



CHEESE PRODUCTION AND EXPORT SUPPLY CHAIN

ARMENIA

IN PARTNERSHIP WITH



WORLD BANK GROUP

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2121 Pennsylvania Avenue, N.W.
Washington, D.C. 20433
Internet: www.ifc.org

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EXECUTIVE SUMMARY

Mapping of the cheese production and export supply chain has been implemented within the framework of the IFC Armenia Investment Climate Reform Project of the World Bank Group. The project aims to contribute to improving the country's investment climate and thereby attract investment into branches of its economy. One of the project's goals is to increase the investment attractiveness of several agribusiness branches and to promote the export and competitiveness of selected agricultural products by identifying issues in export supply chains and targeting interventions directed at addressing those issues. The Republic of Armenia Ministry of Economic Development and Investments has given priority to cheese production because of its great potential for export.

Mapping of the export supply chain of cheese aims to achieve the following:

1. Identify issues present in the cheese production (export) supply chain, including market imperfections and policy and regulatory obstacles;
2. Develop recommendations to resolve the problems or challenges so identified to improve the business and investment environment and to increase productivity and product competitiveness;
3. Contribute to enhancing the investment attractiveness of the cheese production sector.

For the mapping exercise, the supply chain and its effectiveness are viewed from a business perspective, including primary producers, exporters, retailers and wholesalers, processors, and transporters. In order to compile the necessary information, meetings and discussions were held with supply chain participants, including public and private stakeholders. Meetings were also held with international donor organizations active in the Armenian agribusiness sector in an effort to learn from their valuable experiences and views.¹

The review used local and international information sources, official statistical data, and local and international reviews and analytical materials pertaining to cheese production.²

This Executive Summary, which can also serve as a standalone document, summarizes key findings, along with recommendations to resolve the challenges. The following section on “Details of Cheese Production and Export Supply Chain” and the annexes present additional details regarding the cheese production and export supply chain.

1 The meetings took place from January to July 2017.

2 The list of used materials and sources is presented in annex 3.

A. KEY TRENDS AND ISSUES

Cheese production is one of the traditional sectors of the Armenian economy. The availability of highland pastures in Armenia allows for the production of high-quality milk and dairy products. Cheese production is a sector with both high production and export growth potential and is, therefore, potentially attractive to investors. Armenia produces more than two dozen types of various cheeses (cow, goat, sheep, and very small amounts of buffalo cheese), whereby 95 percent of the total production is cow cheese. Traditional cheeses include Lori, Chanakh, Bryndza, and Chechil. Other types of cheeses include Gouda, Emmental, Maasdam, Suluguni, and Mozzarella. There are as yet no Armenian cheeses with officially registered geographical indication (GI) or appellation of origin (AO).

The situation in the milk and cheese production sectors, as well as in the operation of the market of these products, has been conditioned by the prevalence of a large number of small, yet non-professional farmers and the lack of effective cooperation among farmers themselves and between farmers and cheese producers. Most of these small holdings do not possess or have poor knowledge and skills in the areas of animal management and care, milking practices, and milk hygiene and safety.

During the past decade, a number of important initiatives and changes in the dairy sector have set the stage for the beginning of transformation to a higher level of development of the sector. These included the following:

- ▲ Donor-supported initiatives aimed at the development of milk collection points or centers and milk marketing cooperatives contributed significantly to improving the milk supply in terms of quantity as well as quality of milk.
- ▲ The World Bank Group's Community Agricultural Resource Management and Competitiveness (CARMAC) project has undertaken significant works (during the recent five years, 2011-2016) toward improvement of pasture management in Armenia.
- ▲ To enhance farmer advisory and support services, Farm Service Centers (FSC) were introduced under CARMAC and other international donor-funded projects in various marzes of Armenia.
- ▲ Thousands of animals with high-quality genetics were imported to Armenia with government and donor assistance.

As indicated by businesses, in the recent five-year period, cheese production capacities increased by about two and a half. A dozen medium and large dairy (and cheese) production factories were established and/or enhanced. At the same time, there has been acceleration of technological enhancement of cheese production entities. A significant proportion of new medium and large production facilities are equipped with and operate modern, sophisticated technologies.

Armenia exports cheese to a number of countries, with the main export markets being the markets of Eurasian Economic Union (EEU) and the United States

(U.S.). In 2015 there was a sharp increase in cheese exports—from 1,500 metric tons in 2014 to 9,000 metric tons in 2015. In 2016, the export volume decreased to 5,500 metric tons, but still remained high.³ In effect, the EEU market provides unlimited export opportunities for Armenian cheese producers and exporters. At present, Armenian producers have a cost advantage in cheese production compared to producers in Russia (and Ukraine and Belarus).

The promotion of agricultural production and export is one of the priorities on the agenda of the Government of Armenia, as indicated in a number of strategic documents and programs. To encourage investments, the government introduced a value added tax (VAT) exemption in relation to imports of equipment used in cheese production.

In order to effectively utilize the opportunity for export expansion it is necessary, first, to expand the production capacity. Then, it is necessary to ensure competitiveness in terms of price and quality, and to plan and organize effectively the export process. To achieve this, the government and private business entities both face a number of challenges along the sector’s development path. It is important to note that there are differences between the challenges and opportunities faced by small and medium producers on one hand, and large producers on the other hand. To simplify, the differences (if any) due to sizes of producers are indicated under each issue discussed, instead of presenting them in separate sections. As more than 95 percent of the cheese produced in Armenia is cheese from cow milk, this report focuses on cow milk cheese.



Figure 1. Cheese production and export. Source: RA NSS

3 RA NSS, http://www.armstat.am/file/article/f_t-2015-10-nish-1.pdf

1. INSUFFICIENT QUANTITY, QUALITY, AND SEASONALITY OF MILK SUPPLY

Insufficient quantity and quality as well as large seasonal fluctuations in milk supply is one of the major binding constraints for further expansion and development of cheese production and export. The annual level of milk supply for processing is around 490,000 metric tons. The maximum volume is supplied during June-July (pasture grazing season). The difference between minimum and maximum supply levels may be up to ten times. The main underlying factors for drawbacks in milk supply include the following:

▲ Insufficient fodder and feed supply

- ▲ *Low level of fodder and feed production.* After a short period of grazing in pastures, cows' feeding regime changes drastically. The milk yield is therefore reduced due to the low nutritious value of animal feed. Fodder and feed production and silos' capacity is also underdeveloped in Armenia. The annual feed production is just 20,000-30,000 metric tons of combined feed, which is used not only for cattle husbandry, but also for poultry and other animals.⁴
- ▲ *Ineffective and inefficient use of pasture and grazing.* There is an abundance of alpine meadows in Armenia, which creates favorable conditions for producing high-quality cheeses. However, the competitiveness of animal husbandry suffers significantly due to the ineffective management of these pastures by community authorities and the lack or insufficiency of investments in pastures.

▲ Low milk yield

- ▲ The annual milk yield per cow in Armenia according to official statistics is 2,100 liters per cow.⁵ As indicated by businesses, in reality, the milk yield is around 1,500 liters per cow per year. This level of milk yield is low if compared internationally. The reasons for this include the following:
- ▲ *Poor genetic characteristics of animals.* There is a severe deficit of pure breed animals with high-quality characteristics. The efforts of the Government of Armenia and of international donor organizations contributed to an increase in the number of animals with high-quality genetics as well as to the promotion of the practice of artificial insemination in Armenia. However, the number of animals with high-quality genetics is far from sufficient. In addition, due to improper feeding and care, animals with high-quality genetics cannot provide high milk yields.
- ▲ *Ineffective animal husbandry practices.* Due to the lack of knowledge and skills among most farmers in animal management and reproduction,

4 RA NSS, «The volume of production of main products in industrial enterprises», 2016 <http://www.armstat.am/am/?nid=82&id=1740>

5 RA NSS

animal care/treatment and feeding, farm management, milking practices and hygiene practices leave much to be desired. Ineffective practices negatively affect milk yield, quality, and prices.

- △ *Poor veterinary services.* After the collapse of the Soviet farming and veterinary system, no system was formed and crystalized to fit the realities of Armenia. The role of the government is limited to anti-epidemic measures. Veterinary services, largely of low quality, are provided by private veterinarians. The establishment of FSCs in regions was a positive move to address this issue, but is still insufficient.
- △ *Inefficient import/export procedures.* There are import- and export-related regulations and procedures hindering the enhancement of competitiveness of animal husbandry and milk production in Armenia, in particular, customs procedures for importing equipment and machines and animals and genetic material. Businesses noted that the government's direct involvement in the importation and allocation of breeding animals distorts the market, although the intended objective of the government's effort is itself positive.

▲ **Market imperfections**

- △ *The prevalence of small holdings* and other peculiarities of the dairy market structure and its functioning in Armenia poses a number of challenges for businesses, which diminish the motivation of milk producers and processors to make investments and enhance the production technologies. This, in turn, limits the possibilities for sustained development of the sector.
- △ *Milk collection and storage infrastructure and logistical issues in milk supply:* The collection of milk from a large number of small milk collection centers located in different parts of the country causes additional logistical difficulties and costs. Activities geared toward promotion of the creation of milk collection centers and the establishment of milk producers' cooperatives played a very important positive role in tackling these issues, but is still not sufficient.
- △ *Issues in milk price formation.* Small milk producing holdings are unable to negotiate good prices for the raw milk because they have weak negotiating power in the market and a high dependency on milk processors. Moreover, processors often do not make payments in time for the milk they purchase, causing cash problems for milk producers. This results in diminished or vanished motivation among milk producers to invest in the expansion or enhancement of production.
- △ *Ineffective price-quality link in the market:* The current practice, whereby the price of milk is determined based mainly on fat content (ignoring protein content, microbiological contamination characteristics, content of somatic cells, antibiotics and other quality characteristics), leads to substantial deterioration of the quality of milk and dairy products in the market. Thus, the milk producer is not motivated to ensure good quality production or to invest in quality-enhancing technologies, in animals with high-quality genetics, or in quality feed.

- △ *The production and marketing of homemade cheeses (informal sector)* is considered to be one of the major factors affecting the functioning of milk and cheese markets. A large number of small holdings are involved in the production and sale of low-quality and cheap cheeses; these holdings exist outside of the taxation field. Informal small producers account for 72 percent of total cheese production. Businesses report that this practice negatively affects the price formation process in milk and cheese markets.
- △ *Milk powder importation:* There is widespread agreement among businesses that the importation of milk powder (especially of low quality) negatively affects the functioning of the local market and damages milk production. However, given the irregularity of the milk supply, production of dairy products would not be possible year around if milk powder is not used. The key issue is rather ensuring its quality and proper labeling of dairy products.

2. CHEESE PRODUCTION CAPACITY AND COMPETITIVENESS ISSUES

Another challenge facing further expansion and development of the cheese sector is the need to ensure a sufficient volume of cheese production and enhance the international competitiveness of cheese production. According to the Ministry of Agriculture, the current production capacities (excluding the informal sector) allow processing of 490,000 metric tons of milk, that is, at present the milk supply and processing capacity are equal. Under this circumstance, in order to avoid difficulties (and even failure) in the further expansion of cheese exportation, the expansion of processing capacities shall take place synchronously with the expansion of milk production. Important issues to be tackled in this regard, include the following:

- △ **Expansion of production volume/capacity**
 - △ The cheese production sector includes 50 registered enterprises and a large number of informal small holdings. More than 70 percent of total cheese production comes from the informal sector. Within the formal sector, the 10 largest producers represent around 90 percent of total formal production. In essence, formal and informal sectors compete for milk.
 - △ *Seasonality of production:* Unlike other dairy products, the high seasonality problem in cheese production cannot be alleviated by using milk powder. Usually, milk powder is not used for cheese production. The seasonality leads to a number of complexities in business management, such as in financial management, supply chain management (which is very important to become a reliable export partner), and logistics.
 - △ *Issues related to the importation of production lines, equipment, and tools:* As indicated by businesses, a number of problems in the import process discourage investments in the cheese sector and lower its competitiveness.

During customs formalities regarding importing milk processing complexes and equipment, the customs body often requires that parts be classified and cleared separately, rather than as a whole assembly. This results in changes to the customs and tax regimes applied to the commodity, leading to a considerable increase in customs duties and taxes. Additionally, the VAT privilege applied to the importation of investment goods does not apply to some equipment used in cheese production.

- △ *Factors impeding investments:* Businesses report that one of the factors impeding investment in the cheese sector is the administrative barriers related to setting out the necessary infrastructure. This is related particularly to the complex, lengthy, and costly administrative procedures that businesses face when trying to set up the electricity, water and gas supply lines for cheese production facilities. This topic is especially acute in the cheese sector, because for *small and medium cheese producers* it is important to locate their production facilities close to milk collection centers, and the latter often are in territories not equipped with electricity, water and gas supply lines.

▲ Cheese quality and safety

- △ *Low use of food safety systems and practices:* To increase product competitiveness and enter certain markets (in particular, the EU and EEU markets), there is a need to improve product quality and safety indicators. Armenian cheese production enterprises, especially *small and medium enterprises*, do not yet widely use internationally accepted production and hygiene practices such as HACCP (Hazard Analysis and Critical Control Points), Global GMP (Good Manufacturing Practice), Good Hygiene Practice (GHP), European Union (EU) requirements, and Codex Alimentarius standards. *Large cheese producers* utilize much better conditions and sophisticated production systems, however, they also do not widely apply GMP- and HACCP-based systems. The quality of cheeses produced in *small and medium enterprises* has deteriorated due to the low level of sophistication of technologies, ineffective selection of cheese types for production, insufficient investment, and the effort required for product grading, classification, and packaging activities.

- △ *Issues with conformity assessment/certification.* Business entities identified that the requirement to repeatedly undergo the conformity assessment (certification) procedures for every batch of cheese export, including laboratory testing, is a timely and costly procedure that impedes export.

▲ Price competitiveness

- △ *The challenge of reducing costs and enhancing productivity:* To enhance the international competitiveness of Armenian producers, it is vital to reduce costs and increase productivity. At present, Armenian cheese producers do have a cost advantage over their competitors in Russia (and Ukraine and Belarus). However, the costs may increase when, for the purposes of the

expansion of the cheese sector, investments are made to enhance production technologies and food safety systems.

- △ *Issues relating to the use of marketing and other business techniques to increase productivity:* For productivity growth, it is very important to ensure effective marketing, supply chain and distribution channel management, and other business techniques. Such effective techniques and practices are not widely applied by Armenian producers and exporters.
- △ *Taxation issues:* One of the problems in the cheese production sector is related to the application of VAT. The production and sale of milk, as a primary agricultural product, is exempt from VAT, while the production and sale of cheese is not VAT exempt. As a result, cheese producers, as they are unable to deduct the VAT included in the milk that they purchase, pay VAT on the whole value of the cheese. Businesses report that this issue is very acute in the cheese sector because milk cost represents over 70 percent of the total cost of cheese.
- ▲ **Weak business management practices**
 - △ The majority of cheese producers do not possess the business management knowledge and skills necessary to establish or operate a production system with advanced technologies, and lack knowledge of sophisticated marketing and export systems. This relates particularly to such practices as production planning, financial management, cost management, supply chain management, and marketing.

3. EFFECTIVE EXPORT STRATEGIES AND ORGANIZATION

With a view to production and export promotion, the Armenian cheese sector shall tackle the challenge of a lack of effective export strategies and issues related to export planning and organization of operations, including export logistics issues.

- ▲ **Product selection**
 - △ At present, the main types of exported cheeses include white, salted cheeses (Lori, Chanakh), and a number of yellow cheeses (particularly, Gouda). There is a need to invest in high-value production of cheeses enjoying demand in domestic and international markets, based on studies of international markets.
- ▲ **Foreign market entry and maintenance**
 - △ Russia and the United States are the main export markets for Armenian cheese exporters. The main consumers of Armenian cheeses in foreign markets are Armenians in the diaspora. At present, Armenian exporters can benefit broadly from the opportunities provided by EEU membership;

however, the competition in the Russian market is very intense. Armenian exporters must be prepared to compete with cheeses from Belarus, Ukraine (after resolution of political tensions), and from Europe entering the Russian market through various channels. It has to be noted that the dependency on one, even a very large, market is risky. Armenian businesses suffered from such a dependency very recently during the economic downturn in Russia in 2014-15.

▲ Export procedures and logistics

- △ *Export logistics issues:* One of the main logistical issues usually mentioned by Armenian exporters is that border crossing and customs formality procedures at the Georgian-Russian Lars border crossing point are complicated and unpredictable (which also include informal “facilitation fees”).
- △ Another export logistics issue, which becomes more acute due to the high seasonality of cheese production, is the lack of storage facilities and a distribution network in Russia, due to which a larger share of the profit is captured by middlemen.
- △ *Small and medium producers and exporters* often face logistical difficulties related to the formation of batches or lots. Due to small volumes, they are often unable to ensure a full load for a commercial truck and have to wait until the transportation company receives cargos from other businesses to achieve a full truck load.
- △ *EEU-related issues:* Along with expected export opportunities, EEU accession has brought some challenges. There are issues related particularly to the requirements and procedures for certification and veterinary inspection (certificates are required for each batch of imported and exported products). The implementation of food safety requirements will require the establishment of food safety systems; this, in turn, will require extra investment and staff training. Businesses report that there are burdensome procedures related to the application of VAT on products exported to the EEU market, such as the requirement to present documents proving the payment of VAT by their importing partner entity in Russia.

4. CHALLENGES WITH ACCESS TO FINANCE

The scarcity and low accessibility of financial recourses as well as the limited range of financing tools significantly constrain development of the cheese sector. Businesses of all sizes face difficulties in ensuring a sufficient amount of working capital and financing for investment.

▲ Availability and access to finance

- △ Long-term loans are necessary for the purchase, establishment, and operation of high-technology farms, improvement of pastures, organization

of fodder production, and the purchase of animals with high-quality genetics. Investments are inhibited by difficulties in accessing long-term financing and high interest rates for loans. Other financial resources—such as leasing, project financing, credit lines, and so forth—also are inaccessible.

▲ **Financial management**

- △ It is important to note that a considerable part of the problem of a lack of access to finance is due to weak financial management knowledge and skills among businesses.

5. WEAK HUMAN AND INSTITUTIONAL CAPACITY

The transformation of the cheese sector to a qualitatively higher level of development will require significant improvement of human and institutional capacities in milk, cheese, and related areas. Otherwise, sustained development of the cheese sector will be at risk.

▲ **Sector-specific and business knowledge and skills**

- △ There is a serious lack of knowledge about effective production technologies and practices throughout all the stages of dairy supply and the production chain, which significantly hinders the development of the dairy sector. This is related particularly to the lack of knowledge and skills in animal care and management, animal reproduction, farm management and milking practices, cheese production technologies, product quality, and safety management.
- △ In parallel, there is a lack of knowledge and skills in general business management, including production planning, financial management, supply chain management, marketing, etc.

▲ **Lack of animal identification system and inefficiency in data management**

- △ At present, there is some critical official statistical data, for instance, figures regarding milk yield, being questioned by business entities and professionals. In addition, in Armenia, there is no animal identification or registration and data management system, which significantly limits policy making capacity as well as traceability in the food chain.

▲ **Sector unions/associations and cooperatives**

- △ For many years, the culture of consumer cooperatives for the joint collection and sale of milk has existed in the milk production sector. This is definitely a positive move and contributed significantly to the development of milk production and collection technology, however it is still far from being sufficient for further development of the sector.
- △ The unions/associations functioning in the cheese sector are the Union of Cheese Producers-LARI and the Union of Dairy Producers. With their current capacities, the associations will be unable to fulfill their roles duly.

B. RECOMMENDATIONS

Issues to be tackled for development of the cheese sector and promotion of exports in Armenia shall be prioritized and grouped based on the issues and challenges identified above:

1. Tackling the issue of milk supply
2. Enhancing cheese production capacity
3. Strengthening human and institutional capacities
4. Enhancing export marketing and supply chain and practices
5. Tackling the issue of ensuring sufficient financial means for development

The cheese and milk sectors are interdependent sectors that complement and strengthen each other; therefore, they shall be reviewed together. To ensure sustained development of the cheese sector, it is critical that the expansion of processing capacities shall take place **synchronously** with the expansion of milk production. Further development of these sectors requires investments aimed at expanding the production capacity, enhancing technologies, developing knowledge and skills, and enhancing marketing. The cheese sector provides opportunities for investment projects involving private-private (milk producer-cheese producer) and public-private cooperation (e.g. establishment of dairy hubs, improvement of utility infrastructure).

At the current phase of development, it is important to effectively utilize the fact that there is a well-formed **nucleus of medium to large business entities**. This nucleus consisting of proactive and progressive entrepreneurs may become a locomotive of sector development; hence cooperation with them is necessary. These businesses may also be very effective partners in the accumulation of knowledge and its dissemination among small farmers and businesses and in the introduction of advanced production technologies and practices. In the sphere of export promotion, this nucleus can lead activities toward the development of competitive products and relevant standards, design and implementation of export strategies, logistics as well as effective marketing solutions.

1. TACKLING THE CHALLENGE OF MILK SUPPLY

To tackle the challenge of milk supply, the issues shall be prioritized and addressed based on the following:

- ▲ Ensuring sufficient feed/fodder supply
- ▲ Increasing milk yield
- ▲ Improving the operation of the market.

▲ Ensuring sufficient feed/fodder supply

- ▲ Investment is necessary in (a) fodder production; (b) feed preparation equipment; and (c) hydroponic feed production to ensure a year-around

supply of fresh, green feed for animals. It is important to identify effective feed crops (under the conditions in Armenia) and promote their mass production in cooperation with advanced farmers.

△ Improving pasture management and promoting investments in pasture to ensure the availability of electricity (via electricity lines and/or the use of solar panels) and water supply to pastures are necessary for effective milking operations in pastures. Investments in pastures can be encouraged by offering long-term rental agreements (for up to 10 years instead of 3 years) and improving renting procedures.

▲ **Increasing milk yield**

△ Disseminating knowledge and skills among farmers in animal management and reproduction (for instance, planning pregnancy time), animal care/treatment and feeding, farm management, milking practices and hygiene practices is important. Together with this, there is a need for promotion of veterinary advice and services (also see section 3 on “Strengthening Human and Institutional Capacities”).

△ Investment must be made in laboratory services to enhance feed testing services and ration development for animals.

△ Promotion of high-quality genetic animal breeding and investment in such animals, including such measures as the development and implementation of high standards for animal breeding, and support to capital and farm investment are critical. It is very important that the practice of chaotic animal reproduction is transformed into animal breeding based on professional knowledge and advice. To achieve this, it is necessary to provide professional state extension services and regulations in addition to private veterinary consultancy and services. In addition, for the transformation to the next phase of development of the cheese sector there will be a need for professional, medium to large animal farms which are capable of supplying sufficient volume of high quality milk to cheese producers.

▲ **Enhancing the effectiveness of the functioning of milk and cheese markets**

△ To improve the effectiveness of the milk market, there will be a need for investments in the establishment of milk collection centers. It will be appropriate to not only increase the number of milk collection centers, but also to make them larger and more sophisticated to ensure the effective development of the sector. Medium to large milk collection centers or, as they are called internationally “*dairy hubs*,” are more attractive for dairy/cheese producers since they ensure a stable supply of higher quality milk and are capable of providing a set of services and consultancy in relation to veterinary and animal husbandry. In this regard, dairy hubs represent a promising possibility in investment projects, involving cooperation between milk producers and processors as well as the public sector.

△ The establishment and promotion of high-quality milk production

standards (including milk powder) to help the market achieve effective price formation is critical. In parallel, there shall be also effective control of the milk quality at milk collection centers. An effective quality-price link in the market would provide incentives for farmers to produce better quality milk.

- △ The application and effective control of labeling requirements for dairy products is necessary: dairy producers shall clearly indicate on labels whether or not the product contains powdered milk and/or vegetable oils. This would allow for effective differentiation of products and price formation.
- △ It is critical to ensure effective and competitive import and export procedures and regimes such as customs and other procedures that are free of administrative barriers for the import of quality inputs, as well as VAT exemption on importation of equipment and inputs. This will help ensure the availability and accessibility of high-quality inputs for farmers, including high-quality semen and bulls, animals, feed and additives, equipment, and tools. Note that the VAT exemption does not apply to the importation of some equipment and machines used in dairy production, specifically, *to milking machines, milk processing equipment, feed preparation equipment*.
- △ The seasonality of milk production may benefit from the promotion of contract-based relationships between farmers and milk processors. Farmers can produce milk during the winter by purchasing more and better feed, but they prefer not to do so because in the absence of a contract, they are not confident that will be able to sell the milk at a good price.
- △ Stabilization of milk pricing should be assisted through government procurement, for instance, by purchasing it for use kindergartens, schools, and the military.

2. ENHANCING THE CHEESE PRODUCTION CAPACITY

To enhance cheese production capacities, the issues shall be prioritized and addressed based on the following:

- ▲ Promotion of investments in cheese production facilities
- ▲ Improvement of cheese quality and safety
- ▲ Enhancing productivity and price competitiveness

▲ Promotion of investments in cheese production facilities

- △ To maximize the effectiveness of investments, milk production and milk processing shall be viewed together, as a value chain, not separately. Otherwise, it would not be possible to solve the issues of quality, volume, and seasonality of milk and cheese production. This means that a complex or, as is often said, a cluster approach shall be applied, with the involvement of milk producers, milk collection cooperatives, milk processors, and animal breeding farms.

- △ An effective tool of investment promotion policy in the cheese production sector can be to offer tailor-made investment loans and grants for the establishment of high-tech milk collection and processing facilities, the introduction of energy efficient technologies, good practices, as well as the development of supporting facilities, such as cold storage facilities, sorting, packaging or other handling workshops. Such support may be provided to farms for capital investments, for instance, investments in farm enlargement and modernization, pasture improvement, cold storage facilities, milking and feed production facilities, and to build cheese production facilities.
- △ In individual cases, especially for the establishment of new, high-quality infrastructure by SMEs, the provision of partial grants and public-private partnerships (PPP) may serve as an effective instrument for the provision or construction of some essential infrastructure by the state (such as extension of electricity and gas distribution lines to the location of production facilities; this issue is especially critical in the cheese sector).
- △ It is necessary to design customs and tax formalities and procedures for the importation of production complexes and equipment, taking into consideration the specificities of the sector and the commodity, particularly (a) improvement of classification methods and procedures for production complexes and systems, devices, and other commodities used in milk and cheese production; and (b) extension of the exemption of importation of investment goods from VAT to include equipment used in milk and cheese production.
- ▲ **Improvement of cheese quality and safety**
 - △ To enhance the competitiveness of cheeses in local and international markets it is critical to widely implement proper safety and quality management systems and practices (HACCP, GMP, Codex Alimentarius standards, etc.) in Armenian milk and cheese production facilities.
 - △ It is necessary to simplify veterinary and conformity assessment procedures and documentary requirements in relation to the exportation of cheese.
- ▲ **Enhancing productivity and price competitiveness**
 - △ For milk and cheese production entities, it is critical to ensure that the right choice of technologies is made in terms of cost efficiency and productivity. There are about 10 cheese medium and large producers in Armenia equipped with advanced technologies. However, most of the *small and medium producers* need to significantly enhance their equipment and technologies.
 - △ For productivity growth, businesses should also apply effective marketing, supply chain and distribution channel management, and other business techniques. For instance, in parallel to cost reductions, productivity can be improved by making the right choice of cheese types to be marketed, that is,

select and produce the types of marketable cheeses and package and present/promote them appropriately to be able to command high prices both in domestic as well as international markets. Additionally, Armenian producers and exporters may improve productivity via the design and management of effective distribution networks in their export markets.

- △ In the context of price competitiveness, it is necessary to address the issue of the application of VAT in the dairy/cheese sector. A flexible taxation scheme shall be designed based on the peculiarities of cheese production. Consideration shall be given in particular to the fact that milk cost represents over 70 percent of the total cost of cheese.

3. STRENGTHENING HUMAN AND INSTITUTIONAL CAPACITIES

To strengthen human and institutional capacities, the issues shall be prioritized and addressed based on the following:

- ▲ Enhancement of sector specific and business knowledge, practices and technologies
- ▲ Establishment of animal identification and other data management systems
- ▲ Adoption of a sector development strategy
- ▲ Enhancement of cooperation and sector associations

▲ Sector specific and business knowledge and skills

- △ Ensuring the availability of people with knowledge and skills necessary for effective production and export is a vital precondition for the further development of the dairy/cheese sector.
- △ Considering that the development of an academic educational program by the Armenian National Agrarian University may take a long time, it is necessary to promptly develop professional training modules (jointly with the relevant professional organizations functioning in the sector) and to organize training of highly qualified technical professionals demanded by the sector's enterprises. Topics shall include the following in particular:
 - ▷ Animal care, feeding, and management
 - ▷ Modern, advanced milk and cheese production technologies
 - ▷ Product grading/sorting, packaging, storing, and transporting
 - ▷ Marketing and supply chain management
 - ▷ Good practices in farming and food production (GAP/GHP/GMP) and food safety management systems based on HACCP principles
 - ▷ Business management, including production planning, financial management, supply chain management, marketing.

- △ To enhance human capacity, it is critical to increase state financing and the effectiveness of its involvement in advisory and extension services.
- △ For the promotion of knowledge and skills, due attention shall be given to both the supply and demand sides. For the promotion of the supply of proper agriculture, business, and other advisory and veterinary services, there is an urgent need to deliver accessible, suitable, and practical courses or training. It would also be important to strengthen and effectively utilize the capacity of FSCs in regions. To promote demand for advisory and veterinary services, a subsidy may be provided to farmers to partially cover the payments for such services, on the condition of application of good animal husbandry practices.
- △ While designing state programs aimed at enhancing knowledge and skills, a key role shall be given to *medium to large cheese producers, input suppliers, and veterinarians as effective agents of knowledge accumulation and transfer*, since they have direct relations both with farmers of all sizes and worldwide producers of inputs.
- ▲ **Animal identification system and other data management systems**
 - △ The establishment of animal identification system will help ensure product traceability in the market, which is very important in many respects, including animal care, food safety, and quality, as well as the design and implementation of state support programs. It is critical to note that the establishment of such a system is not a one-time investment. Ensuring proper and sustained operation of such a system would require annual allocation of money in the state budget.
 - △ For effective design and implementation of milk and dairy sector development policies, there is a need for verification, clarification, and improvement of statistical data collection and processing about animal husbandry, milk, and dairy production. At present, there are a number of critical official statistical data being questioned by business entities and professionals.
- ▲ **Sector development strategy**
 - △ The cheese production sector is a part of the milk and dairy production industry; therefore, it is important to design *an integrated strategy for the development of the dairy sector*. Such an integrated strategy shall play a pivotal role for making the design and implementation of sector development investment programs, policies, and regulations more focused and effective. The development of such a strategy is in line with the Republic of Armenia (RA) Government Protocol Decision No. 49 of December 15, 2011 under which dairy production is included in the list of priority sectors for export promotion.
 - △ To select effective strategies, it is important to carry out awareness raising activities among businesses and public agencies. There is a need to study

EEU requirements and procedures and educate the representatives of the public and private sectors about them. Awareness raising is also needed about government programs to promote exports, for example, the export insurance program, and the import procedures for investment complexes and equipment.

▲ **Cooperation and sector associations**

- ▲ Promotion of cooperation between economic entities engaged in the milk/cheese sector is important particularly for defining and meeting product safety and quality standards, branding, as well as for collecting (accumulating) and packaging products for export. An effective way to promote cooperation is to link it to investment projects, specifically those investment projects that foster the cooperation between milk producers and cheese producers to improve the functioning of the dairy market.
- ▲ Sector associations, particularly, Lari Union of Cheese Producers and the Union of Dairy Producers, need serious enhancement in order to be able to contribute significantly to the development of the sector.

4. ENHANCEMENT OF EXPORT MARKETING AND SUPPLY CHAIN STRATEGIES

For the implementation of effective export strategies and tools, the issues shall be prioritized and addressed based on the following:

- ▲ Choosing the right product
- ▲ Choosing and maintaining the right market
- ▲ Marketing tools and logistics

▲ **Choosing the right product**

- ▲ To enter new markets and enhance competitiveness in the existing and new markets, the selection and packaging or other introduction of appropriate types of cheeses shall be prioritized. There is a need to invest in high-value production of cheeses enjoying demand in internal and international markets, based on studies of international markets. For instance, it is necessary to take into account that consumers in the Russian market prefer so-called “European cheeses”, to give attention to proper branding of Armenian cheeses, and to identify the types of cheeses demanded in the Middle Eastern markets.
- ▲ While selecting the cheese type, consideration shall be given also to logistical issues. Thus, cheeses with long expiry dates may be preferable, bearing in mind the transportation difficulties faced by Armenian businesses.

▲ **Choosing and maintaining the right market**

- ▲ In order to avoid problems of dependency on one market, it is very important

to give due consideration to searching and entering new markets as well as new segments (other than diaspora Armenians) in the existing markets. Armenian enterprises should consider enhancing the competitiveness of their production, in terms of cost efficiency as well as increasing product variety and quality. In addition to the Russian and US markets, Middle Eastern countries also can be viewed as a potential market given that a “Halal” certification center was recently established in Armenia.

▲ Procedures and logistics

- ▲ Given Armenia’s geographical location, it is very important that businesses themselves adopt farsighted and provident supply chain strategies. For instance, in the event of a possible close down of the Lars border, challenges to crossing could be reduced or overcome through effective organization of export logistics, including accurate forecast and planning of future sales volumes. Armenian businesses could also *consider jointly establishing or utilizing storage facilities* in export markets located near their main trade partner locations.
- ▲ To benefit from wide export opportunities effectively, *small and medium* cheese producers need to *join their marketing efforts and capacities* both for the acquisition of inputs and for marketing of products. For this, businesses must improve their knowledge and skills in such areas as marketing, supply chain management, food safety, standardization of production techniques, and products.
- ▲ Continued collaboration and agreements with the relevant Russian and Georgian authorities on issues related to maintaining clarity and consistency of the procedure applied at the Lars border crossing point is necessary. It is important to identify alternative import/export transportation routes other than the route through Lars, making the arrangements necessary for effective utilization of those routes (for instance, the routes through Black Sea ports).

5. TACKLING THE ISSUE OF ENSURING FINANCIAL MEANS FOR DEVELOPMENT

To tackle the challenge of access to finance, issues shall be addressed based on the following:

- ▲ Developing effective, tailor-made financial products
- ▲ Enhancing knowledge in financial management
- ▲ General financial sector development

▲ Developing more effective, tailor-made financial products

- ▲ To improve access to finance for business generation and development, attention shall be focused on helping the financial institutions develop more

effective, tailor-made financial products to meet the needs of private businesses. The banks shall be encouraged to work very closely with the business community to identify their real needs and design clear and simple procedures for providing loans to businesses.

- △ Policy measures can be designed to encourage banks to finance the types of business projects that contribute to the development of the sector, for example, (a) projects to promote the development of market and production infrastructures such as storage and processing facilities; and (b) investments in technological development, export promotion, (c) utilization of effective export financing, international payment mechanisms. It is important to inform businesses about possibilities of export insurance, in particular, about the Export Insurance Agency of Armenia and its activities.

▲ **Enhancing knowledge in financial management**

- △ It is critical to address the issue of financial and business management literacy, for instance, through tailor-made practical training sessions for banks and businesses, on one hand to enable banks to understand the challenges and needs of businesses and, on the other hand, so that businesses understand the importance of financial management and its tools as well as the requirements and procedures of banks for financing. For instance, the SME Development National Center of Armenia offers useful courses for businesses.

▲ **General financial sector development**

- △ In the long term, policies shall focus on facilitating the development of non-debt financing mechanisms, such as seed funds, venture funds, equity finds, and capital markets.

DETAILS OF CHEESE PRODUCTION AND EXPORT SUPPLY CHAIN

The mapping exercise considers the chain and its efficiency from the business perspective – farmers, milk producers or importers, cheese (and other dairy product) producers, exporters, retailers and wholesalers, processors, freight forwarders, etc. Export chains include both pre-production, that is, chains of obtaining (or importing) raw materials and relevant permits, and post-production chains, such as product shipment, packaging, storing, and export related procedures. See the diagram of the cheese production and chain in Figure 7.

1. BRIEF INFORMATION ABOUT THE CHEESE SECTOR

Cheese production is one of the traditional sectors of the Armenian economy. Armenia produces and exports more than two dozen types of cheeses (Table 1 and Figure 2). Most of the cheeses produced in Armenia are from cow milk. Traditional types of cheeses include Lori, Chanakh, Chechil. Together with traditional cheeses there is increasing production of such cheeses as Gouda, Edam, Cheddar, Camembert, Emmental.⁶

Cheese production is a sector with high export growth potential. In 2016, annual production volume, according to official statistics, was 22,316 metric tons (Figure 2), which is by 30 percent higher than the production in 2010.⁷ Note that since 2010 changes in terms of production volume were not significant, but in 2016 there was a significant increase in production – by 20 percent compared to 2015.

According to the RA NSS, there are 81 enterprises operating in the milk processing (dairy) sector, of which 50 enterprises are engaged in cheese production.⁸

According to the estimate of the Ministry of Agriculture, current production capacities allow processing of 490,000 metric tons of milk. The dairy industry employs around 1,900 staff involved in production.⁹

These numbers do not include the large number of small homemade cheese producing holdings.

6 By memory from Soviet times, many yellow cheeses such as Gouda, Edam, Maasdam, and, sometimes, even Emmental were called “Holland (Dutch) cheeses”.

7 RA NSS, Reports on Production of Industrial Enterprises. Businesses and professionals in the sector report that milk and cheese production volumes are significantly less than this number.

8 Large producers include, particularly: “Ashtarak kat” CJSC, “Dustr Marianna”, “Bonilat”, “Multi-agro” scientific-production center”, “Arzni kat”, “Tamara & Ani”, “Biokat”, “Chanakh”, “Dustr Melania”, “Igit” Ltds, “Araks-2” Production complex, “Marila”.

9 Reference to the Ministry of Agriculture website (last accessed February 16, 2017).

Unlike trends in cheese production, export of cheese demonstrates dynamic growth trends. During 2010-2014 export of cheese increased by more than three times. In 2015 there was a sharp increase of cheese export: it increased six times compared to the previous year (from 1,500 in 2014 to 9,000 metric tons in 2015).

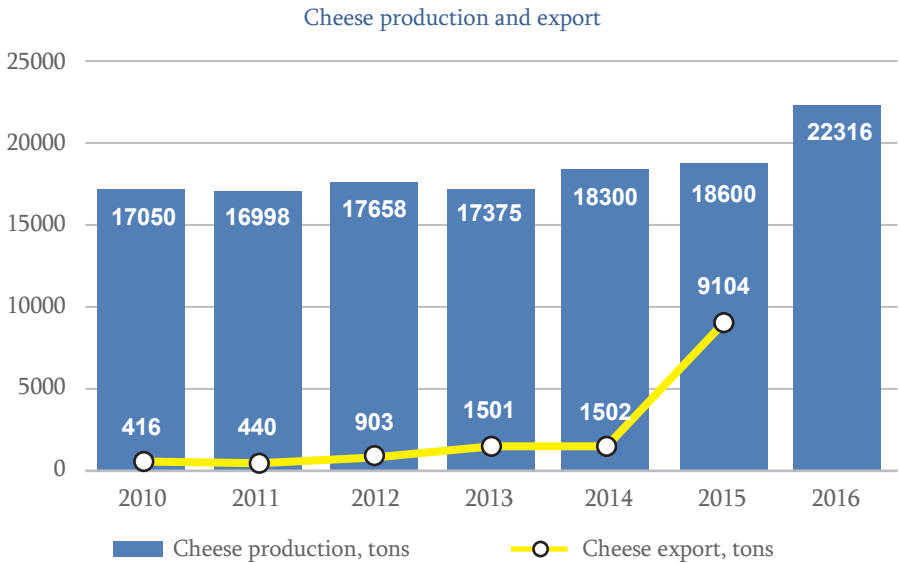


Figure 2. Cheese production and export. Source: RA NSS

Such a sharp increase in exports was possibly conditioned by such factors as Armenia’s accession to the EEU and the application of economic sanctions against Russia. The combination of these two factors creates broad opportunities for export to Russia. In 2015, 42 percent of cheese exports were of white salty cow cheese, while 17.5 percent were of Gouda cheese. There was a sharp increase in exports of both traditional white cheeses (Lori, Chanakh) and yellow firm or semi-firm cheeses (Gouda, Cheddar, Edam, Emmental, Tilzit).

Broad export opportunities are accompanied by corresponding challenges; tackling these challenges is vital for the further development of the cheese sector. There are challenges across all the stages of the cheese production and export supply chain. The following sections discuss in detail the opportunities and challenges corresponding to various stages and processes of cheese production and the supply chain, including:

- ▲ Low quality of animals and low milk yield
- ▲ Inefficiencies in animal feeding, care and treatment
- ▲ High seasonality and wide fluctuations in milk supply during the year
- ▲ Low quality of milk and improper milking and milk treatment/storage hygiene conditions

- ⤴ Imperfections in market functioning, including animal, milk and cheese markets
- ⤴ Issues related to cheese quality and safety standards
- ⤴ Institutional issues such as: the lack of animal identification, insufficiency of veterinary services, lack of traceability of products (and subproducts), poor extension and other agricultural services.

ARMENIA CHEESE SECTOR – SWOT ANALYSIS

STRENGTHS

- ▲ Availability of pastures for producing good quality milk
- ▲ Being a traditional sector – availability of cheese making knowledge and skills
- ▲ Positive reputation on traditional markets in Russia and other CIS countries
- ▲ Improvement of milk collection technology in recent years (milk collection centers, milking equipment, etc.)

WEAKNESSES

- ▲ Lack of sector development strategy
- ▲ Insufficient volume and irregularity of good feed and fodder supply which limits the further growth of the sector
- ▲ High seasonality, insufficient volume of good quality milk supply which limits the further growth of the sector
- ▲ Limited cheese production capacity (insufficient for sector growth)
- ▲ Shortage of specialists/professionals (in veterinary, animal husbandry, milk production and processing, cheese production technologies)
- ▲ Low accessibility of investment and financial resources
- ▲ Poor marketing in terms of (a) exportable cheese types and market penetration; (b) lack of control of distribution networks in export markets (as a result of which the largest part of profit is captured by intermediaries)
- ▲ Lack or insufficiency of production quality and safety control systems
- ▲ Burdensome import procedures
- ▲ Imperfections of the educational system (inability to prepare high quality specialists)
- ▲ Imperfections in the relevant legislation (and in the implementation of the legislation)

OPPORTUNITIES

- ▲ Production of new types of cheeses demanded in export markets
- ▲ Availability of the Russian traditional export market (increased opportunities under economic sanctions against Russia)
- ▲ Opportunity of entering into new export markets (for instance, Middle eastern markets)
- ▲ Favorable conditions for investments (import of production complexes and equipment exempted from VAT)

THREATS

- ▲ High dependence on one market – Russian market
- ▲ Entry of Iran into the Russian market (after lifting economic sanctions against Iran)
- ▲ Intensification of competition in the traditional Russian market – entry or strengthening of positions of foreign competitors in the Russian market
- ▲ Possible more stringent quality and safety requirements in traditional and other markets
- ▲ Traditional cheese types not meeting preferences of consumers in foreign markets

2. MILK PRODUCTION

The timely supply of milk of required quality and quantity is a necessary precondition for cheese production. In Armenia, 95 percent of total cheese production is of cow cheese. In 2015, the volume of milk production was 728,600 metric tons, and imports of dairy products (expressed as milk equivalent), 132,600 metric tons. The import of only milk powder and condensed milk was 3,828.5 metric tons, and of milk and cream was 155.2 metric tons. According to RA NSS, during the recent five-year period, the volume of cheese production has increased steadily (Figure 3).

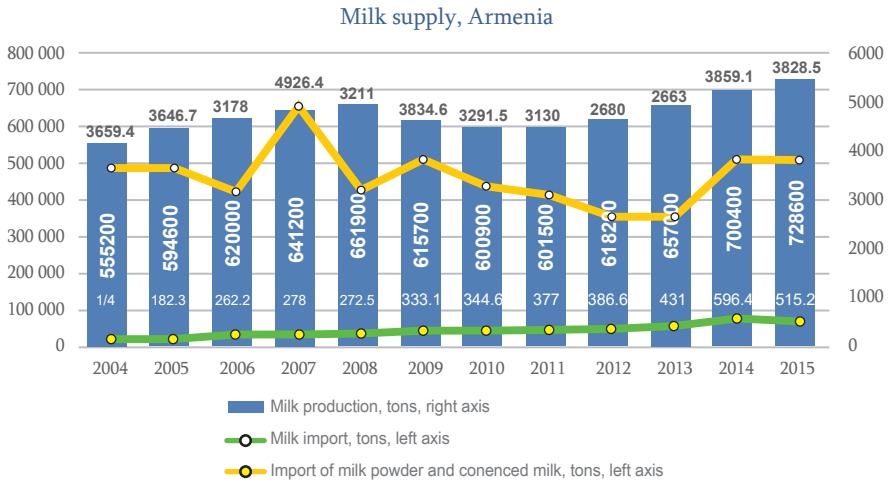


Figure 3. Milk supply. Source: RA NSS

In Armenia, one of the main constraints to further expansion of cheese production is the highly seasonal nature and limited volume and fluctuations in milk supply throughout the year (Figure 4). The maximum amount of milk is produced in the months of June to July. The difference between the maximum and minimum supply volumes may be tenfold. The reasons for such seasonality and fluctuations include:

- ▲ The fact that the vast majority of farmers are small holdings (with three to four cows), which take animals to remote pastures for grazing during spring and summer.
- ▲ Inefficient practices in feed production, supply, and management, due to which the quality and nutritious value of feed deteriorate significantly after the spring and summer seasons. For more details, see Section 2.1.

Milk supply fluctuations cause a number of difficulties for cheese and other dairy producers, specifically:

- ▲ Difficulties in stable production planning and organization

- ▲ Logistical problems in storage and transportation
- ▲ Difficulties related to financial management. As a rule, a significant part of milk processors suffer from a scarcity of working capital and an inability to make timely payments for the purchased milk.

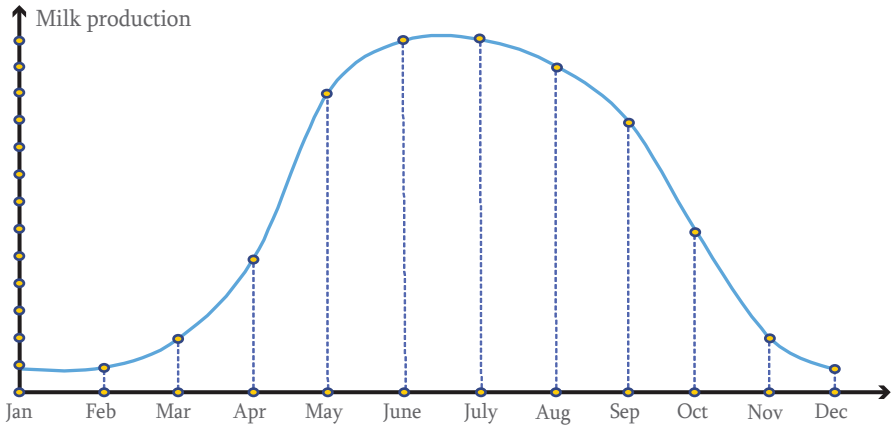


Figure 4. Seasonal fluctuations of milk supply

Another characteristic of milk production in Armenia, which impedes the development of cheese production and deteriorates the competitiveness of cheese in domestic and, especially, foreign markets, is the low quality of milk and poor hygiene practices.

The majority of the problems mentioned above are related to the prevalence of small holdings and the lack or weakness of cooperation between them, due to which:

- ▲ Milk collection logistics is complicated: it is difficult and costly to collect milk from a large number of small milk producers, which increases the total cost of milk.
- ▲ There are problems in defining and implementing proper milk quality and safety standards (this issue appears in many other, even developed, countries). Low-quality milk, of course, negatively affects the quality of cheese.

As reported by RA NSS, in 2015 the level of self-sufficiency in milk was 84.2 percent, that is, 84.2 percent of milk consumed or processed in Armenia is produced domestically, while 15 percent is imported (mostly milk powder and condensed milk).¹⁰

Due to the peculiarities of the Armenian environment, the average level of marketability of milk is 60 percent, that is, rural holdings (households) sell 60 percent

¹⁰ RA NSS, Food Security and Poverty, January-December 2015; http://www.armstat.am/file/article/f_sec_4_2015_3.pdf

of the milk they produce, while the remaining 40 percent of production is consumed or processed by holdings themselves.¹¹ In other words, at present, the milk processing capacity, without own processing by rural holdings, is 450 metric tons annually (including all dairy products), plus the capacity necessary for processing the imported milk powder or condensed milk.¹²

Development of milk production should not be viewed separately from milk processing. It is important to link further development of milk production with development of the capacities of dairy, particularly cheese production and export. Business entities shall be able to sell their produce at profitable prices. Bearing in mind that the main customers for milk are milk processors, it is not reasonable to increase milk yield and milk production without having sufficient capacities for milk processing.

2.1. PASTURE AND FEED MANAGEMENT

High-quality milk production and stable supply requires good quality feed with appropriate ingredients throughout the year. In Armenia, the further development and expansion of milk production is constrained by imperfections in feed supply and feeding practices.

The problems in feed production and management became more apparent, when high-quality pure breed animals, imported under the government program to develop cattle breeding, and their cross-breeds performed significantly weaker than expected in terms of milk yield. The reasons for this were the low quality of feed, poor feeding practices, and poor animal care or management. Animal performance was also affected by the feeding stress that animals faced due to high seasonality of feed production (there is insufficiency of feed and fodder production as well as of storage facilities in Armenia). High-quality animals require proper feed and feeding in order to be able to perform at their maximum capability.

Feeding practices and culture

Feeding directly affects the milk yield of animals. The main feeding practices in Armenia are:

- ▲ Pasture feeding, when animals are fed with green grass in remote pastures during a short season (second half of spring and summer)
- ▲ Farm housing and feeding, when animals are kept in barns and fed with stored, dry grass the quality of which is far from ideal. The harvested grass is stored under open sky and precipitation due to which it loses its nutritious value.

Some farmers feed animals also with silo and combined (concentrated) feed;

11 RA NSS, “The realization (use) of agricultural production by agricultural households”, 2015 http://www.armstat.am/file/article/iracum_2015.pdf

12 In 2015, the production of milk in Armenia was 728,600 metric tons, of which 60 percent of total production (437.2 metric tons) was consumed and processed in Armenia, excluding own consumption and processing by households.

however, this feeding practice is not widely applied by farmers.

The majority of farmers do not apply effective feeding regimes and rations, due to the lack of feed laboratories, lack of feed preparation machines and equipment (e.g. for silos), and lack of knowledge and skills in good feeding management.

Overall, there is lack of knowledge and skills in such important areas as feed crop rotation, GAP, fertilization with manure, good grass harvesting techniques, good land management practices, and animal management (e.g. animal feeding, animal transfer). Unlike smallholders, large farmers do have a relatively higher level of knowledge. For examples of ineffective feeding practices see Box 1.

Box 1. Inefficient feeding practices

1. Farmers often tend to cut hay at late stages of development to increase mass production, due to which the content of good substances (e.g., cellulose, digestible proteins, carbohydrates, fat, vitamins, etc.) is reduced and replaced by indigestible substances (e.g., lignin). The consequence is a reduction of oxygen in the cow's diet that negatively affects the milk yield.
2. Farmers usually give feed to animals only at specific times during the day (e.g., morning and evening), but it is an ineffective practice because animals compete for the feed and large cows steal the feed from the small and young cows. The effect is a reduction of production by the cows that received less feed. Good management practice suggests that animals have access to feed all day whenever they wish.
3. Another example of ineffective practice is when cows of different ages, sizes, and diet levels are put together. Milking cows, dry cows, and pregnant cows need different types of diets and for this reason should be kept separately.

Feeding practices are affected by the existing imperfections in milk and cheese markets, leading to instability and low milk prices. For instance, farmers often avoid incurring additional costs for feed because they are not confident that they will be able to charge a good price for the milk and that the good quality of their product will ensure a good price in the market. As farmers may incur losses due to additional costs for high-quality feed, they often prefer underfeeding their animals (feeding less than the optimal amount), which in turn leads to low productivity of the animals.

Feed production in Armenia is still underdeveloped. According to estimates from the Ministry of Agriculture, the annual production of combined (concentrated) feed is 20,000 to 30,000 metric tons. This amount of feed is used not only for feeding cattle, but also for poultry and other animals. In addition, the annual production of husk and other remains from processing of cereals was 88,000 metric

tons in 2016,¹³ although they have substantially lower nutritious characteristics compared to concentrated feed. During the past five years, annual import of prepared animal feed to Armenia was less than 14,000 metric tons (Table1). During this period there was no any notable trend in feed imports.

Table 1. Armenia production and import of animal feeds

	2012	2013	2014	2015	2016
Husk and other remains from processing of cereals, metric tons ¹⁴	90,330	81,304	100,290	87,660	87,422
<i>Import, metric tons¹⁵</i>	13,115	12,663	11,780	12,440	

Source: RA NSS

Pasture management

Poor pasture management is another issue that negatively affects feeding practices. Armenia is abundant with highland alpine meadows, which creates favorable conditions for production of high-quality cheeses. Pastures belong to communities and are managed by community authorities, who have the authority to rent out pastures to private entities. Private entities report that pasture renting and rent extension procedures are not clear and often give room to discretionary decision making by community authorities to the detriment of private entities.

Box 2. World Bank CARMAC Project

The World Bank’s Community Agriculture Resource Management and Competitiveness (CARMAC) project was implemented in 2011-2016. The project included a Community Pasture/Livestock Management System component, which aimed to introduce efficient and sustainable community-managed pasture/fodder-based livestock production systems in selected mountainous communities, where livestock was the main source of livelihood and communities had expressed a strong interest in improving their pasture production. This required reversing the trend of destructive grazing, implementing more efficient pasture use, improving systems of fodder production and animal feeding, and raising the efficiency of animal production.

13 RA NSS “Physical volume of production of main product types by industrial enterprises, 2017 http://www.armstat.am/file/article/bnexen_12_2016.pdf

14 RA NSS “Physical volume of production of main product types by industrial enterprises, 2017, annual reports. http://www.armstat.am/file/article/bnexen_12_2016.pdf

15 Import figures do not include feed for pets (cas, dogs). They include products under tariff subheading 390990 (under EEU commodity classification nomenclature). RA NSS Annual Reports on Foreign Trade (at 8-digit level, and 10-digit level for 2015), <http://www.armstat.am/am/?nid=82&id=1793>

It is worth noting that the CARMAC project applied a comprehensive approach in relation to the milk supply chain and covered pasture improvement and management. Under the CARMAC project, Pasture Users Associations (PUAs) Consumer Cooperatives were established based on the Law on Consumer Cooperatives in over 91 communities and were given responsibilities for sustainable use and management of pasture resources. The subsequent CARMAC-2 project continued these efforts. It is envisioned that the number of communities engaged will be over 180. Pasture use and management responsibilities were transferred to cooperatives by communities through agreements signed between the two parties. These two projects provided technical assistance to cooperatives to improve their capacity for good pasture management.

The communities were supported with infrastructure improvements such as pasture watering systems, roads, barns, and shelters for shepherds. Cooperatives have been equipped with agricultural machinery and equipment—tractors, ploughs, and drills among others—to reduce the communities' dependence on external procurement of animal feed. In parallel, the cooperatives received support for the establishment of milk collection and cooling centers.

The results attributed to the CARMAC project include the following:

- ▲ About 176,000 hectares of previously unused or underused pastures have been equipped with watering points, which reduced pressures from animal grazing on more degraded pastures elsewhere
- ▲ Cattle milk productivity in the communities under the Project increased by about 137 percent
- ▲ Cattle weight gains increased by about 127 percent
- ▲ Pasture use fees collected by communities increased by about 200 percent
- ▲ The value of livestock product sales increased by 268 percent.

There are very little or no investments in pastures, and pasture management is weak. Most pastures have no access to electricity supply, water, and pasture watering systems, which impedes the optimal feeding of animals and proper milking processes. Roads to pastures are also in very bad condition, causing stress to animals. Some ways to improve pastures include (a) pasture rotation, (b) fertilization of pastures with manure, and (c) the right selection of fodder crops, such as cold resistant crops.

Considerable works have been undertaken to improve pastures under the World Bank's Community Agriculture Resource Management and Competitiveness (CARMAC) project (Box 2).

2.2. ANIMALS

Animals and genetics

The use of animals with high-quality genetics is an essential factor for milk production and animal husbandry in general. The main breed present in Armenia is the Caucasian Brown cattle. During recent years, within the framework of government and private projects, Armenia imported cattle of a number of pure breeds such as Holstein, Swiss, and Simental.

According to the Ministry of Agriculture, there are about 10 entities involved in cattle breeding and 170,000 holdings involved in animal husbandry. For purposes of improving cattle genetics, the government supports the import of high-quality pure breeds within the framework of the Program for the Development of Cattle Breeding. In addition, a number of projects geared toward the improvement of cattle genetics and promotion of artificial insemination have been financed and implemented by international donor organizations.

However, there is low availability and accessibility of quality animals with high performance for private entities. There are, therefore, scarce possibilities for farmers to crossbreed their animals with pure breeds to improve the genetic characteristics of their animals. At present, the government (with donor assistance) imports pure breeds and sells them to private farms. The market of these animals is not free, and *small and medium holdings* cannot afford to import such high-quality breeds.

There is a significant lack of knowledge and skills in animal breeding. Artificial insemination (AI) services have been promoted through a number of projects; however, AI is not yet widespread throughout the country. For reproduction purposes, the majority of farmers tend to use old, traditional and ineffective techniques with the use of local reproduction bulls.

In order to ensure the availability of high-quality and productive animals it is very important to have a well-designed selection plan in which resistance to harsh environments is included in the breeding goals.

2.3. ANIMAL MANAGEMENT, TREATMENT/CARE AND HEALTH

Animal care and treatment

In the lowland regions of Armenia, animals are kept and fed in farms (barns) all year round, while in highlands, farmers apply a combination of pasture feeding and in-farm feeding. The largest share of cattle herd is concentrated in Gegharkunik and Shirak regions, followed by Aragatsotn, Syunik, and Lori regions.

Milk production is carried out mainly by smallholders with 3 to 5 cattle on average. The fragmented nature of milk production leads to a number of problems

that impede the development of the sector. There are problems related particularly to the effective transfer of knowledge and skills, accessibility of good quality inputs for production, management of the seasonality of milk production, disease control, and the poor negotiating position of smallholders in the markets.

In most of the small farms in Armenia, the housing conditions of animals are very poor, which causes various health problems among animals and deteriorates their performance. Farms (barns or stalls) are poorly designed, usually are closed and have very little light and air circulation, and are not cleaned and maintained properly. This situation has a number of negative consequences: (i) it subjects the animals to stress; (ii) it very often creates favorable conditions for various diseases; and (iii) it does not facilitate implementation of the sound production operations necessary to ensure adequate levels of food safety and hygiene of the milk.

The international experience suggests that cow milk yield can be approved by at least 20-40 percent only through application of good animal care and management practices.

Table 2. The presence of infectious animal diseases

	2015	2016
TOTAL number of animals		
Cattle, of which:	688,553	701,535
Cows	79,305	161,448
Sheep and goats	56,174	2,766
Pigs	142,432	174,776
Number of animals infected with brucellosis		
Cattle	1,048	1,221
Sheep and goats	609	738
Pigs	-	-
Horses	-	-

Source: RA, NSS, http://www.armstat.am/file/article/f_sec_4_2016_3.pdf

Animal health

As an element of its general services in agriculture, the government finances programs for animal healthcare, particularly programs relating to epidemic control. Every year an “Agricultural Animal Vaccination Program” is implemented with state funding. This program aims to properly diagnose and prevent certain animal diseases. The only type of infectious animal disease present in Armenia is tuberculosis (table 2). Armenia is free of other infectious diseases such as anthrax, tuberculosis, and A, O and Asian Murrain.

While these healthcare programs are critical to prevent disease outbreaks, farmers report that improper management of the vaccination process may have negative effects on animal husbandry. For instance, stakeholders noted issues related to poorly managed timing of vaccination. Specifically, veterinarians sometimes do vaccinations when cows are pregnant, which leads to the need to abort the pregnancy. This could be avoided if the process is properly managed and conducted.

2.4. MILKING PRACTICES AND EQUIPMENT

Milk production is carried out mainly in smallholders (with three to five cows on average). The prevalence of small, fragmented farm holdings leads to issues related to the collection of milk and ensuring good quality and consistency of the quality of milk. There is a lack of knowledge among farmers about good animal husbandry, milking, and food safety practices.

A number of recent initiatives aimed at the development of milk collection centers and milk marketing cooperatives have been a very important move toward addressing issues related to the collection and quality of milk. However, poor feeding, animal care, and milking practices are still prevalent in the Armenian milk production sector, leading to low productivity (Table 3) and low quality of milk.

Milking by hand is one of the main sources of contamination and is responsible for spreading diseases among animals and humans (e.g., mastitis, brucellosis, etc.). One solution is to move from hand milking to portable milking machines.

In this regard, it is important to assist smallholders that want to buy and use portable milking machines. Today, these machines are not expensive, and the costs can be further reduced if a machine is shared among a few smallholders from the same village.

2.5. MILK YIELD

For further development of the cheese production sector it is critical, among other things, to increase the milk yield per cow. In Armenia, the level of milk yield per cow remains low. The annual milk yield per cow in Armenia (according to RA NSS)

Table 3. International comparison of cow milk yield, 2014

Country	l/cow per year
Israel	12,688
Czech Republic	7,913
Germany	7,541
Italy	6,032
Ukraine	4,509
Belarus	4,387
Russia	4,030
Turkey	3,030
Iran	2,781
Armenia	2,061
Kyrgyz Republic	1,895
Kazakhstan	1,770
Azerbaijan	1,401
Georgia	1,008

is 2,100 liters per cow, which is a low if compared internationally (Table 3).¹⁶ As indicated by businesses, in reality the milk yield is even lower—around 1,500 liters per cow per year. Based on data from the Food and Agriculture Organization (FAO), in 2014 Armenia ranked 81 among 198 countries in terms of milk yield per cow.

2.6. MILK COLLECTION, STORAGE AND TRANSPORTATION EQUIPMENT

An essential factor for ensuring food safety and quality is the implementation of effective quality control at milk collection centers. The market shelf life of milk is negatively affected by the contamination of milk (by such substances as manure, somatic cells, antibiotics, hormones, soda, and so on), as well as by the lack of cold transportation and storage chain.

It is crucial that milk collection centers be equipped with devices and tools for testing the content and characteristics of milk. One way to encourage the proper equipment of milk collection centers is to provide assistance with purchasing the devices and tools if the participants in the market agree to set the price of milk based not only on quantity, but also on the quality characteristics of milk.

Import of complexes and equipment

Armenia imports technologically advanced animal husbandry, milk production, and processing complexes, equipment, and tools. Therefore, to promote investments in the sector, it is necessary to simplify and facilitate import procedures and requirements. Currently, there is a need for clarification of the relevant regulations and laws with respect to definitions or classifications of complexes and equipment, as well as related customs and tax procedures. A number of important regulatory and procedural issues related to import are discussed below.

The import of pure breed animals (including cattle, goat, and sheep) and some equipment (milk collection equipment, milk separators) is VAT exempt.¹⁷ It is an important change, which, if enforced effectively, may spur investments and positively affect the agri-production sector's development. Economic entities report that during customs formalities when importing milk or cheese production complexes and equipment, the customs body often requires that they be classified and cleared separately, rather than as a whole assembly. This approach results in changing the customs classification code of the commodity and the customs and tax regimes applied to the commodity, leading to considerable increases in customs duties and taxes. Note that the VAT exemption does not apply to some equipment and machines used in dairy production, specifically, *to milking machines, milk*

16 RA NSS

17 “RA Law on Approval of List of Goods Imported by Organizations and Private Entrepreneurs which are Exempt from Excise Tax, and the Importation of which is Exempt from Value Added Tax”.

*processing equipment, feed preparation equipment.*¹⁸

There is another important peculiarity concerning import of complexes and equipment: a modern complex is a large and bulky commodity and, often, it may be impossible to manufacture and supply all of its assembled components at the same time, in a single batch. In addition, an investor may find expedient, from merely technical considerations, to import the complex part by part, based on the sequence of building works. In other words, a complex often may be imported in several batches (shipment lots) rather than simultaneously, in a single batch. In this case, to avoid unnecessary waste of money and time, it is important to design customs and other formalities and procedures related to the import in such a way as to consider all of those circumstances, where appropriate.

Economic entities report that customs and other import formalities and procedures often do not take into consideration the aforementioned peculiarity of a complex/equipment import; the customs body requires that each batch be declared as a separate independent import, rather than a part of the complex. Nevertheless, if the importer wishes to declare it as a “complex”, then he/she should place the already arrived part (or parts) of the complex in the customs warehouse and await for the arrival of the next batch (or batches), until the complex is replenished. In that case, the importer incurs fines for the delay of the customs formality and additional costs for storage.

In this respect, it should be noted that after Armenia’s accession to membership in the EEU an important change occurred in the customs formality procedure, which may help to resolve some of the problems associated with the import of complexes/equipment. In particular, under the new procedures, economic entities can apply for preliminary classification of a complex, based on an application submitted in advance. According to Article 64 of the RA Law on Customs Regulation, “A product which has not been assembled or has been disassembled, including an incomplete or unaccomplished set, and is going to be imported or exported by separate shipment lots within a period of time exceeding the term defined by Article 170 of the Customs Code of the Customs Union, may be declared with one classification code, being stated according the Commodity Classification of Foreign Economic Activities, provided there is a customs body’s decision on classification of the product”. The EEU Customs Code (Article 170) defines a two- to four-month period for temporary storage of commodities.

Enforcement of this change can ease the import of complexes/equipment if economic entities are provided with an opportunity to transport the separate shipment lots to their premises (rather than incurring high costs for storage in the customs warehouse until the arrival of the next batch).

In order to enable economic entities to benefit from privileges or special procedures defined by the government, it is necessary to make necessary clarifications

¹⁸ The goods mentioned fall under the following tariff classification codes respectively (according to EEU nomenclature): 8434100000, 8434200000 and 8436100000.

and amendments in relevant regulations, and conduct awareness raising among the economic entities, for example, in relation to customs and tax procedures granting privileges, which are defined in article 170 of the Customs Code of the EEU, in RA Government decisions 1118-N, 1119-N and other resolutions such as the “RA Law on Approval of List of Goods Imported by Organizations and Private Entrepreneurs, Subject to a Zero Percent Rate of Customs Duties and Exempt from Excise Tax”).

It is also important to note that in the framework of Armenia’s accession to EEU membership, the customs duty rate on import of feed preparation equipment will be increased up to 5 percent (instead of the previously effective 0 percent).¹⁹ The import duty rate is zero on the import of milk collection and cooling centers, milk separators, milking equipment, milk processing machines.

Annex 1 provides additional details on the timeline of the customs duty (tariff) rates applied to goods imported into Armenia from other countries within the EEU.

2.7. MILK MARKET

Milk prices in Armenia are determined by market forces. They are not regulated by the state, and milk production is not subsidized.

In 2016, the annual average producer price for milk was dram 137 per liter of milk (Figure 5). One of the main concerns of milk producers is that the price of milk is too low to ensure a profitable milk production enterprise. Overall, producer prices for milk in Armenia are low compared to international milk prices; however, internationally, milk prices often are affected by state interventions in the market.

The milk market in Armenia is, first of all, characterized by the prevalence of fragmented smallholders. Milk is collected from a large number of milk collection centers located in various regions of Armenia. This creates additional logistical complexities, increases the transportation costs and, thus, the overall cost of milk production.

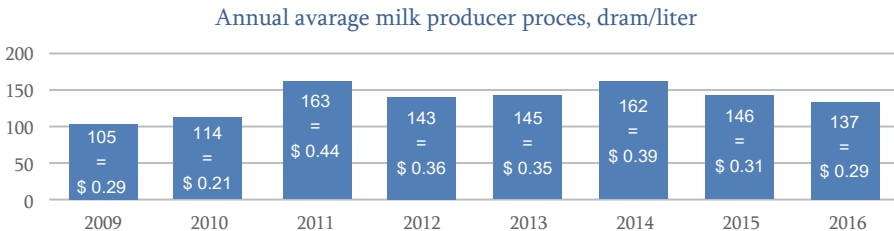


Figure 5. Source: RA NSS: “Prices and price indexes in Armenia”, “Food Security and Poverty”

19 Official website of the Eurasian Economic Commission: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.cct.eaeu.84.pdf> (last accessed on February 22, 2017).

The quality of milk and the milk price formation process in the market are also affected by additional factors. Small animal farmers have weak bargaining power in the market and are highly dependent on market prices dictated by medium and large processors. Moreover, milk producer-processor relationships are usually not contract-based, due to which farmers often face problems related to payment collection from processors. This latter issue is a very acute factor that negatively affects the functioning of the milk market today.

The state may ensure that effective and simplified mechanisms are in place for contract enforcement, as well as facilitate arbitration or dispute resolution. For example, there could be special dispute resolution procedures for agricultural contracts, for example, special mediation, as was created for the financial sector in Armenia.²⁰

Other government enabling activities to sustain contract farming may include (i) provision for training in technology and managerial skills at all levels -farmers, cooperatives, processors; (ii) provision of agricultural extension services and research works in relation to the main products contracted (for example, to ensure that farmers' produce complies with the quality and safety standards demanded by processors); and (iii) promotion of contract farming in various agribusiness forums.

The ineffective price formation process in the milk market leads to a distorted quality-price relationship. An effective quality-price relationship provides key signals to the participants in the market to improve their quality and productivity. Currently, milk is being priced based on the fat content, ignoring the protein content, bacteriological contamination, the presence of antibiotics, and other attributes, which significantly affect milk quality. In the technical regulation of milk and dairy products, the government established three classes of raw milk (High, First, and Second classes), based on the level of bacteriological contamination by microorganisms.²¹ However, these are not effectively applied in practice during price formation. As a result, dairy products are of low quality and are thus priced

20 There are other mechanisms applied internationally, e.g. the "... Government of Malawi established dispute resolution guidelines for agricultural contracts and offered the services of the Ministry of Labor to mediate. Likewise, in many large-scale, sugar-producing countries there are statutory bodies that act as arbitrators between sugar-cane growers and the sugar mills. In Canada, thousands of potato growers under contract with a single buyer negotiate prices and contract terms through the offices of the New Brunswick Potato Agency. It is compulsory that all potato farmers join the Agency", FAO, Contract Farming, Partnerships for Growth, 2001.

21 Government Decision No. 1925 of December 21, 2006. The classification was based on the level of presence of such microorganisms as MAFAM-mesophilic aerobic and facultative anaerobic microorganisms, intestinal infection bacteria, colonies making bacteria, salmonella, and somatic cells.

less reducing competitiveness of milk processors and their margins.²²

The seasonality of the milk supply combined with the lack of milk powder production capacities among milk producers affect the relationships between milk producers and processors. Milk powder production allows milk to be processed and stored during the high production season, to be used at other times of the year. This helps prevent a sharp decline in milk prices during the high season.

As a rule, farmers in Armenia do not have milk powder production and storage facilities, but at least six dairy factories do possess facilities for producing milk powder. According to the assessment of the Ministry of Agriculture, with effective utilization of current milk powder production capacities, Armenia could satisfy the local demand for milk powder. The annual production of milk powder during the milk production season (with uninterrupted milk supply) may reach 3,000 metric tons. However, at present, Armenian milk powder production is not competitive; it is more expensive compared to imported milk powder from Ukraine or other countries.

*It should be noted that an alternative to milk powder production could be the use of UHT (Ultra-High-Temperature) milk processing, which is widely used in many developed countries. For UHT technology, the raw milk should be of high quality. UHT technology involves treating milk at a very high temperature (over 135°C), which eliminates all bacteria (microorganisms). Thereafter, milk can be stored and used for a longer time.*²³

Milk producer prices, US\$/metric ton

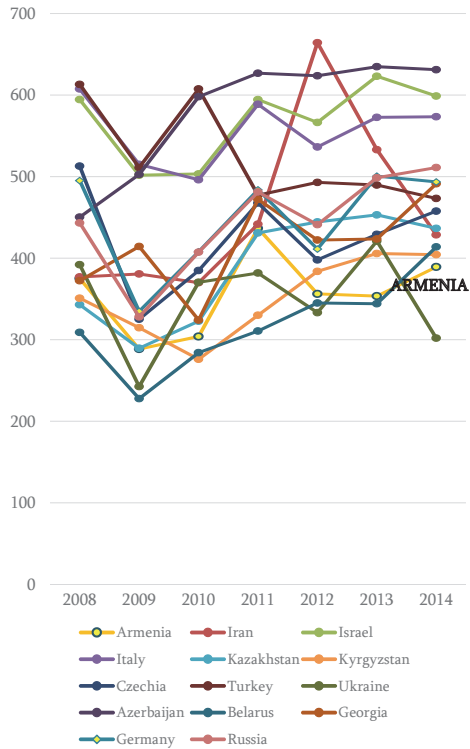


Figure 6. Source: FAO STAT, <http://www.fao.org/faostat/en/#compare>

22 There is an opinion that the use of milk powder strengthens the negotiating power of processors in the market over milk producers. For instance, during winter season the supply of milk declines, which, supposedly, should lead to increase of milk price. However, business entities report that milk processors often use a cheap input – milk powder, pressing down the price of domestic milk.

23 A number of large dairy producers in Armenia (e.g. Marianna company) already use UHT technology.

Table 4. Global milk prices, US\$/100 kg

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2006	23.9	24.0	23.9	23.3	23.0	22.8	22.9	23.1	23.2	24.0	25.9	29.1
2007	30.3	32.4	34.1	37.1	40.1	42.8	49.1	51.9	52.1	52.4	53.7	52.8
2008	50.2	47.9	46.9	45.0	45.3	45.6	45.3	42.0	36.8	32.9	28.0	24.4
2009	20.3	19.3	20.2	20.8	21.5	21.3	22.0	24.2	28.5	32.5	40.7	41.7
2010	37.8	36.1	36.2	39.8	41.3	39.5	37.6	37.2	38.9	39.8	40.1	40.7
2011	44.2	47.7	48.2	46.1	46.5	46.7	45.4	43.9	42.5	40.8	40.6	41.2
2012	41.6	40.9	39.5	37.0	35.2	34.3	33.9	35.2	38.0	39.3	39.5	39.9
2013	40.2	41.2	46.0	54.9	52.0	49.3	49.5	50.3	50.5	50.5	50.9	53.4
2014	54.4	56.0	54.7	49.5	46.8	44.6	43.8	39.2	35.9	34.8	33.3	33.0
2015	33.6	36.8	34.9	32.1	30.4	28.7	23.2	24.0	27.2	28.8	26.6	26.4
2016	25.4	24.1	22.4	22.2	22.1	24.2	25.1	28.7	33.3	34.1	34.8	35.8
2017	36.1	37.2	35.6	34.7								

Source: International Farm Comparison Network (IFCN) Data Table: World milk price in US\$/100 kg ECM (Energy Corrected Milk: 4% fat, 3.3% protein) <http://ifcndairy.org/about-ifcn-neu/ifcn-dairy-research-center-method/>; http://www.ifcndairy.org/en/output/prices/milk_indicator2013.php

To operate under the current market situation, smallholders, either directly or through individual intermediaries, try to apply the following strategies to survive in the market:

- ▲ Market milk directly to final consumers via direct sales in town/cities (door-to-door sales, or farmer markets)
- ▲ Process milk, make cheese (or yogurt or other dairy products) and market it at low prices via direct or indirect sales to small retail shops or public catering entities, or direct sales in town/cities (door-to-door sales, or open farmer markets). It should be noted that household-produced cheeses without a brand name are sold even in large supermarkets.
- ▲ Sell to other small household cheese producers, who process and market the cheese.
- ▲ The milk and cheese prepared and marketed in this way, as could be expected, is usually of low quality and cheaply priced. Business entities report that this phenomenon (of homemade cheese) has a number of negative effects in the market. In particular, it diminishes the motivation of milk producers to increase cows' productivity and improve the quality of milk. As a result, cheese producers also suffer, since they are left with no way of effectively linking milk quality and price.

To improve the effectiveness of market functioning, it is critical to ensure co-operation between smallholders. The activities geared toward promotion of the creation of milk collection centers and the establishment of milk producers' co-operatives played a very important positive role in the development of the sector. However, the current capacity of milk production and collection is still not sufficient to tackle the challenges in the milk (dairy) production sectors and promote exports.

