

## OPPORTUNITIES FOR DEVELOPMENT OF ORGANIC MILK PRODUCTION AND PROCESSING IN LATVIA

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**Abstract.** Organic dairy farming is the dominant organic livestock sector in Latvia. More than 50 % of organic milk farms producing organic cow milk are located in Latgale statistical region; yet, no organic dairy processors are located there. The aim of this study is to investigate and evaluate organic dairy production and its development possibilities in Latvia. The authors have applied the Analytical Hierarchy Process (AHP) method to select one of the three proposed scenarios as the most appropriate for the development of dairy processing. Children are the next generation of Latvia, thus, they should be provided with the best and most natural food – organic dairy products. This assumption was also confirmed by the experts' opinions in scope of the Analytical Hierarchy Process study. The research gave evidence that dairy processors would be more interested to maintain eco-product lines and organic dairy farms as well as actively cooperate if policy makers ensured that pupils of general education institutions would be supplied with 100 % organic milk and other dairy products by 2025.

**Keywords:** organic milk, dairy farming, milk production and processing.

### Introduction

Sustainable development of national economy is a precondition for wealth of the society [1]. The demand for food produced without using pesticides, mineral fertilisers and GMO is increasing with every year not only in Latvia but also in the two most significant organic food markets – the European Union and the USA [2]. This ensures the growth of organic food market by 10-15 % annually [3]. Dairy industry is the dominant livestock industry of organic farming. In 2013, the organic dairy output was 69.9 thousand tons of organic milk – 69 thousand tons of cow milk and 0.6 tons of goat milk [4]. However, in 2013, companies processing organic milk obtained 2037.5 tons of organic milk and dairy products constituting only 2.93 % of total organic milk outcome. Such situation can be explained by the fact that only 29.9 % of the produced organic milk was supplied as organic milk [5].

The research *hypothesis*: supply of general education institutions with 100 % organic milk products may enhance the production and processing of organic milk in Latvia. The *aim* of the present paper is to investigate and evaluate the opportunities for organic milk production and processing in Latvia. The research *tasks* are: 1) to characterise the theoretical aspects of organic milk production and processing in Latvia; 2) to summarise the legal guidelines for organic milk production and processing; 3) to evaluate the development trends and problems of organic milk production and processing; and 4) to elaborate and evaluate the development scenarios for organic milk processing in Latvia.

### Materials and methods

The following economic research methods were applied for the research purpose: monographic method for the studies of theoretical and legal aspects of organic milk production and processing; graphical and time series method for the description of organic milk production and processing trends; content analysis – for the identification of topicality of organic milk production; scenarios method and analytical hierarchy process method – for the detection of the development possibilities for organic milk processing.

For secondary data analysis, the authors have used the publications from EBSCO and Science Direct databases as well as other research data available on the Internet; books; the European Commission and European Council documents; the laws and the Regulations of the Cabinet of Ministers of the Republic of Latvia; the data of the Central Statistical Bureau of the Republic of Latvia and Eurostat database; strategic development and planning documents as well as information aggregated by the Agricultural Data Centre (LDC) of the Republic of Latvia and the Latvia Organic Agriculture Association (LBLA). The guidelines for producing and processing organic milk, labeling and importing to the third countries are determined in the European Union legal enactments, which are mandatory for each natural and legal person planning to become an organic producer or processor of organic products.

The legal regulation for organic production and processing is covered by:

a) the EU regulatory enactments:

- Regulation of the European Council (EC) No 834/2007 of 28.06.2007;
- Regulation of the European Commission (EC) No 889/2008 of 05.09.2008;
- Regulation of the European Commission (EC) No 1235/2008 of 08.12.2008.

b) Regulations of the Cabinet of Ministers of Republic of Latvia No 485 “Procedure for Organic Farming Supervision and Control”.

To become an organic agriculture producer/processor, it is necessary to obtain an appropriate certificate that complies with the Regulation of the Council (EC) No 834/2007 and Regulation of the Commission (EC) No 889/2008. In Latvia, organic agriculture certification is implemented by the State Ltd “Certification and Testing Centre” and the certification institution “Vides kvalitāte” (Quality of Environment).

## Results and discussion

Nowadays, generally it is possible to highlight the development of conventional (traditional) or industrial agriculture and also integrated agriculture. In conventional dairy agriculture, cows can be fed by fodder that contains GMO, e.g., soy and maize; whereas in organic farming it is forbidden to feed cows with fodder containing GMO. The animal welfare requirements are much stricter in organic milk livestock than in the traditional one, for example, it is not allowed to burn horns, it is necessary to ensure walking fields and pastures. On organic dairy farms, cows are kept in compliance with the organic production principles, which do not aspire to obtain as high milk yield as possible in contrast to conventional dairy farms that practice it purposefully.

The result of organic farming is not only availability of healthy food but also sustainable, natural environment that ensures high quality of life not only for people but also for plants and animals.

If in 2000 there were only 78 farms registered in Latvia, then within the next 13 years this figure increased to 3.5 thousand of certified organic farms. The largest increase was registered in 2005, when the number of certified organic farms rose 2.8 times compared with 2004, which could be explained by Latvia’s accession to the EU in 2004 and the EU support for the promotion of organic farming (Fig. 1).

