Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 19, Issue 2, 2019
PRINT ISSN 2284-7995, E-ISSN 2285-3952

EVOLUTION OF THE DAIRY SECTOR OF THE REPUBLIC OF MOLDOVA: LATEST TRENDS AND DEVELOPMENTS

Anatolie IGNAT, Eugenia LUCASENCO

The National Institute for Economic Research, 45 Ion Creanga str., Chisinau, Republic of Moldova, Emails: anatolie.ignat@gmail.com, eugenia_lucasenco@yahoo.com

Corresponding author: anatolie.ignat@gmail.com

Abstract

The paper aims to analyze the evolution of the dairy sector of the Republic of Moldova, by presenting the latest trends in the sector and a wide analysis of the sector since 1990. Research has been carried out based on statistical data provided by the National Bureau of Statistics of the Republic of Moldova and data accessed from UN Comtrade database. The main analyzed indicators refer to number of dairy cows, milk production, imports and exports of dairy products. Therefore, the number of milking cows has diminished by about 3.6 times between 1990 and 2017, milk production declined by 3.4 times from 1,503 to 443 thousand tons in the same period, while the productivity, after a period of decline in 1990-1995, has stabilized between 1996 and 2004 and has started to rise since 2005. At the same time, the balance of foreign trade in dairy products is deeply negative for all categories of dairy products. Conclusions of the paper present a difficult situation in the dairy sector, with potential prospects of recovery as a result of paying a special attention to this sector by the governmental institutions.

Key words**:** *milk production, import, export, Republic of Moldova, dairy sector*

INTRODUCTION

The social and economic importance of the dairy sector is primarily due to the fact that it represents a source of high biological value food products, thus producing the most significant part of the milk production and about 10% of the volume of meat from the Republic of Moldova.
Cattle are also an efficient mean of transforming different crop resources and residues of the food industry into products with a superior biological value. At the same time, milk sales are an important source of income for many families in rural areas.

MATERIALS AND METHODS

For a better analysis of the evolution of the dairy sector of the Republic of Moldova, the following indicators have been used: number of cattle heads, number of cattle by categories of household, number of milking cows, milk production and consumption. The analyzed period covers the years 1990 – 2017. The data was provided by the National Bureau of Statistics of the Republic of Moldova, Ministry of Agriculture, Regional Development and Environment and UN Comtrade database.
Previous research concerning the dairy sector of the Republic of Moldova have been carried out by Stratan [9], Ignat [2], [3], Prohnitchi [8], Fedorciucova [1] and others.

RESULTS AND DISCUSSIONS

Cattle breeding in the Republic of Moldova had the highest degree of development during the period 1989-1990. During these years, the cattle herd reached the level of 1,112 thousand heads, including 402 thousand heads of cows. Therefore, in order to make a comparison with the above-mentioned period, in 2017 the total number of cattle was 164 thousand heads, of which 112 thousand cows [6]. Thus, only in the last ten years the cattle population has decreased by about 33 percent, including the cows for milk by about 43 percent (Figure 1).
Compared to the 90s, the way milk production is organized has also experienced fundamental changes. Thus, in 1990 about 1,150 dairy farms operated in Moldovan SSR and the largest part of the milking cows was grown at these farms [6].

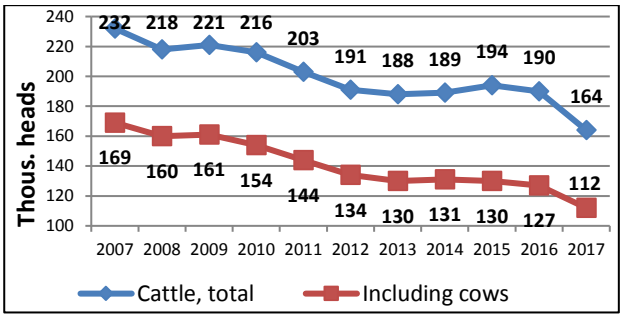

Fig. 1. Number of cattle, 2007-2017, thousands of heads
Source: elaborated by authors based on NBS data [6]

On 01.01.2018, according to MARDE data 120 commercial dairy farms were operating, with a total number of 10,168 milking cows, which represented only slightly more than 9% of the total number of milking cows [4]. Another 91% of the dairy cows were kept in households by individual animal keepers with an average of 1-2 cows.

The main breeds of bovine animals raised in the Republic of Moldova are those for milk and milk and meat such as Moldovan black spotted, Holshtein and Simmental.

At the same time, some positive trends are observed in the dynamics of the development of cattle farms. Thus, starting with 2014, despite the decrease in the total number of cattle, including cows, the number of animals in agricultural enterprises increased from 12.3 thousand in 2014 to 19.1 thousand in 2018 [5] or by about 55 percent (see Figure 2).

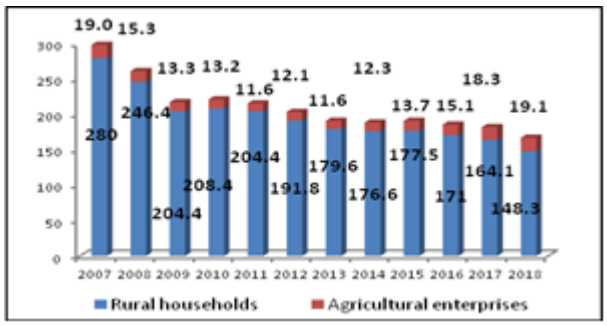

Fig. 2. Dynamics of cattle by household category, 2007-2018, thousand heads
Source: elaborated by authors based on NBS data [6]

Dynamics of milking cows herd follows broadly the same trends. Thus, the herd of milking cows kept in the agricultural enterprises after a short phase of growth in the years 2013-2016 has entered in a reduction phase since 2017, so that in 2018 the number of milking cows in these enterprises reached 5.4 thousands (Figure 3).

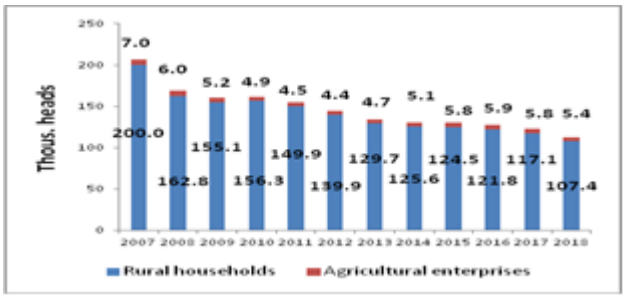

Fig. 3. Number of milking cows by types of households, 2007-2018, thousands of heads
Source: elaborated by authors based on NBS data [6]

The total cow milk production has been reduced from about 1,503 thousand tons in 1990 to about 443 thousand tons in 2017, or by more than three times. At the same time, the average annual milk production per cow after a decline in 1990-2000 has been steadily rising and is now close to the 1990s level (Table 1).

Table 1. Total cow milk production and average annual productivity, 1990-2017

Indicators	1990	1995	2000	2005	2010	2015	2016	2017
Total cow milk production, thous. tons	1,503	751	555	627	591	480	462	443
Average annual productivity (tons / cow)	3.7	2.0	2.0	2.7	3.7	3.7	3.6	3.6

Source: elaborated by authors based on NBS data [6]

The largest share of the milk production (around 95% in 2017) is provided by households. It should be noted that the volume of households' milk production is continuously decreasing from 576.4 thousand tons in 2010 to 418.4 thousand tons in 2017 or by 38%.

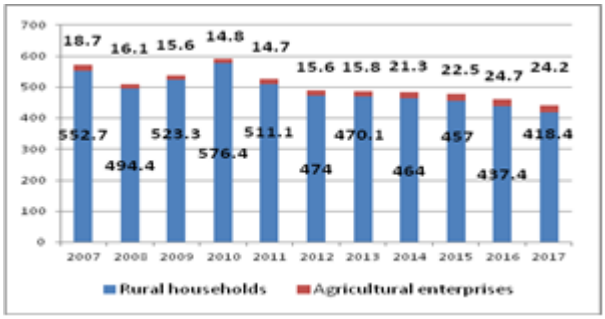

Fig. 4. Production of cow milk by types of households, 2007-2017, thousand tons
Source: elaborated by authors based on NBS data [6]

At the same time, milk production of agricultural enterprises after a period of growth in the years 2012-2016, signaled a decline in 2017 (Figure 4).

Concomitantly with decline of the number of milking cows and decrease of dairy production volume, the average productivity per cow has been steadily rising since 2000 in both, households and agricultural enterprises. Thus, the average annual productivity of agricultural enterprises in 2017 was about 4.2 tons, which is about by 5% above the level of 1990. At the same time, the average annual productivity of households increased from 3.0 tons in 1990 to 3.6 tons in 2017 or by around 21%. It is worth mentioning that in recent years, the average annual productivity in agricultural enterprises is higher than in households.

