sulfaclosine, Sulfaetoxypyridazine, Suulfanitrane, Sulfisomidine	**ELISE**
18.	**Metronidazole**	Metronidazole	**ELISE**
19.	**Carbadox, olaquindox**	Carbadox, olaquindox	**ELISE**
20.	**Contaminants Mycotoxins**	Aflatoxin M1	**ELISE**

Source: Elaborated by the authors based on ANSA and CRDV data

Annex 16. CRDV laboratory needs for implementation of the Residues Monitoring Plan

No.	Group index	Full technical specification required, Reference Standards	Method / Laboratory, contracted by ANSA	CRDV accredited methods/ matrix	Expansion planning / CRDV accreditation	Need for CRDV
1.	Nitrofurans	Nitrofurantoin metabolites, Furaltadone metabolites, AOZ, AMOZ, SEM, AHD	GC-MS/MS method	ELISA Tissue, milk, eggs	LC/MS/MS confirmation 2026	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
2.	Nitroimidazoles	Ronidazole, Dimetridazole, HMMNI=RNZOH=DMZOH, MNZ-OH, Metronidazole Ipronidazole, Ipronidazole -OH	GC-MS/MS method	-	LC/MS/MS confirmation 2027	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
3.	Stilbene group	Stilbene Group (dienestrol, diethylstilbestrol, hexestrol, benzestrol)	GC-MS/MS method	-	-	LC/MS/MS equipment. Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
4.	Resorcylic acid lactone group	Resorcylic acid lactone group (alpha zeranol, beta zearalenol, zearalenol, zearalanone)	GC-MS/MS method	-	-	LC/MS/MS equipment. Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
5.	Steroids	Steroids (17 alpha trenbolone, 17 beta trenbolone, stanozolol, 16 beta hydroxystanozolol, 17 alpha boldenone, 17 beta boldenone, 17 alpha nortestosterone, 17 beta nortestosterone, methylboldenone, methyltestosterone, 17 alpha testosterone, 17 beta testosterone, chlorandrostenedione, chlormadinone acetate, megestrol acetate, medroxyprogesterone acetate, melengestrol acetate)	GC-MS/MS method	-	-	LC/MS/MS equipment. Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
6.	Aminoglycosides	Aminoglycosides gentamicin, neomycin, streptomycin, spectinomycin, lincomycin, kanamycin, dihydrostreptomycin	GC-MS/MS method	-	LC/MS/MS confirmation 2025	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
7.	Lincosamides	Lincosamides: Lincomycin, Pirlimycin	GC-MS/MS method	-	LC/MS/MS confirmation 2026 tissue, eggs 2027 - milk	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.

(continue)

No.	Group index	Full technical specification required, Reference Standards	Method / Laboratory, contracted by ANSA	CRDV accredited methods/ matrix	Expansion planning / CRDV accreditation	Need for CRDV
8.	Pleuromutilins	Pleuromutilins: Tiamulin, 8-alpha- Hydroxy - mutilin, Valnemulin	GC-MS/MS method	-	LC/MS/MS confirmation 2026 – tissue, eggs 2027 - milk	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
9.	Amphenicols	Chloramphenicol, thiamphenicol, florfenicol	GC-MS/MS method	-	LC/MS/MS confirmation 2025 – tissue, eggs 2026 - milk	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
10.	Coccidiostats	Monensin, salinomycin, nicarbasin, lasalocid, narasin, maduramycin, robenidine, diclazuril, semduramycin, halofuginone, decoquinate, tolrazuril, aprinocide, clopidol	LC-MS/MS method	LC/MS/MS accredited Woven	Expansion eggs 2024	
11.	Anthelmintic	Avermectins: moxidectin, abamectin, doramectin, ivermectin, eprinomectin)	HPLC method	Accredited Tissue, milk Defective equipment	Reaccreditation (equipment) 2025-2026	HPLC equipment. Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
12.	Chloramphenicol	Chloramphenicol	ELISA	ELISA accredited. Tissue, milk, eggs, honey	LC/MS/MS confirmation 2025 – tissue, eggs 2026 - milk	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.
13.	Antibiotics	Tetracycline + 4-epi tetracycline (TC + epiTC), oxytetracycline + 4-epi oxytetracycline (OTC + epiOTC), chlortetracycline + 4-epi chlortetracycline (CTC + epiCTC), doxycycline (DC), Methacycline		LC/MS/MS accredited Tissue, milk, eggs,	Honey 2025 extension	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation
14.	Sulfanilamides	Sulfachlorpyridazine, sulfadiazine, sulfadimethoxine, sulfaguanidine, sulfamerazine, sulfamethazine, sulfamethizole, sulfamethoxypyridazine, sulfamethoxazole, sulfanilamide, sulfapyridine, sulfaquinoxaline, sulfathiazole, sulfisoxazole, Sulfacetamide, Sulfabenzamide Sulfadoxine, Sulfamonometoxin, Sulfamoxole, Sulfameter, Sulfaclosine, Sulfaetoxypyridazine, Suulfanitrane, Sulfisomidine;		ELISA - accredited Tissue, milk, eggs,	Honey 2024 extension	Internal and analytical standards. Consumables: cartridges, vials, filters - for method validation.

15.	Lactam	Betalactams (Amoxicillin, Ampicillin, Benzylpenicillin)	LC/MS/MS	LC/MS/MS accredited Tissue, milk, eggs	Extension of the group of substances - 2024	
					Honey 2024 extension	Internal and analytical standards. Consumables: cartridges, vials, filters – for method validation.
16.	Streptomycin	Streptomycin	ELISA	ELISA - accredited Tissue, milk, eggs, honey	LC/MS/MS accreditation 2025	
17.	Tetracycline honey	Tetracycline	ELISA		Honey 2025 extension	Internal and analytical standards. Consumables: cartridges, vials, filters – for method validation.
	Chlortetracycline honey	Chlortetracycline	ELISA			
	Oxytetracycline honey	Oxytetracycline	ELISA			
	Penicillin	Penicillin	ELISA			

Source: Elaborated by the authors based on ANSA and CRDV data

UNIDO Project Management Unit
National Food Safety Agency (ANSA)
Kogalniceanu 63
MD-2009 Chisinau
Republic of Moldova

+373 22 264 652

www.unido.org

unido@unido.org
r.cater@unido.org

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION