Investments of Milk Processing Capacities from Romania, through the Funds Provided by the “NPRD 2014-2020”

Vladu Marius¹ and Panzaru Radu Lucian²

1. Department of Agricultural and Forestry Technology, Faculty of Agronomy, University of Craiova, Craiova 200421, Romania

2. Department of Land Management, Measurements and Mechanization, University of Craiova, Craiova 200421, Romania

Abstract: In this paper, an analysis of the possibilities of development of milk processing activity was made, using as financing source the public funds provided by the Common Agricultural Policy and the distribution of the investments in Romania. All the EU member states gain 99.6 billion through the European Agricultural Fund for Rural Development, the period 2014-2020, of which Romania has received the total of 8.128 billion euros. Through the 2014-2020 National Rural Development Program (NRDP 2014-2020), sub-measure 4.2 “Support for investment in processing/marketing of agricultural products” (2014), Romania is falling Regulation (EC) 1305/2013 in measure 4 “Investments in physical assets” (2013) and contributes to increasing the value added of products on local markets and inter-professional organizations, the establishment and development of small businesses and job creation. Until now, in the milk processing sector, investments of 93,918,043 euros were made, about 50% (47,667.41 euros) of which from public funds.

Key words: Public funds, investment, processing, milk.

1. Introduction

According to the Regulation of the European Council No. 1290/2005 [1], on the financing of the common agricultural policy, two European funds for agriculture have been created called European Agricultural Guarantee Fund (EAGF) to finance marketing measures, and European Agriculture Fund for Rural Development (EAFRD) to finance rural development programs.

Member states shall carry out, in accordance with the provisions of Article 55 of Regulation (EC) No. 1303/2013 [2] evaluations in order to increase the development of each program. These assessments fall under the responsibility of the authority responsible for preparing rural development programs.

After joining EU, Romania ranks the 10th place for the number of dairy cows and the 19th of the total

milk production, which shows a significant gap in the yields of cow per year according to the notes of Zahiu et al. [3].

Regarding the importance of milk, Georgescu et al. [4] said that milk was a food of important strategic purposes, because it contributed to improving the quality of life and ensuring food security being fed completely of first necessity.

Milk producers and milk processors are inextricably linked and are dependent on each other. However, their interests are conflicted, since they have to negotiate the price, which means that their bargaining position has a strong impact on their profitability, according to Jaksic et al. [5]. Regarding the trend of trade in milk and milk products, imports from extra-EU are generally fairly flat, while exports to extra-EU are steadily growing, even though the price of exports falls, based on the study of Mach and Hoskova [6].

Popescu [7] said that due to the lack of raw milk,

Corresponding author: Vladu Marius, associate professor, research fields: agricultural economics, extension and rural development.

processors were obliged to buy raw milk from other countries. Romanian producers received a low milk price at farm gate, meaning losses and efforts to produce more milk to maintain income level and to sell milk in Bulgaria. Doluschitz [8] anticipated that the current EU milk quota system will most likely be terminated in 2015. This requires adaptation measures by the milk producers, as well as the milk processors.

Concerning new Common Agricultural Policy (2014-2020) for the milk sector, which Mariana [9] remarked will have the removal of milk quotas after 2014 as a main component, represents both a challenge and a threat for the Romanian farmers, whose raw milk prices may decrease, resulting in great losses.

For European dairy producers, the slight decline in demand for dairy products in the EU and the rapid increase in milk production in several member states since the abolition of milk quotas in 2015, are the real threat, as mentioned by Chatellier [10].

It is important to highlight how to use the financial resources and how they are related to the needs and specific situation in the territory, so that it becomes noticeable of how to use the non-reimbursable funds.

2. Materials and Methods

Within sub-measure 4.2, investments in the entire territory of Romania are supported. A project may include both eligible and ineligible expenditure. The non-reimbursable funds will be granted only for the settlement of eligible expenditure, ineligible costs to be borne by the project beneficiary. Non-reimbursable funds will be granted to eligible beneficiaries for tangible and/or intangible investments. The expenses generated by the investments in intangible assets are: organizing and implementing quality management and food safety systems if they are related to the project's physical investments; technology acquisition (know-how), patents and licensing of project implementation; the acquisition of software, identified as necessary in the technical and economic

documentation of the project; eligible marketing costs of the products obtained (the establishment of the site—in order to promote and market their own products; etiqueting—increasing the concept; creation of registered trademark/brand). The costs of the project's overall costs are: consultancy, design, monitoring and management costs, including fees for environmental and environmental sustainability advice, license fees, under Article 45 of Regulation (EC) No. 1305/2013 [11], as well as those regarding the obtaining of approvals and authorizations necessary for the implementation of the projects, stipulated in the national legislation.

In this paper, a statistical study was carried out to highlight the investments made under sub-measure 4.2 of the 2014-2020 National Rural Development Program (NRDP 2014-2020), on the survey period 2015-2016 [12], investments made for the development of milk processing units.

The data used for this study were obtained from various sources, and the most relevant ones are derived from the selection reports published by the contracting authority.

The methodology used to draw up this paper is the secondary analysis of existing national and European data on the state of absorption of structural funds of Ministry of European Funds (MEF), Government of Romania. Thus, the following types of documents were studied: (1) reports on the state of absorption of structural and cohesion funds, on each operational program of MEF; (2) report on the status of submission and approval of projects, signing of financing contracts and making payments to beneficiaries—Authority for the Coordination of Structural Instruments (ACSI); (3) data on Romanian GDP and population—Eurostat and the National Institute of Statistics; (4) official statements and notices—MEF and Government of Romania.

To highlight the correlation between: (I) no. of animals (x) and total milk production (y); (II) no. of animals (x) and eligible project value (y); (III) total

milk production (x) and eligible project value (y), at regional level. Eq. (1) for the correlation coefficient:

$$\text{Correl. } (x, y) = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}} \quad (1)$$

where, $\bar{x}$ and $\bar{y}$ are the averages for samples, average (matrix1) and average (matrix2).

3. Results and Discussion

Investments in the processing industry will aim to reduce the footprint on the environment, by encouraging new methods of storing agri-food production to increase food safety, products that are better suited to market requirements, methods of waste use and water treatment to protect the environment.

In a context of multiple crises, Feyereisen et al. [13] mentioned that dairy farmers struggled to receive a fair remuneration for their work. This situation leads to the creation of fair milk projects in Europe. And Becker et al. [14] said that economic success in processing was greatly contingent upon individual business, financial management and marketing skills. Trading options is a gambler's bet, but for math-minded investors, they can also provide a steady and relatively safe source of income, as said by Dobosz [15].

The support granted under sub-measure 4.2 through

individual and/or collective investments will lead to the development and modernization of agricultural processing and marketing capacities, compliance with community standards, including modern technologies, new innovations and ideas, as well as facilities to increase the efficiency and productivity of businesses and the added value of agricultural products. Storage and packaging facilities, quality management systems, environment-friendly systems, labeling, promotion and marketing are all within food chains.

The financial contribution of the beneficiaries varies between 30% and 50%, depending on the extent to which the applicant is eligible and has decided to apply. Although there is a serious obstacle to non-reimbursable funding, co-financing will be the responsibility of the beneficiary.

In order to highlight the necessity of investing in the milk processing sector, the potential existing in Romania (2014, the reference year for future investments) was being first looked at in terms of the dairy herd, total milk production and under the trade balance of milk and milk products.

Fig. 1 showed livestock and milk production by development regions (eligible for funding for 4.2 sub-measure). The North East, North West and Center regions are predominant (areas with strong tradition

Fig. 1 The situation of livestock (thousands heads) and milk production (thousand hL), by regions of development (2014). Source: [16]

and favorable climate, where the herds exceed 200 thousands heads/region), while the rest of the regions are registering lower numbers (between 92 thousands heads/region and 144 thousands heads/region).

And in terms of milk production, the situation is similar to values between 10,906 and 7,560 thousand hectoliters in the North East and Center regions. The rest of the regions did not exceed the threshold of 5,200 thousand hectoliters.

Milk and milk products exported from Romania (milk; cream not concentrated, whether or not containing added sugar or other sweetening matter; sourdough; curdled milk and cream; yogurt; kephir and other fermented or acidified milk and cream concentrated, containing added sugar or other sweetening matter or flavored) reached in 2014 a value of 83,449 thousand dollars. Imports, for the same products, amounted to 136,352 thousand dollars. As a result, in 2014, the balance of trade balance was negative at USD -52,903 thousand, according to the site <http://statistici.insse.ro/shop/> [16]. In this context, a study is needed to analyze the situation of investments in the field and the conclusions and recommendations to stimulate this sector.

Table 1 highlighted the fact that in Romania,

through NRDP 2014-2020 in the period 2015-2016, 57 projects were selected, the soups are as follows: 22 projects in region 6—North West, eight projects in regions 3—South Muntenia, South West Oltenia; five projects in regions 1, 2 and 7—North East, South East and Center; four projects in region 5—West.

Regarding the data in Table 2, it was found that in 2015, investments were made in five out of the seven development regions, with a total eligible value of 44,178,124 euros, out of which 21,919,032 euros (non-reimbursable) were public value. The eligible value was between 4,208,931 euros in the West region and 12,380,404 euros for the North West region.

In terms of public value, the limits were 2,104,465 euros in the West region and 6,041,895 euros in the South Muntenia region. This year, no projects were funded in the South West Oltenia and Center regions.

For the year 2016, the total eligible project value was 49,739,919 euros, with limits of 4,210,236 euros in the West region and 18,586,685 euros in the North West region. The total public value reached 25,748,379 euros with values between 2,315,517 euros and 9,594,344 euros in the West and North West, respectively.

The evolution in the dynamics of the volume of investments (2015-2016) highlights the increase of the

Table 1 Numerical situation of selected projects at national level.

Year	Region							Total
	1. North East	2. South East	3. South Muntenia	4. South West Oltenia	5. West	6. North West	7. Center	
2015	5	5	8	0	1	12	0	31
2016	0	0	0	8	3	10	5	26
Total	5	5	8	8	4	22	5	57

Table 2 Value situation of selected projects at national level (euros).

Year	Value	Region							Total
		1. North East	2. South East	3. South Muntenia	4. South West Oltenia	5. West	6. North West	7. Center	
2015	Eligible	9,416,880	6,088,119	12,083,790	0	4,208,931	12,380,404	0	44,178,124
	Public	4,708,440	3,044,058	6,041,895	0	2,104,465	6,020,174	0	21,919,032
2016	Eligible	0	0	0	18,093,625	4,210,236	18,586,685	8,849,373	49,739,919
	Public	0	0	0	9,416,812	2,305,517	9,594,344	4,431,706	25,748,379
Total	Eligible	9,416,880	6,088,119	12,083,790	18,093,625	8,419,167	30,967,089	8,849,373	93,918,043
	Public	4,708,440	3,044,058	6,041,895	9,416,812	4,409,982	15,614,518	4,431,706	47,667,411

eligible values (+12.59%) and public (+17.47%) at national level. According to development regions, investments in North West, South West Oltenia and Center are increasing (in the last two situations, investments were not made at the level of the year 2015). For the West, North East, South East and South Muntenia regions, the value of investments decreased in different proportions (no investment was made in the last three cases).

Analyzing the total value of the investments, there are eligible funds of 93,918,043 euros and public funds of 47,667,411 euros found. The situation per region highlights the following: in the case of eligible funds, the variation limits were 6,088,119 euros in the South East region (6.48% of the national total) and 30,967,089 euros in the North West region (32.97%

from the national level); at the level of the public funds, the extreme values were 3,044,058 euros and 15,614,518 euros for same regions as in the previous case (national shares of 6.38% and 32.75%, respectively).

As a result of these analyses or some inconsistencies in the investment dynamics (regions with increasing or decreasing growth), some correlations that were highlighted in Table 3 were being looked for.

There is a direct correlation between livestock and milk production, which results from the value of r (0.998093), and of R^2 for linear function and polynomials of degree 2 (0.9962 and 0.9992, respectively) as illustrated in Fig. 2.

Between the animal eve and the eligible value of the projects, in the present case, there is no tight link,

Table 3 Values of regression coefficient and of R^2 —2014 by development regions.

Correlation	r	R^2 Linear function	R^2 Polynomial function grade 2	R^2 Polynomial function grade 3	R^2 Polynomial function grade 4	R^2 Polynomial function grade 5
Effective livestock —total production	0.998093	0.9962	0.9992	-	-	-
Effective animals —valuable projects eligible	0.203953	0.0416	0.1769	0.2846	0.6072	0.7737
Total production —valuable projects	0.193077	0.0373	0.2259	0.3084	0.6900	0.8187

Fig. 2 Correlation between livestock (heads) and milk production (thousand hL).

an aspect underlined by the values of the coefficients r (0.203953) and R^2 . Since the values of R^2 were: 0.0416—linear function, 0.1769—polynomial grade 2, 0.2846—polynomial grade 3, 0.6072—4th grade polynomial function (Figs. 3 and 4).

Starting with grade 5 polynomial function ($R^2=0.7737$), it can be stated that there is a correlation between the aspects studied (Fig. 4).

Between milk production and the eligible value of

the projects, in this case, there is no tight connection, an aspect underlined by the values of coefficients r (0.193077) and R^2 . Since the values of R^2 were: 0.0373—linear function, 0.2259—polynomial grade 2, 0.3084—polynomial grade 3, 0.6900—polynomial function grade 4 (Figs. 5 and 6).

Starting with the 5th grade, polynomial function ($R^2=0.8187$), it can be stated that there is a correlation between the aspects studied (Fig. 6).

Fig. 3 Correlation between livestock (heads) and eligible project value (euros) by linear function and polynomial level 2 function.

Fig. 4 Correlation between livestock (heads) and eligible project value (euros) through the polynomial functions of fence 3, 4 and 5.

Fig. 5 Correlation between milk production (thousand hL) and eligible project value (euros) by linear function and polynomial level 2 function.

Fig. 6 Correlation between milk production (thousand hL) and eligible project value (euros) through the polynomial functions of fence 3, 4 and 5.

4. Conclusions

In Romania, through NRDP 2014-2020 in the period 2015-2016, 57 projects were selected, most of them being in the north west region (22 projects) with an eligible value of €30,967,089.00 and publishing €15,614,518.00, and the few being in west (four

projects) with an eligible value of €8,419,167.00 and publishing €4,409,982.00. The total eligible amount was €93,918,043.00, out of which public funds was €47,667,411.00 (the co-financing rate being around 50%).

In the existing situation, there is a direct correlation between the livestock and the total milk production

fact confirmed by the values of r and R^2 .

The level of investments made (number of projects and eligible value) is not in line with the production potential of the development regions (the values of r and R^2 for the correlations between the livestock population and the eligible value of the projects, the milk production and the eligible value of the projects).

In order to improve Romania's position on the international market, including extra-community, milk and dairy products, it's recommended the development of investments in the field, by means of appropriate information actions of the economic operators (animal breeders and existing or start-up processors) non-reimbursable funds, as well as a better reinforcement in the territory of investments (correlation with productive potential) influenced by sectoral policies.

References

- [1] Official Journal of the European Union. “L 209/1. Regulation (EC) No. 1290/2005 of 21 June 2005 on the Financing of the Common Agricultural Policy.” Accessed September 8, 2017. <https://publications.europa.eu/ro/publication-detail/-/publication/3771377d-d07c-4f55-ad5e-956ccf41253b/language-ro>.
- [2] Official Journal of the European Union. “L 347/320. Regulation (EU) No. 1303/2013 of the European Parliament and of the Council of 17 December 2013.” Accessed September 12, 2017. <http://www.fonduri-structurale.ro/documente-utile/14/regulamentele-privind-fondurile-europene>.
- [3] Letiția, Z., Dachim, A., Manole, V., Ion, R., Popescu, A., Istudor, N., and Poenaru, S. 2006. *Agriculture of the European Union under the Impact of the Common Agricultural Policy*. Bucharest: Ceres.
- [4] Georgescu, G., Banu, C., Mărgineanu, G., Păsat, G. D., and Dorin, S. 2005. *Milk Manufacturer and Processor Book*. Volume IV. Bucharest: Ceres.
- [5] Jaksic, D., Mijic, K., Zekic, S., and Poljasevic, J. 2015. “Comparative Profitability Analysis of Milk Production Companies to Milk Processing Companies in Serbia.” *Custos e Agronegocio Online* 11 (3): 206-26.
- [6] Mach, J., and Hoskova, P. 2016. “Trends in the EU Trade of Dairy Products.” In *Proceedings of the 25th International Scientific Conference—Agrarian Perspectives XXV: Global and European Challenges for Food Production, Agribusiness and the Rural Economy*. Prague: Czech University of Life Sciences, 175-83.
- [7] Popescu, A. 2017. “Trends in Milk Market and Milk Crisis Impact in Romania.” *Scientific Papers. Series “Management Economic Engineering in Agriculture and Rural Development”*. Univ. Agricultural Sciences & Veterinary Medicine. Volume 17, Issue 2, 281-9.
- [8] Doluschitz, R. 2009. “The European Dairy Market in Transition—New Challenges for Dairy Farmers and Dairy Cooperatives in Baden-Wurttemberg.” *Berichte Uber Landwirtschaft-Hamburg* 87 (2): 197-213.
- [9] Grodea, M. 2014. “The Critical Milk Evolution after Quota Removal, Globalization and Intercultural Dialogue: Multidisciplinary Perspectives—Economy and Management.” In *Proceedings of the 2nd International Conference on Globalization, Intercultural Dialogue and National Identity*. Târgu Mureș, Romania: Arhipelag XXI Press, 744-54.
- [10] Chatellier, V. 2016. “International, European and French Trade in Dairy Products: Trends and Competitive Dynamics.” *INRA Productions Animales* 29 (3): 143-62.
- [11] Official Journal of the European Union. “L 347/487, Regulation (EU) No. 1305/2013 of the European Parliament and of the Council of 17 December 2013.” Accessed September 10, 2017. <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32013R1305&from=RO>.
- [12] Ministry of Agriculture and Rural Development. “National Rural Development Program for 2014-2020.” Accessed September 15, 2017. <http://www.madr.ro/docs/dezvoltare-rurala/programare-2014-2020/programa/>.
- [13] Feyereisen, M., Stassart, P. M., and Melard, F. 2017. “Fair Trade Milk Initiative in Belgium: Bricolage as an Empowering Strategy for Change.” *Sociologia Ruralis* 57 (3): 297-315.
- [14] Becker, K. M., Parsons, R. L., Kolodinsky, J., and Matiru, G. N. 2007. “A Cost and Returns Evaluation of Alternative Dairy Products to Determine Capita Investment and Operational Feasibility of a Small-Scale Dairy Processing Facility.” *Journal of Dairy Science* 90 (5): 2506-16.
- [15] Dobosz, J. 2017. “Milking Your Stocks.” *Forbes* 199 (7): 132.
- [16] Institutul Național de Statistică. Accessed September 2, 2017. <http://statistici.insse.ro/shop/>.