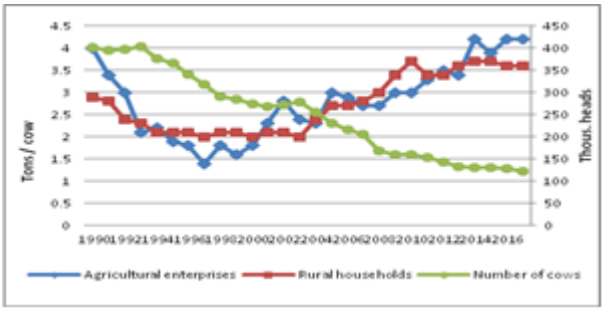

Fig. 5. Annual average milk productivity per types of households and the cattle herd, 1990-2017, tons / cow, heads

Source: elaborated by authors based on NBS data [6]

The rising productivity in recent years has somewhat amortized the reduction in milk production caused by the continuous decline of the milking cows herds since 1990 (Figure 5).

Households where most of the milking cows are currently kept, despite their high weight in the sector, cannot assure the right use of technologies necessary for cattle breeding, as they do not have enough possibilities to use necessary tools and technological equipment for the preparation and distribution of compound feed, mechanized milking and other cows' maintenance operations. Therefore, the milk produced in these farms is of unsatisfactory quality according to requirements of the processing enterprises. Another major deficiency of the households' milk production is the very pronounced seasonality, which leads to the overproduction of milk during spring and summer and a shortage of milk during the winter period. These fluctuations significantly affect the production process of the milk processing enterprises. A vulnerable point of milk production in households is the collection of milk and its transport as a raw material for milk processing enterprises. Livestock production in rural households also creates serious environmental pollution problems, including pollution of air and drinking water sources. At the same time, milk production in households represents an important source of income for a great part of the rural population. In this context, it is very important to stimulate investments in the creation of cattle farms near the villages, which will allow the use of modern technologies for maintenance, nutrition and exploitation of animals and thus significantly increase their productivity and obtain a competitive product on the domestic, as well as on export markets.

Purchase and processing of raw materials

Processing enterprises collect milk directly from farms, while milk produced in households is collected through collection points. Nowadays, 696 collection points are active, the majority of which belong to the processing enterprises, and 58 of them belong to other economic entities.

For milk collection points it is mandatory to implement hygiene requirements as well as HACCP preliminary programs, including traceability, endowment with laboratory equipment, including express tests for determination of antibiotics.

Milk purchase prices may range from 3.2 to 6.5 Moldovan lei per liter depending on the season, the processing enterprise and the collection point. Most of the milk is collected from March to September [4].

Many households sell milk and dairy products (sour cream, cow cheese, butter) obtained in homemade conditions on local agricultural markets. At the same time, milk processing enterprises lack the qualitative raw material. As a result, domestic milk production covers domestic consumption needs only at 83-90%

and in the last years there is a tendency of decreasing of the self-sufficiency level (Table 2).

Table 2. Milk consumption balance, 2009-2017, thous. tons, %

Elements of the balance	2009	2010	2011	2012	2013	2014	2015	2016	2017
Resources									
Production	575	591	560	525	527	525	520	504	485
Import	40	64	84	101	96	86	79	99	134
Stock variation	4	-13	-17	6	1	-9	9	4	-7
Total resources	**619**	**642**	**627**	**632**	**624**	**602**	**608**	**607**	**612**
Uses									
Export	14	14	18	13	17	21	27	50	33
Fodder	3	3	3	11	16	18	15	19	17
Loses									
Consumption of population	602	625	606	608	591	563	566	538	562
Total uses	**619**	**642**	**627**	**632**	**624**	**602**	**608**	**607**	**612**
Self-sufficiency level, %	95.0	94.1	92.0	84.7	86.8	90.4	89.5	90.5	83.8

Source: Source: elaborated by authors based on NBS data [7]

Nowadays, 29 milk processing enterprises hold a sanitary veterinary authorization, of which only 17 enterprises are operating.

The surplus of existing milk processing capacities and obsolete equipment generates considerable losses. As a result, the competitiveness of domestic dairy products both at the price and quality level is often below the level of import production.

At the same time, starting with 2009, already 6 dairy enterprises have implemented HACCP and another 5 enterprises have initiated the HACCP and ISO 22000 re-equipment and implementation procedures [4].

Table 3. Dairy production volume indices, 2008-2017, %, compared to the previous year

Product	2009	2010	2011	2012	2013	2014	2015	2016	2017
Milk and cream with fat content <6%, thous. tons	92.2	106.0	96.6	99.2	104.6	120.5	101.7	107.5	93.0
Milk and cream in solid form, tons	67.6	66.8	51.4	85.8	81.9	237.4	130.2	123.4	147.7
Butter, tons	88.0	109.9	92.4	97.1	110.5	112.4	102.4	122.6	81.3
Cheese and fat cheese, tons	52.0	135.9	117.3	101.2	115.2	99.7	101.7	97.3	119.4
Cured milk, creamy milk cream, yoghurt, kefir, cream and other fermented products, tons	102.2	104.7	106.6	100.0	110.6	104.4	103.5	100.3	95.0
Ice cream and other ice forms with or without cocoa, thousands of liters	93.0	117.1	99.1	113.6	107.8	103.1	102.1	103.2	103.0

Source: Source: elaborated by authors based on NBS data [6]

Dairy production volumes registered stable increases over the period 2013-2017 for most types of product. Production volumes increased significantly for "Milk and cream in solid form", "Butter" and "Cheese and fatty cheese" (Table 3). This phenomenon seems very interesting in the context of the continuous reduction of the volume of milk produced in the Republic of Moldova (Figure 4) and the high consumption of milk in dairy processing industry, so for the production of one kilogram of butter, about 22 liters of milk is used.

Exports and imports of dairy products

The volume of exports of dairy products from the Republic of Moldova registered a steady increase of about 2.4 times during the period 2013-2017.

During the same period, dairy imports increased by 2.1 times. The largest increases in import volumes were recorded for products of group 0401 "Milk and cream, not concentrated, nor containing added sugar or other sweetening matter" and group 0405 "Butter, including dehydrated butter and other fats derived from milk". The largest increases in dairy exports were recorded for products of group 0402 "Milk and cream, concentrated or containing added sugar or other sweeteners" and group 0406 "Cheeses and curd". At the same time, the balance of foreign trade of dairy products during this period was deeply negative, with the exception of the export of butter in the years 2015-2016. Being calculated in natural indicators, dairy imports

have exceeded exports by about 12 times in 2017 (Table 4).

Table 4. Export and import of dairy products, 2013-2017, tons, %

	2013	2014	2015	2016	2017	2017/2013, %
Products from group 0401						
Export	0	19	0	0	0	--
Import	5,398	9,005	6,182	14,170	23,397	433.4
Balance	-5,398	-8,986	-6,182	-14,170	-23,397	433.4
Products from group 0402						
Export	40	243	291	1,185	1,362	3,405,0
Import	2,947	2,861	2,598	2,879	2,250	76.3
Balance	-2,907	-2,618	-2,307	-1,694	-888	30.5
Products from group 0403						
Export	0	19	0	0	0	--
Import	4,379	3,988	4,348	4,675	5,218	119.2
Balance	-4,379	-3,969	-4,348	-4,675	-5,218	119.2
Products from group 0404						
Export	0	0	0	0	0	--
Import	434	514	530	406	784	180.6
Balance	-434	-514	-530	-406	-784	180.6
Products from group 0405						
Export	475	401	747	1597	542	114.1
Import	709	418	420	661	1626	229.3
Balance	-234	-17	327	936	-1084	463.2
Products from group 0406						
Export	773	877	1,050	999	1246	161.2
Import	3,795	3,343	3,167	3,693	3,900	102.8
Balance	-3,022	-2,466	-2,117	-2,694	-2,654	87.8
Total dairy products						
Export	1,288	1,559	2,088	3,781	3,150	244.6
Import	17,662	20,129	17,245	26,484	37,175	210.5
Balance	-16,374	-18,570	-15,157	-22,703	-34,025	207.8

Source: elaborated by authors based on UN Comtrade data [10].

Table 5. SWOT analysis of the dairy sector of the Republic of Moldova

Strengths
-The process of harmonizing the legal and normative framework in the field of milk production and processing has been initiated; -Favourable conditions for the cultivation of fodder crops needed for the growth of cattle; -Existing export of dairy products to CIS countries; -Human potential with experience in the field of milk production and processing
Weaknesses`
-95% of milk production comes from the individual sector -Insufficient production of qualitative milk -Only about 3% of the cow herds are of a certain breed -Low quality of feed -Lack of extension services in the milk production and processing sector -Lack of information necessary for business development in the dairy sector -Lack of innovation in the milk production and processing sector -Outdated technologies in the milk production and processing sector -Low competitiveness of the domestic dairy products -Lack of skilled labour force in the milk production and processing sector -Underused capacities in the milk processing sector -Limited subsidization of the milk production sector -The massive import of cheap dairy products from Ukraine and other countries -Significant seasonality feature of the of milk production -Lack of adequate marketing strategies at the sector level -Difficulties in accessing financial funds -Inefficient management of the artificial sowing system -Educational programs do not meet the needs of the sector -Lack of a national project to finance the development of the sector -Insufficient efforts to promote dairy exports to EU countries
Opportunities
-Increase of milk production to ensure internal consumption -Increasing exports to traditional markets and development of new markets, particularly those in the EU (diversification of export markets) -Development of traditional and regional products (diversification of products) -Replacing the dairy imports -Intensify the efforts of development of family milk farms (up to 50 heads). Development of clusters, production and marketing groups, and other forms of association
Threats
-Adverse climatic phenomena -Possibility of regional epizootic phenomena -Unfair competition from neighboring countries -Demographic processes that to the decrease in consumption

Source: elaborated by authors.

Milk represents a strategic food product due to its nutritional components. Development of the milk production can contribute to the alleviation of a range of problems such as: reduction of imports, ensuring food safety and security, increasing on–farm productivity, raising on-farm incomes, reducing post-harvest losses, ensuring fair prices for

agricultural commodities and quality milk products.

Despite the precarious situation in the dairy sector that can be observed from a long list of weaknesses mentioned in the SWOT analysis certain opportunities exist in order to solve at least partially some of the major problems faced by this sector.

A package of well targeted policies is necessary to be elaborated and urgently implemented in order to overcome existing problems of the dairy sector in the Republic of Moldova.

CONCLUSIONS

The number of milking cows has diminished by about 3.6 times between 1990 and 2017, from 402 to 112 thousand heads and this process is steadily declining.

About 91% of milking cows are kept in households with an average of 1-2 cows and only 9% of this herd is grown within agricultural enterprises.

Milk production declined by 3.4 times from 1503 to 443 thousand tons in the same period, and this process is also steadily declining. At the same time, milk production in agricultural enterprises has been increasing since 2012.

Productivity, after a period of decline in 1990-1995, has stabilized between 1996 and 2004 and has started to rise since 2005, thus exceeding nowadays the level from 1990.

Domestic milk production covers domestic consumption needs at only 83-90% and in the last years there is a tendency of decreasing the self-sufficiency level.

Dairy production registered stable increases during the period 2013-2017 for most types of products, despite the continuous decrease of the volume of milk produced in the Republic of Moldova.

The balance of foreign trade in dairy products is deeply negative for all categories of dairy products, with the exception of butter exports in the years 2015-2016. In 2017, imports of dairy products calculated by natural indicators exceeded exports by about 12 times.

REFERENCES

[1]Fedorciucova, S., Calmas, V., Damaschin, M., 2017, Situația actuală privind producerea, comercializarea și asigurarea calității produselor lactate în Republica Moldova (Actual situation regarding producing, commercialization and quality assurance of dairy products in the Republic of Moldova). Journal of Research on Trade, Management, and economic Development, Volume 4, issue 2(8), p. 67 – 79.

[2]Ignat, A., 2013, Rolul instituțiilor în dezvoltarea sectorului de producție a laptelui (The role of the institutions in the development of milk producing sector). Analele Institutului de Economie, Finanțe și Statistică (Annals of the Institute of Economy, Finance and Statistics) Ediția a III-a. (3rd Ed) p. 66 – 68.

[3]Ignat, A., Ghițiu, L., 2012, Exportul și importul produselor lactate în țările Uniunii Europene (Export and import of dairy products in the European Countries), Economie și Sociologie (Economy and Sociology), no. 1, IEFS, Chisinau.

[4]MARDE, 2018, Information provided by the Ministry of Agriculture, Regional Development and Environment of the Republic of Moldova, Chisinau, Unpublished.

[5]NBS, 2018, Anuarul Statistic al Republicii Moldova 2018. Chişinău (Statistical Yearbook of the Republic of Moldova), 2018, Chisinau.

[6]NBS, 2017, Statbank database. http://statbank.statistica.md/pxweb/pxweb/ro/40%20Statistica%20economica/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774, Accessed on: 05.12.2018

[7]NBS, 2018, Official web page. http://www.statistica.md/category.php?l=ro&idc=129& Accessed on: 06.12.2018

[8]Prohnitchi, V., 2017, Moldovan dairy: the difficult way towards the EU market. https://www.expert-grup.org/media/k2/attachments/Studiu_industria_lactatelor.pdf, Accessed on: 22.11.2018.

[9]Stratan, A., Ignat, A., Aculai, E., 2011, Perspectivele dezvoltării sectorului de lactate în Republica Moldova (Perspectives of the development of the dairy sector in the Republic of Moldova). The Research Institute for Agriculture Economy and Rural Development. International Symposium. Agrarian Economy and Rural Development: Realities and Perspectives for Romania. Proceedings. Bucharest, p. 216 – 221

[10]UN Comtrade, 2018, http://comtrade.un.org/, Accessed on: 12.12.2018.