2.8. KNOWLEDGE AND SKILLS

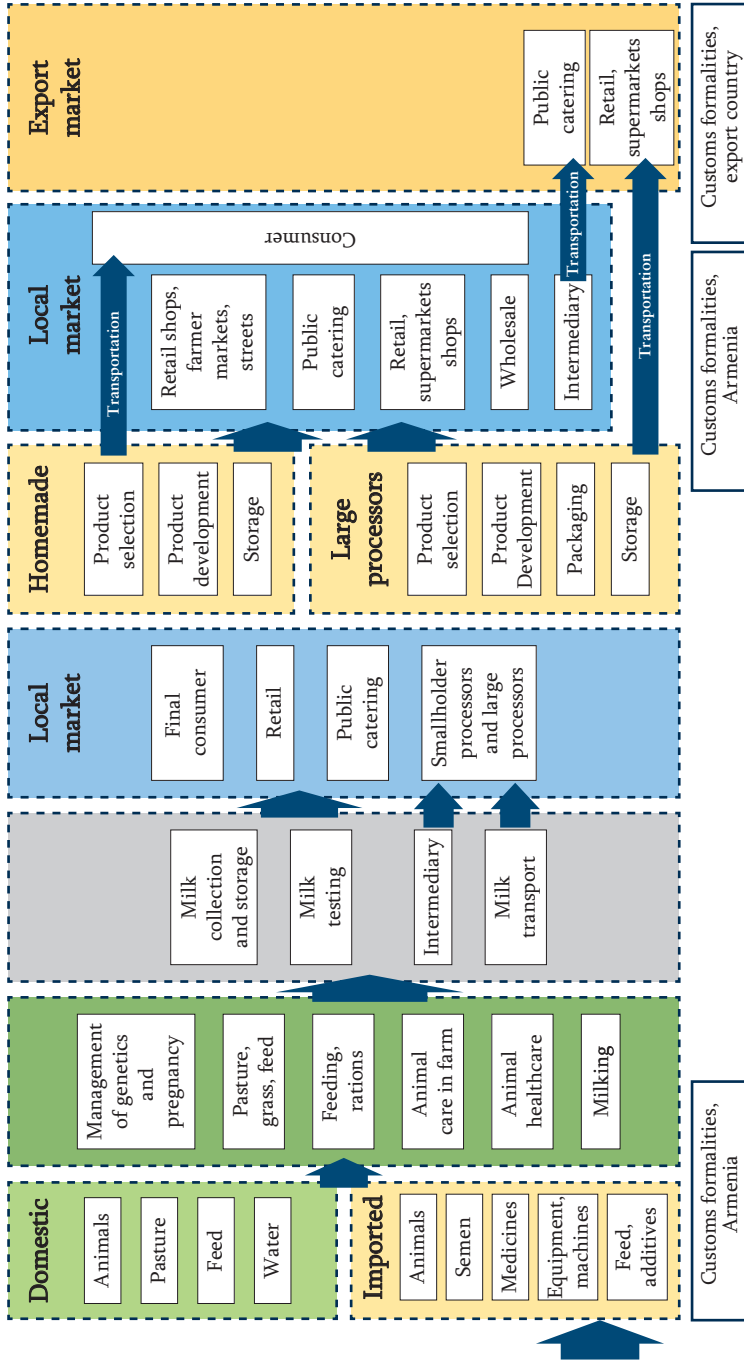
There is lack of knowledge and skills about advanced production technologies and practices across all stages of the milk and cheese production chain, which is a significant constraint for the development of the sector. This is related in particular to the lack of knowledge and skills in animal care and management, feeding, animal reproduction, farm management and milking practices, product quality, and safety management. This issue is present equally in all sizes of enterprises, but it is especially critical in *small and medium enterprises*.

To spur further development of the sector, it is necessary to enhance knowledge and skills regarding export markets and export opportunities among economic entities and organize distribution networks. At the same time, to ensure effective marketing by *small and medium entities*, it is necessary to enhance their knowledge and skills to enable joint marketing as well as effective organization of trade logistics.

2.9. ACCESS TO FINANCE

The introduction of advanced technology complexes and equipment and the expansion of production require significant financial investments. Meanwhile, such investments often require considerable long-term funding. It is difficult for businesses to access long-term loans in Armenia, which seriously hampers investment promotion. Other financing resources are not accessible, such as leasing, project financing, and credit lines, among others.

Figure 7. Cheese production and export supply chain



3. CHEESE PRODUCTION

3.1. TYPES OF CHEESES PRODUCED

Armenia produces and exports more than two dozen types of cheeses (cow, goat, and sheep cheeses, and very small amounts of buffalo cheese). Armenia has an abundance of highland alpine meadows, which creates favorable conditions for the production of high-quality cheeses. Some traditional cheeses such as Chanakh or Lori are produced across the whole country, while other types are produced only in specific regions. Production technology for some cheeses has remained unchanged for centuries (Table 5).

Table 5. Types of cheese produced in Armenia

Cow cheese	Goat cheese	Sheep cheese
Lori	Feta (“Dzor” brand name)	Pemaggio (Feta-like cheese)
Chanakh	Alpine Feta, in olive oil	
Chechil	Cheese Yeghegnadzor (in clay jars)	
Suluguni	Buried cheese (Yeghegnadzor brand name)	Blue cheese (Azat)
Gouda	Lactic cheese (Shevre brand name), with thin white mold	Soft blue cheese
Mozarella	Goat and cow cheese (Gladzor brand name)	
Cheddar	Tommy cheese (with white mold)	
Cheese Tomme - semi-hard, with alpine, from low-fat milk (with Vardenis brand name)		
Mascarpone		
Emmental		
Camembert		
Edam		
Moldy (blue) cheese		
Colby		
Ricotta		
Tashir		
Kate mold cheese (with blue-green mold)		



Figure 8. Cheese of Armenia (prepared by CARD)

3.2. CHEESE PRODUCERS

There are large companies, as well as medium and small family holdings, involved in cheese production in Armenia. According to RA NSS, there are 81 enterprises operating in the milk processing (dairy) sector, of which 50 enterprises are engaged in cheese production. Current production capacities allow processing of 490,000 metric tons of milk. The dairy industry employs around 1,900 staff involved in production.²⁴ These numbers do not include the large number of small homemade cheese producing holdings.

Due to the peculiarities of the Armenian environment, the average level of marketability of milk is 60 percent, that is, rural holdings (households) sell 60 percent of the milk they produce, while the remaining 40 percent of production is consumed or processed by holdings themselves.²⁵ In other words, at present, the milk processing capacity, excluding own processing by rural holdings, is 450,000 metric tons annually (including all dairy products), plus the capacity necessary for processing the imported milk powder or condensed milk.²⁶ In effect, the volumes of formal processing capacity and milk supply are almost equal, and the formal

24 Reference to the Ministry of Agriculture website (last accessed February 16, 2017).

25 RA NSS, “The realization (use) of agricultural production by agricultural households”, 2015 http://www.armstat.am/file/article/iracum_2015.pdf

26 In 2015, Armenia produced 728,600 metric tons of milk, and 60 percent of total production (437,200 metric tons) was consumed and processed in Armenia, excluding the consumption and processing by households (smallholdings).

and informal sectors of dairy producers, including cheese producers, compete for milk. In this case, further development of the cheese sector would require that milk and cheese (and other dairy product) production capacities develop or expand in parallel and in a synchronized manner.

The informal sector in the cheese production sector is substantial. According to the RA NSS, the total production of cheese in 2016 was 22,316 metric tons, of which around 16,000 metric tons, that is, 72 percent of total production, was produced by the informal sector in micro- or small holdings. Within the formal sector of cheese producers, which includes 50 business entities, the 10 largest producers represent the lion’s share—around 90 percent—of total formal production (see Figure 9).

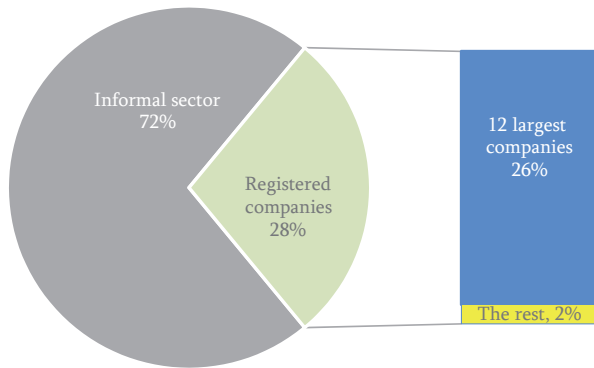


Figure 9. Structure of cheese production sector. Source: NSS Armenia

With time, some smallholders will be replaced with larger producers, but there are also development prospects for smallholders, who can capture certain segments of the market through cooperation (cooperatives, unions, etc.) and compete successfully with large producers. Similarly, small retailers can also compete with large supermarket chains through cooperation, as well as by specializing in serving selected segments of the market.

In this regard, it is important to enable businesses (via relevant training) to identify and capture appropriate market segments.

Discussions with businesses and observations during the study of the sector helped identify a set of characteristics to which the successful development of cheese producers could be attributed. Specifically, successful producers, as a rule, carry out careful and prudent planning of their production growth and development; do not seek or obtain loans without necessity and justification; are ready to learn advanced management technologies; and invest in technology, product development, and human capacity development. A number of failures noted in the sector were related to poor business and financial management, weak marketing and a lack of knowledgeable and skilled specialists.

3.3. TECHNOLOGY AND PRODUCTIVITY

In terms of product range, Armenia produces and exports traditional white, salty cheeses (Lori, Chanakh), as well as yellow firm and semi-firm cheeses (Gouda, Emmental, Cheddar), molded cheeses, and mozzarella, among others.

Technological equipment

The majority of large cheese producers have introduced modern, advanced production technologies and appropriate systems and equipment. Yet the majority of *small and medium producers* use low-grade technologies and equipment, thus, diminishing the productivity, quality, and international competitiveness of their cheese.

Quality and safety management

Armenian cheese producers, especially *small and medium enterprises*, yet do not widely use internationally accepted production and hygiene practices such as HACCP, GMP, EU requirements, and the standards of the Codex Alimentarius. *Large cheese producers* utilize much better conditions and sophisticated production systems; however, they also do not widely apply HACCP/GMP systems. The quality of cheeses produced in *small and medium enterprises* deteriorated due to the low level of sophistication of technologies implemented, the ineffective selection of cheese types for production, and insufficient investment and effort in product grading, classification, and packaging activities.

To increase product competitiveness and enter certain markets (in particular, the EU and EEU markets where strict food quality and safety standards apply, and food producers are required to apply HACCP),²⁷ there is a need to enhance productivity and to improve product safety and quality indicators. This can be achieved through:

- i. the introduction and application of HACCP, GMP, standards of Codex Alimentarius,²⁸ and other international standards, requirements and systems; and
- ii. enhancing human capacities necessary for the effective implementation of those relevant practices and standards.

Production cycle

As discussed above, Armenian cheese producers, both *small and medium as well as large producers*, face difficulties in ensuring uninterrupted, stable production throughout the year, due to the high seasonality of milk supply. Figure 4

27 “Comparative Analysis of Certain Requirements of Food Legislation in the European Union and the Customs Union of Russia, Belarus, and Kazakhstan.” IFC. 2015. World Bank Group, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/22385>

28 Official website of Codex Alimentarius: <http://www.fao.org/fao-who-codexalimentarius/standards/list-of-standards/en/>

depicts the seasonality of milk (and cheese) production in Armenia.

Other essential factors that affect the cycle of cheese production are related to types of cheeses in terms of the milk used, the renneting and fermentation processes, and time required for cheese maturation.

Cheese maturation time may range up to six months. For instance, maturation of Lori cheese requires two months, Dutch cheeses like Gouda and Cheddar – two and half month, and firm cheeses like Emmental cheese – six months.

In addition to classification based on the type of milk from which they are made (cow, sheep, goat milk), cheeses can be classified based on renneting/fermentation process (renneting and lactic acid fermentation). Cheeses with renneting represent the largest class of cheeses; they include firm, semi-firm, soft and salty cheeses.

The production process is affected also by the level of processing of milk used for production, i.e. if cheeses are from raw and pasteurized milk. Cheeses made from raw milk shall undergo maturation process for at least two months, before being offered for sale in the market. Non-mature cheeses should be consumed within few days, while mature cheeses can be kept for weeks.

3.4. ISSUES RELATED TO TAXATION

One of problems in the cheese production sector is related to the application of VAT. The production and sale of milk is exempted from VAT, as a primary agricultural product, while the production and sale of cheeses is not VAT exempted. As a result, since cheese producers are unable to deduct the VAT included in the milk that they purchase, they pay VAT on the whole value of the cheese. Businesses report that this issue is very acute in the cheese sector, because milk cost represents over 70 percent of the total cost of cheese.

3.5. CERTIFICATION OF CHEESE PRODUCTION

Business entities identified that the requirement to repeatedly undergo the conformity assessment (certification) procedures for every batch of cheese exported, including laboratory testing, is a timely and costly procedure that impedes export.

3.6. HUMAN RESOURCES

The shortage of qualified specialists is one of the serious problems hindering development of the milk and dairy production sector in Armenia. Professionals with relevant knowledge and skills are required for the proper establishment and efficient exploitation of dairy farms and processing capacities.

It is important that those specialists also possess skills in operating computer software and management systems so that they can work at high-tech facilities.

The Armenian National Agrarian University does provide programs and courses relevant to milk/dairy production; however, businesses think that the knowledge

and skills of the university alumni are far from satisfactory.

In parallel, there is a lack of knowledge and skills in general business management, including production planning, financial management, supply chain management, marketing, and so on. Often, problems related to a lack of/access to finance are due to weak knowledge and skills among businesses and mistakes in financial management.

3.7. CHEESE SECTOR ASSOCIATIONS/UNIONS

The unions/associations functioning in the cheese sector are the Union of Cheese Producers-LARI and the Union of Dairy Producers. These unions represent and protect the interests of dairy farmers and processors, coordinate collaboration between them, and provide services, such as the following:

- ▲ Acquisition and supply of production inputs and devices and equipment for members of unions;
- ▲ Practical advisory services and promotion of experience exchange (including trainings and seminars);
- ▲ Collaboration with public authorities, foreign and international structures, and addressing of problems/issues concerning the sector;
- ▲ Provision of assistance in issues related to milk and dairy product marketing and export; and
- ▲ Conduct of analyses, studies, and researches.

Lari Union has 70 to 80 members, and the Union of Dairy producers has 15 members (mainly large dairy producers).

Accelerated development of the cheese production has brought challenges with it: to face those challenges the sector associations require further strengthening of their capacities. With their current capacities, the associations will be unable to fulfill their responsibilities.

Another important form of cooperation in the animal husbandry and milk production sector is the operation of consumer cooperatives.

3.8. ACCESS TO FINANCE

A scarcity of accessible financial resources and the small assortment of financial instruments seriously limit cheese sector development. Economic entities, especially *small and medium enterprises*, face problems in terms of ensuring both working capital and investment funds.

Other financial resources, such as leasing, project financing, credit lines, and so forth, are also inaccessible.

4. POST-PRODUCTION PHASE

4.1. DOMESTIC MARKET

Until 2014, most of the cheese produced in Armenia was consumed domestically (Table 6). In 2014, annual domestic consumption of cheese in Armenia was roughly 18,650 metric tons, with production volume at 18,300 metric tons, export at 1,542 metric tons, and import at 1,188 metric tons. Average per capita cheese consumption per year in Armenia currently stands at 10 kilograms.

Table 6. Average per capita consumption of cheese in Armenia, kg²⁹

	2012	2013	2014	2015
Cheese consumption, per capita, kg	10.4	9.5	9.6	10.2

Small and medium producers as a rule market their produce via two channels of distribution—direct sales and sales through middlemen. One of the main peculiarities of milk and cheese markets in Armenia is the existence of the informal market of so-called homemade cheeses, which has a significant effect on the functioning of the market (Figure 10).

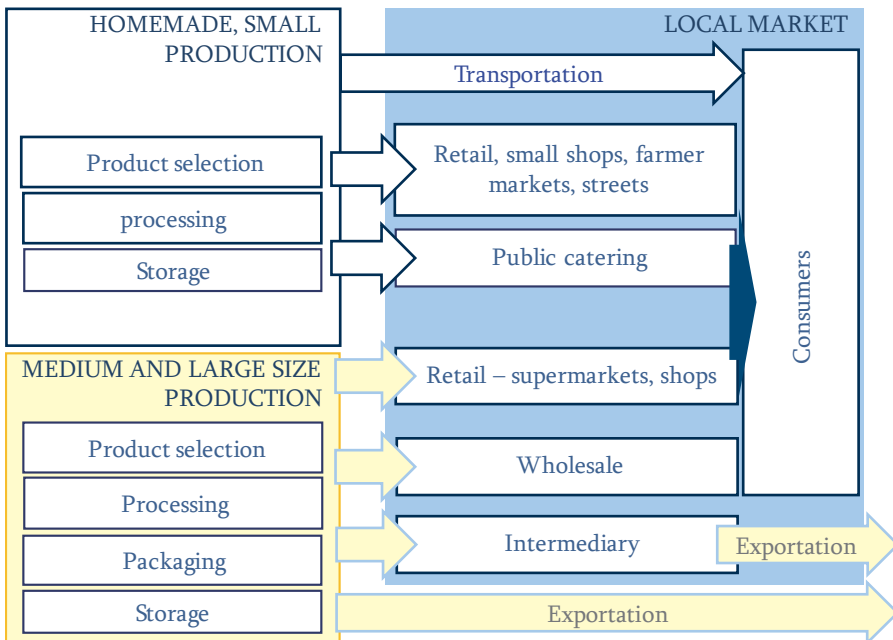


Figure 10. Cheese sale in the domestic market

29 RA NSS, Annual report on Consumer Price Indexes, January-December 2016 http://www.armstat.am/file/article/f_sec_4_2016_5.pdf

Relationships between milk suppliers and buyers in the homemade cheese market are informal in that they are not contract-based relationships. Businesses report that the production and marketing of homemade cheeses significantly distort the overall functioning of the cheese sector. There is no accurate data about the size of the informal cheese market. Based on estimates of entities involved in the cheese sector, informal dairy production may account for up to 25 percent of total milk supply, which can have a substantial effect on the operation of the dairy market. As noted earlier, 72 percent of total cheese production in Armenia was produced by the informal sector.

As a rule, homemade production is of low quality and commands a correspondingly low price in the market. The difference in price may be up to two times. Thus, in 2015 the price for one kilogram of cheese with high fat content was US\$3.30, while the price for low fat cheeses (skimmed milk cheeses) was US\$ 1.9 per kilogram (Figure 11). Informal producers have an advantage over formal producers, since the former, in effect, are not taxed. They also do not pay due attention to the quality and safety of milk as well as cheese (and other dairy products), which negatively affects the formation of an effective quality-price link in the market.

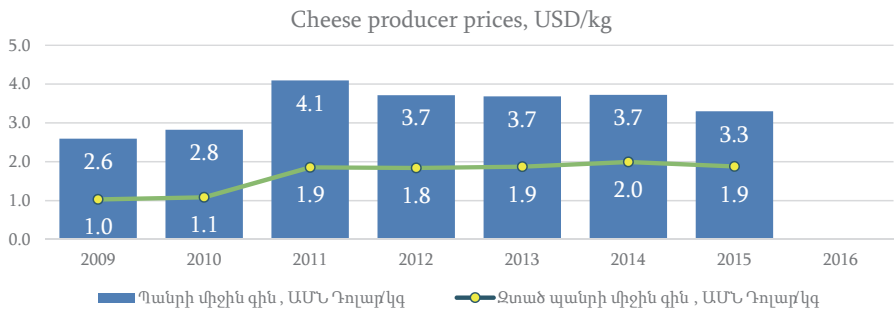


Figure 11. Prices and price indexes in Armenia. Source: RA NSS

From interviews with producers, it can be noted that milk producers tend, with time, to engage in cheese production. One of the main reasons for this tendency is the desire of milk producers to reduce the potential risks of non-payment by milk processors (buyers of milk) or other related problems.

To work with large processors, milk producers must ensure a regular supply of a large volume of milk. At the same time, the milk supplied to large processors must be of a stable quality, with standard characteristics, and must comply with food safety requirements.

Small and medium enterprises face a number of challenges while trying to comply with food safety requirements. In particular, smallholdings need to combine and properly grade their production in order to be able to ensure a stable supply of milk of sufficient quantity and with standard characteristics. The existing and

emerging milk collection centers and relevant farmer cooperatives play a key role in tackling this issue.

To increase the effectiveness of the functioning of the cheese market and promote good quality production, it is important to develop and apply proper standards for milk and cheeses and to establish and effectively enforce appropriate marketing, specifically product labelling requirements. It is necessary to ensure that the content of cheese and other dairy products is clearly and accurately presented to the consumer, and that a clear distinction is made between dairy products made from natural milk and those from milk powder and/or containing vegetable fats and oils.

4.2. EXPORT

The main export markets for Armenian cheese exporters are Russia and the United States.

Considering the limitation and saturation of the Armenian internal cheese market, at the present stage of development of the cheese sector, prior to expansion of cheese production, it is important to pay due attention to ensuring export markets, as well as to developing and producing product types that meet the existing demand of those markets.

Cheese export

Table 7 and Figure 12 illustrate the structure of the export of cheeses from Armenia in 2015:

Table 7. Armenia cheese export structure, metric tons

Tariff code	Cheese type	2014	2015
0406 90 990 9	White cheeses (from cow milk), salted	272.2	3854.5
0406907800	Gouda cheese	3.1	1595.9
0406902500	Tilzit cheese (semi-firm, light yellow)	0.0	717.0
0406902300	Edam cheese	0.0	563.4
0406902100	Cheddar cheese	0.0	341.0
0406900100	Other, for production of melted cheese	826.1	338.4
0406 40 900 0	Blue cheese (with mold), other	0.0	343.5
0406 20 900 0	Other, grinded of powder cheeses	109.7	204.3
0406 10 800 0	Curd, other	178.0	193.5
0406 10 800 0	Curd, other	0.0	102.7
	TOTAL	1542.4	9104.5

Source: RA NSS, <http://www.armstat.am/file/article/f. t-2015-10-nish-1.pdf>

In 2015, 42 percent of the export was white, salty cow cheeses, while 17.5 percent of export, Gouda cheese. There was a sharp increase in the export of both traditional white cheeses (Lori, Chanakh) and yellow, semi-hard cheeses (Gouda, Cheddar, Edam, Tiltzit).

It should be noted that the sharp increase in cheese exports was not accompanied by such an increase in milk or cheese production. It was also not accompanied by a reduction in the domestic consumption of cheese: in 2015, the consumption of cheese in fact increased to 10.2 kilograms per capita per year, compared to 9.6 kilograms per capita per year in 2014.³⁰ Whatsoever, it is apparent that there is significant, underutilized scope for export expansion.³¹

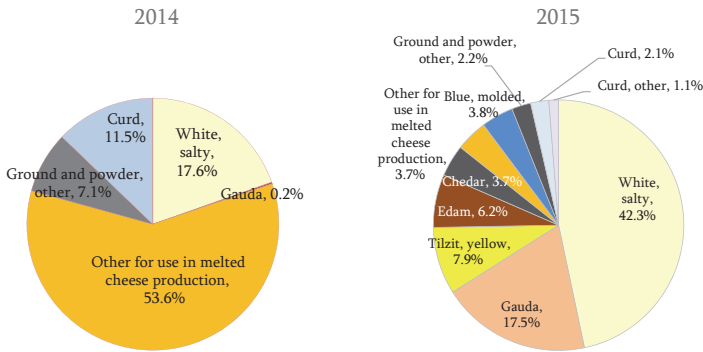


Figure 12. Cheese export structure. Source: RA NSS.

Export of animals

The market for live animals in Armenia is open and competitive. However, stakeholders report that the direct involvement of the government in the importation and allocation of breeding animals negatively affects competition in the live animal market.

There is export of live animals from Armenia to Georgia, but in small quantities. According to businesses, there is a demand for animals with high-quality genetics in Georgia, but the export of animals is hindered by administrative barriers.

Export markets

Russia and the United States are the main export markets for Armenian cheese exporters. There are large Armenian diaspora communities in the two countries. In addition, Armenian cheese is a familiar product for consumers in the Russian market. In the U.S. market, the main consumer for Armenian cheeses, especially white, salted cheeses (Lori, Chanakh) are diaspora Armenians living in the U.S.

30 “Food Security and Poverty, 2016”, RA NSS; http://www.armstat.am/file/article/sec_3_2016_5.pdf (last accessed February 8, 2017).

31 The increase in the export volume may be conditioned by other factors such as import into and re-export from Armenia of cheeses originated in other countries.

Export expansion opportunity

Exporters may benefit from the advantages of EEU membership. The demand for agricultural products, particularly, for Armenian products, is gradually increasing in the Russian market; this opens up export opportunities for Armenian business entities, *including small and medium businesses*. In terms of market size, the Russian market, in essence, provides an unlimited expansion opportunity for Armenian producers and exporters, although Russian domestic cheese producers themselves are strong competitors in the market.

However, focusing only on a single large market like the Russian market is risky, as demonstrated by developments in the Russian market and economy in recent years. It is important to take into account that competition in the Russian market drastically intensified, despite international economic sanctions against Russia.

With the lifting of economic sanctions against Iran last year, the role of Iran in the Russian cheese market may increase, despite the fact that in 2015, there was no import of cheese to Russia from Iran.³² Turkey may also become a significant player in the Russian market, after the elimination of import limitations in relation to Turkish products by Russia.

Traditionally, producers from Ukraine and Belarus have played a major role in the Russian cheese (and other dairy) market as their products have a reputation for being of good quality. During recent years, due to political tensions, the presence of and competition from Ukrainian producers in the Russian market diminished (Table 8). After losing their traditional market in Russia, Ukrainian producers started to export their dairy products (including milk powder) to other markets at low prices. The import of cheap milk powder from Ukraine has had negative effects on milk prices as well as on milk powder production in Armenia.

Table 8. Cheese imports to Russia, metric tons

	2010	2012	2015
TOTAL	293,650	399,230	200,595
Belarus	-	79,305	161,448
Ukraine	66,011	56,174	2,766
Armenia	386	868	9,000
Kazakhstan	-	398	1,314
Germany	83,012	72,916	38
Netherlands	24,648	35,973	20
Poland	14,118	21,897	56
France	7,098	8,756	1,088
Turkey	-	-	287
Iran			

Source: UNCOMTRADE data, <https://comtrade.un.org/data/>

32 UNCOMTRADE database, <https://comtrade.un.org/data/>

As indicated in table 8, in a short period after the application of economic sanctions by the EU against Russia, and the prohibitions applied by Russia against imports of agricultural products from the EU, exports of cheese from Belarus to Russia increased sharply. This may be a result of importation and re-exportation of EU cheeses through Belarus to Russia, bearing in mind the trade regime between Belarus and Russia, which are both members of the EEU.

It is important to note that Armenian producers are competitive in the Russian market in terms of price, despite the high transportation costs. Price competitiveness can be noted by comparing the information in Figures 5 and 11 and Tables 9 and 10. In 2015, the average producer price for milk in Armenia was US\$0.31/kg, that is, around two times cheaper than the average price of Russian producers. In 2015, the average producer price of rennet cheeses in Armenia was US\$3.3/kg, which was considerably lower than the average price in Russia—US\$4.4/kg. It should be noted also that the average consumer price for rennet cheese in Russia was US\$6.6/kg, which can ensure profitability for Armenian exporters.

Table 9. Cheese consumer prices in Russia, US\$/kg

	2012	2013	2014	2015
Rennet cheeses, hard and soft	8.41	9.86	9.69	6.58
Melted cheeses	5.63	6.05	5.91	4.38
National cheeses and Bryndza	8.10	8.63	8.16	6.08

Source: Federal State Statistics Service of Russia: “Prices in Russia”: http://www.gks.ru/bgd/regl/b16_17/Main.htm; http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138717314156

Table 10. Milk and cheese producer prices in Russia, US\$/kg

	2012	2013	2014	2015
Raw Milk (farmer price)	0.42	0.48	0.49	0.32
Hard cheeses	5.93	7.35	7.30	4.50
Melted cheese	2.39	2.86	2.96	2.22

Source: Federal State Statistics Service of Russia: “Prices in Russia”: http://www.gks.ru/bgd/regl/b16_17/Main.htm; http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138717314156

In terms of the cost efficiency of cheese production, Armenian cheese producers seem to have a cost advantage over Russian (Belarus, Ukrainian) cheese producers. The estimated cost of producing one kilogram of rennet cheese in Armenia is around US\$3.1 compared to US\$3.94 in Russia. For better comparison, when the transportation cost per kilogram of cheese from Armenia to Russia (Moscow) is added, about US\$0.14, the total cost is, US\$3.1+US\$0.14 = US\$3.24 per kilogram of cheese.

The cost advantage is due mostly to lower production and commercial or marketing costs for Armenian companies. In this context, it is critical to note that these costs may increase when, for the purposes of increasing the competitiveness and expansion of the cheese sector, investments are made to enhance production technologies, food safety systems, product development, and marketing activities.

Table 11. Rennet cheese production cost comparison, Armenia and Russia, 2015

	ARMENIA ³³		RUSSIA ³⁴	
	US\$	%	US\$	%
	Raw materials, of which:			
Milk	2.49	0.82	2.74	0.70
Other inputs	0.06	0.02	0.25	0.06
	Production & commercial costs			
Salaries	0.17	0.06	0.17	0.04
Utility costs	0.02	0.01	0.12	0.03
Other (incl. quality control, marketing)	0.21	0.07	0.46	0.12
	Packaging and storage			
Packaging	0.09	0.03	0.12	0.03
Storage	0.00	0.00	0.07	0.02
TOTAL costs	3.05	1.00	3.94	1.00

To maintain and expand their market share in Russia and other export markets, Armenian enterprises should give due consideration to enhancing the competitiveness of their production, not only in terms of cost efficiency, but also in terms of increasing product variety and quality. It is important to note that with the depreciation of the national currency of Russia, the financial risks faced by Armenian exporters would grow, and hence weaken their competitive position.

In parallel, in the medium to long term, it is necessary to invest adequate effort in identifying and entering foreign markets other than the Russian market. Particularly, in the U.S. market, the Armenian diaspora could be targeted for entry and then expansion into other diverse segments. Middle Eastern countries can also be viewed as interesting potential markets given that a halal certification center was recently established in Armenia.

33 Calculations are made based on information provided by businesses. Figures may differ among different business entities, and may change with time.

34 Federal State Statistics Service of Russia: “Prices in Russia”: http://www.gks.ru/bgd/regl/b16_17/Main.htm; http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1138717314156

To fully benefit from export opportunities, *small and medium* entities need to join their capacities. To achieve this target, they need to ensure the following:

- ▲ Selection of marketable and transportable cheese types (for instance, consumers in the Russian market prefer the so-called “European cheeses”), as well as production of such cheeses by all involved producers;
- ▲ Regular supply of sufficient volume;
- ▲ Compliance with food safety requirements;
- ▲ Stable, standard appearance and quality of products, through classification and sorting of products by types, sizes; and
- ▲ Standard packaging.

Product quality, sorting and packaging

Relatively large enterprises, which deal with larger buyers, apply advanced technologies for product sorting and packaging. However, improved product sorting technologies that ensure stable quality and appearance, packaging, and marketing are not yet widespread among *small and medium enterprises*.

The practice of banding together in order to market the production jointly has not yet been adopted among *small and medium* businesses in Armenia. Agricultural producers’ unions and cooperatives may play an important role in that process.

To unite the capacities of *small and medium producers*, it is also very important to ensure the availability of cold storage facilities, where producers can collect, sort, and package their products. With regard to export promotion, defining and enforcement of internationally compatible standards and technical requirements among producers should be highly prioritized.

Export permissions and procedures

For each batch of cheese being exported, exporters must obtain a veterinary certificate, issued by the RA State Service for Food Safety.

Business entities identified that the requirement to repeatedly undergo the conformity assessment (certification) procedures for every batch of cheese export, including laboratory testing, is a timely and costly procedure that impedes export.

Transportation routes and means

Most of the cheese exports are transported by road (usually in refrigerated trucks). Export by trucks extends along a transit road through Georgia, entering Russia at the Lars border crossing point. The average cost of transporting by a 20-ton truck is US\$2,500 to US\$3000, plus US\$200 of unofficial payments.

Economic entities cite a shortage of trucks in the summer season, when open field crops are harvested, and export volumes grow. In that case, Armenian exporters use the services of ground cargo carriers from other countries, in particular, Russia or Georgia.

Shipment by ferry through Georgian seaports is not yet widespread for export of cheese; however, it could become an important route in the future.

Knowledge and skills

For further development of the sector, there is a need to enhance capacities and knowledge of external markets and export opportunities, as well as techniques for the development of distribution channels.

4.3. EXPORT FINANCING AND INSURANCE

Export insurance can be obtained in the market; however, business entities face difficulties receiving compensation for cargo loss or damage. It is difficult, and often impossible, to receive compensation from insurance companies.

5. SUPPORTING INSTITUTIONS AND INFRASTRUCTURE

5.1. STORAGE FACILITIES

To promote the development of the cheese sector, Armenia will need to promote the establishment of *dairy hubs*, which shall operate on a notably larger scale (in terms of their capacity) than the milk collection centers utilized at present. The development of such infrastructures will require effective cooperation between milk producers and cheese producers. At the same time, it will be important to ensure public-private partnership (through the implementation of joint projects).

The future development of the cheese sector will require cold storage facilities for collection, handling, and storing of products, which in turn will require (a) attraction of investment funds, and (b) training and development of specialists. It is important to note that the establishment of small and medium-scale collection and sorting enterprises will contribute to cooperation between economic entities (in the form of cooperatives or associations), aimed at ensuring that the standard, high-quality, and safe production requirements dictated by the market, especially export markets, are met.

5.2. INFRASTRUCTURE

Business entities report that one of the factors impeding investment in the cheese sector is the administrative barriers related to establishing the necessary infrastructures. This is related, particularly to the complex, lengthy, and costly administrative procedures that businesses face when trying to setting up electricity, water and gas supply lines for cheese production facilities. This issue is especially acute in the cheese sector, because for *small and medium cheese producers* it is important to locate their production facilities close to milk collection centers, and the latter are often in territories not equipped with electricity and gas supply lines.

5.3. EXTENSION AND ADVISORY SERVICES

To enhance human capacity, it is critical to increase the involvement of the state and the effectiveness of its involvement in advisory and extension services. At present, budgetary allocation for state extension services is too limited to ensure any tangible result (dram 397.2 million, or US\$831,000, in 2016).

Research and development (R&D) as well as extension services are weak and unable to meet the needs of the agricultural sector. Universities, as well as the private businesses entities, do not have the capacities to carry out effective R&D activities, and government and private sector spending on research R&D is low. Extension services are carried out mainly through Marz Agricultural Support Centers (MASCs) in each marz, which lack the resources and the capacity to effectively fulfill their mission. In 2017, with the aim of enhancing the effectiveness of MASCs, the Government made a decision to modify the structural as well as

operational and functional settings of MASCs, in that MASCs will become part of the newly established Agriculture Development Foundation. Operational and functional modifications are still under way.

5.4. FINANCING AND FINANCIAL INSTITUTIONS

In general, the shortage of and the difficulty accessing long-term and affordable financing resources restricts the growth and development of businesses. Interviews with businesses show that the application of sophisticated export and investment finance instruments (such as working capital financing, funding of projects, trade finance instruments, and expedients like credit lines, insurance, effective monitoring, and so forth) needs to expand further if it is to really fuel production and export development, while integrating environment-friendly technologies and advanced food safety systems.

6. GOVERNMENT POLICIES AND PROGRAMS

Within the framework of Agriculture Development Strategy (ADS) 2000-2020, the Government of Armenia, in cooperation with international donor organizations, has implemented a number of projects to achieve the following:

- ▲ Increase local breeds' productivity by importing animals with high-quality genetic potential and cross-breeding them with local breeds,
- ▲ Establish a farm and livestock registration system in the country,
- ▲ Improve pasture management,
- ▲ Improve infrastructure, such as small-scale slaughter houses.

Within the framework of the 2007-2015 program on the Development of Cattle Breeding,³⁵ since 2007, the government has imported high-quality pure breed cows to improve the domestic genetic resource and increase milk productivity. So far, the government has imported over 2,800 head of high-quality breeds and distributed them to 60 entities engaged in livestock breeding under flexible payment terms.³⁶

A number of other projects have been implemented geared toward development of the animal husbandry sector and milk production in cooperation with international financial institutions and donor organizations, including the following:

- ▲ World Bank Group: Community Agricultural Resource Management and Competitiveness Project (CARMAC): 2011-2016.
- ▲ Swiss Agency for Development and Cooperation (SDC): Livestock Development in the South of Armenia: 2014-2020. Project budget: SwF 10 million.
- ▲ Swiss Agency for Development and Cooperation (SDC): Making markets work for Armenian livestock farmers: 2011-2015. Project budget: SwF 5.4 million.
- ▲ Armenian Development Agency (ADA): Animal Health Management in Armenia and Georgia: 2015-2018. Project budget: €1 million.

Many donor organizations have been involved in the promotion of milk collection centers throughout many regions of Armenia. These include, USAID, SDA, Heifer International, UNDP, Save the Children, COAF, and World Vision, among others. The number of milk collection centers and milk farm cooperatives benefiting from these centers increased significantly and contributed to the improvement of the quality of milk collected and an increase in the price of milk.

Since the early 2000s, the Center for Agribusiness and Rural Development (CARD) in cooperation with the Government of Armenia, donor organizations, and the World Bank, has initiated and implemented a range of projects geared toward supporting milk farms via establishing milk collection centers; improving

35 RA Government Decision No. 336-A of March 22, 2007.

36 Farmers can make payments over four years: 10 percent off in the first year, 20 percent in the second, 30 percent in the third year, and the last 40 percent in the fourth year.

artificial insemination (AI) to ensure better genetic resources; and providing assistance with animal health care and farm management to farmers across regions of Armenia. To improve animal health, artificial insemination, and other agricultural services, CARD has established a network of farm and veterinary service centers (FVSCs) in regions of Armenia. These are commercially viable entities, which provide services and technical assistance to farmers and supply semen, medicines, tools, and other equipment used for animal husbandry and milk production. So far, 13 FVSCs have been established and are effectively operating in regions of Armenia, and nine more are planned by 2017, for a total of 22 FSCs in Armenia.

These projects and activities contributed significantly to development of the animal husbandry and dairy sectors. In particular, as indicated in the Box 2, within the framework of CARMAC project, the following were achieved:

- ▲ About 176,000 hectares of previously unused or underused pastures have been equipped with watering points, which reduced pressures from animal grazing on more degraded pastures elsewhere.
- ▲ Cattle milk productivity increased by about 137 percent (in communities under the project).
- ▲ Cattle weight gains increased by about 127 percent.
- ▲ Pasture use fees collected by communities increased by about 200 percent.
- ▲ The value of livestock product sales increased by 268 percent.

At the same time, to promote investment, the government has defined special procedures to provide customs duty and tax privileges (particularly, VAT), for instance, relief from customs duty payment and postponement of VAT payment—under RA Government Decision Nos. 1118-N and 1119-N.³⁷ In order to enable economic entities to benefit effectively from the opportunities provided by these decisions, there is a need to raise awareness among businesses.

For further development of the sector, the government must make it a priority to take targeted measures in order to promote investment. Such measures may include the design and encouragement of special loan and grant terms (i) to encourage investment in the introduction of highly productive, energy-saving, and

37 RA Government Decision No. 1118-N of September 17, 2015 “On Approving necessary conditions for enforcement of the relief from import duty on technological equipment, components and accessories thereof, raw material and substances imported within the frameworks of the investment program in priority sectors, and recognizing an authorized body.”

RA Government Decision No. 1119-N of August 4, 2011, “On approving the procedures of electing organizations and private entrepreneurs for the extension of periods of “Temporary exportation” applied to goods exported under the customs arrangement of “Temporary exportation” and deadline delays, and electing organizations and private entrepreneurs for the payment delay of value added tax amount calculated by customs bodies in case of importation of goods, on amending the Government Decision No. 1934-N of November 9, 2005, and on revocation of RA Government Decision No. 600-N of April 30, 2009.”

environmentally friendly technologies to enhance production capacities; and (ii) to encourage investment in market infrastructures (milk collection centers and dairy hubs, cheese storage facilities) and utility and transport infrastructure (gas, electricity lines, roads) for cheese production entities.

Under the RA Government Protocol Decision No. 49 of December 15, 2011³⁸ dairy production is included in the list of priority sectors for export promotion. However, there has been no strategy or action program prepared for development of the sector.

38 RA Government Protocol Decision No. 49 of December 15, 2011, “On Approving the Export Driven Industrial Strategy of Armenia”.

ANNEX 1. ARMENIA-EEU RELATED INFORMATION

Schedule of customs duty rates (import tariffs) applied to goods imported into Armenia from EEU countries³⁹

Commodity	Classification Code, EEU	Before EEU 2014	2015	2016	2017	2018	2019	2020	2021	2022	EEU
Pure-Bred Breeding Bovine Animals	0102 21	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0% ⁴⁰
Heifers	0102 21 10 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0%
Cows	0102 21 30 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0%
Other	0102 21 90 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0%
Other bovine animals	0102 29	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5% ⁴¹
	0102 29 05 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 10 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 21 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 29 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 41 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 49 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 51 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 59 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 61 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 69 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 91 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
	0102 29 99 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
Buffalos											
Pure-bred breeding buffalos	0102 31 00 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0%

39 The Treaty on the Accession of the Republic of Armenia to the Treaty on the Eurasian Economic Union, May 29, 2014; Official Website of EEU: <http://www.eurasiancommission.org/ru/Lists/EECDocs/635486381049072687.pdf>. last visited January 20, 2017;

40 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.01.pdf> , last visited February 22, 2017.

41 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.01.pdf>, last visited February 22, 2017.

Commodity	Classification Code, EEU	Before EEU 2014	2015	2016	2017	2018	2019	2020	2021	2022	EEU
Other domestic	0102 39 10 00	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
Other	0102 39 90 00	5%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5%
Seeds	1209	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5% ⁴²
Animal Feeds	2309	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5% ⁴³
Fertilizers, of which	31	0%	0%	0%	0%	2%	4%	EEU	EEU	EEU	6.5% ⁴⁴
	3102 109000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3102 50	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3102 600000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3102 800000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3102 900000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3104 201000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3104 900001	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0%
	3104 900009	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3105 901000	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3105 909100	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
	3105 909900	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	6.5%
Insecticides and similar chemicals, of which	3808	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	3% or 5% ⁴⁵
Insecticides, other	3808 91900 0	0%	0%	0%	0%	0%	2%	EEU	EEU	EEU	5%

42 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ett12%2001.09.2014.pdf>, last visited February 22, 2017.

43 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ett12%2001.09.2014.pdf>, last visited February 22, 2017. Under this heading there is an exception for products under the sub-heading 230990 (other feeds), on which the EEU import customs duty rate (5%) will be applied from 2020.

44 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ett31%2001.09.2015.pdf>, last visited February 22, 2017.

45 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ett38%2001.09.2015.pdf>, last visited February 22, 2017.

Commodity	Classification Code, EEU	Before EEU 2014	2015	2016	2017	2018	2019	2020	2021	2022	EEU
Fungicides, with copper	3808 92100 0	0%	0%	0%	0%	0%	2%	EEU	EEU	EEU	3%
Fungicides, other	3808 92900 0	0%	0%	0%	0%	0%	2%	EEU	EEU	EEU	5%
Plant growth regulators	3808 93900 0	0%	0%	0%	0%	0%	2%	EEU	EEU	EEU	5%
Disinfectants, other	3808 94900 0	0%	0%	0%	0%	0%	2%	EEU	EEU	EEU	5%
Milk collection and cooling tanks	8419	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0% ⁴⁶
Milk separators	8421 11 000 0	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0% ⁴⁷
Milking equipment	8434 10 000 0	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0% ⁴⁸
Milk Processing equipment	8434 20 000 0	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	0% ⁴⁹
Feed production equipment	8436 10 000 0	0%	EEU	EEU	EEU	EEU	EEU	EEU	EEU	EEU	5% ⁵⁰

46 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.84.pdf>, last visited February 22, 2017.

47 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.84.pdf>, last visited February 22, 2017.

48 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.84.pdf>, last visited February 22, 2017.

49 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.84.pdf>, last visited February 22, 2017.

50 Official website of the Eurasian Economic Union: <http://www.eurasiancommission.org/ru/act/trade/catr/ett/Documents/ru.ctc.eaeu.84.pdf>, last visited February 22, 2017.

ANNEX 2. FOREIGN TRADE IN AGRICULTURAL PROD

Export of agricultural products from Armenia (SITC Rev4 classification), including processed products, US\$, thousands UCTS

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
TOTAL, including non-agricultural products	973900	985100	1115200	1057200	710200	1041100	1334300	1380200	1478700	1519300
Agricultural exports, as percent of TOTAL	12%	12%	15%	19%	18%	15%	17%	23%	26%	27%
Animals	39	362	680	1062	4323	922	494	4601	4951	3300
Meat and meat products	978	2146	3136	2019	1202	1101	1196	2882	2760	4659
Milk and eggs	4135	2609	1930	2654	1864	2286	2463	3249	7585	9081
Fish and crustaceans	3170	4646	4679	5359	3545	8007	16140	22546	33707	31389
Cereals and cereal products	145	180	400	489	395	358	478	992	1331	1936
Fruits and vegetables	8042	12742	12036	14976	15518	17500	28307	42422	52691	45398
Sugar and confectionary	89	63	36	69	123	1644	3026	879	1291	1084
Coffee, tea, cocoa	7794	10072	14941	15850	10305	6866	6744	7432	6759	7412
Feeds	36	20	34	453	89	72	109	38	52	48
Other food products	187	368	848	360	495	522	893	1371	1272	1618
Beverages	84274	79009	126110	145004	79933	108711	146703	184955	207563	187884
Tobacco and tobacco products	3460	3428	4181	7777	8581	8307	16320	41861	69084	115900

Source: RA NSS, Annual reports on foreign trade based on two-digit goods classification.

ANNEX 3. REFERENCE SOURCES AND LITERATURE

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