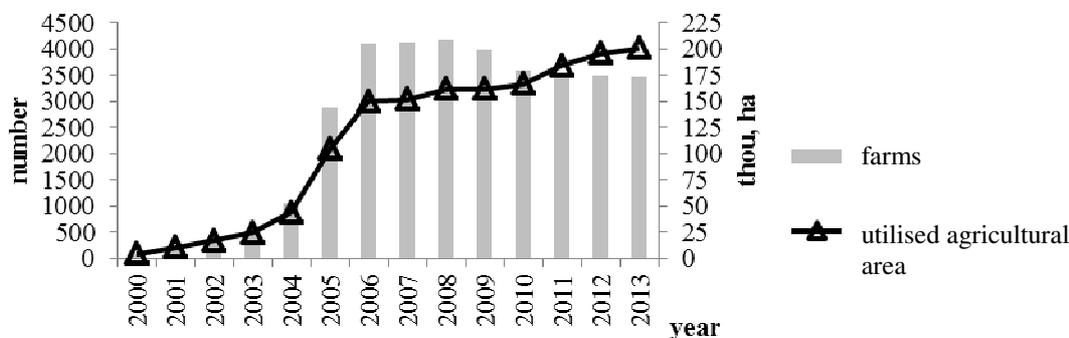


Fig. 1. Number of certified organic farms and certified organic agricultural land areas in Latvia between 2000 and 2013, [6]

Compared with the other Baltic States, in 2013, there were 1553 organic farms registered in Estonia [7; 8], while 2555 organic farms – in Lithuania [9].

The areas of certified organic farmlands in Latvia continued to increase annually with the simultaneous decrease in the number of certified organic farms from 2009 to 2011, thus, reaching 200.43 thousand ha in 2013 and accounting for 11 % of the utilised agricultural area. This indicator ranks Latvia in the fifth place in the EU by the proportion of organic land of the total land used in agriculture. In Estonia, this indicator is respectively – 151.26 thousand ha and accounts for 16 % but in Lithuania – 166.33 thousand ha and accounts for 5.7 % [7; 10].

Organic agriculture provides such products as honey, milk, meat, cereals, vegetables, berries and fruits. As it is shown in Fig. 2, the largest share of Latvian organic products is made up of milk. In 2013, milk production amounted to 69.6 tons, of which 69 tons accounted for cow milk and 0.6 tons for goat milk [4].

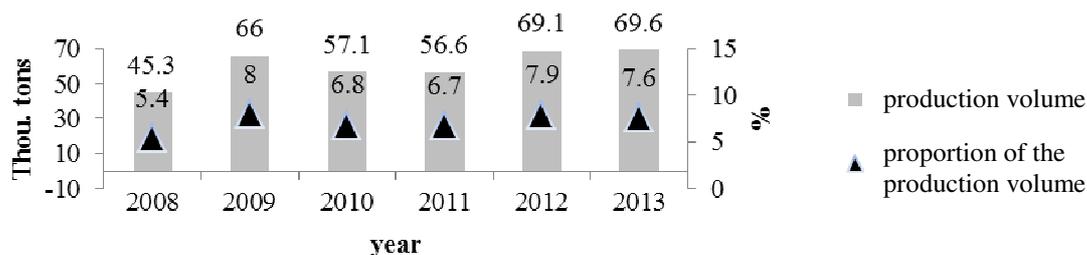


Fig. 2. **Organically certified milk production volume and share in the total volume of milk produced in Latvia between 2008 and 2013, [6]**

In Latvia, production of organic milk volume has been fluctuating between 2008 and 2013. In 2009, its volume increased to 66 thousand tons, yet it decreased in the following year, which could be explained by the economic situation not only in Latvia but also in Europe and other countries of the world. The output of organic milk within the total volume of milk produced from 2008 to 2013 did not exceed 8 %. The fluctuations of organic milk output in Latvia were mainly influenced by the production capacities of organic milk and changes in the number of certified farms. In 2013, the share of organic milk production increased by 2.2 percentage points compared with 2008 and accounted for 7.6 % of total milk production in Latvia.

Latgale statistical region is important in terms of organic milk production, since 57 % of Latvian certified organic milk producers are registered there. Vidzeme region ranks the second with 22 % followed by Kurzeme, Zemgale and Pierīga statistical regions.

The authors have summarised and analysed the Agricultural Data Centre (hereinafter LDC) monitoring results on 662 organic cow milk producers for the period of 2013-2014 to further characterise the organic cow milk producers in Latvia.

The average milk yield per cow in organic farms during the monitoring period of 2013-2014 reached 5771 kg, while the overall average milk yield per cow in Latvia (both organic and conventional farms) in 2013 increased by 4.9 % compared with 2012, thus, amounting to 5508 kg [4].

During the monitoring years of 2013-2014, 35 % of organic farms milked from 5001 kg up to 6000 kg of milk per cow on average; 28 % - from 6001 kg to 7000 kg, whereas 58 farms or 9 % of all farms milked from 7001 kg to 8000 kg of milk; and 2 % of the organic dairy farms milked more than 8001 kg of organic milk per cow (Fig. 3).

The average number of registered cows on organic farms in the monitoring period of 2013-2014 was 18; while the number of registered cows in 77 % of the farms under the supervision ranged from 6 to 49 cows, and only 17 % of the farms held no more than 5 cows. During the monitoring period of 2013-2014, 1 % of the farms had more than 100 registered cows. Moreover, according to the authors' personal information, there are four farms operating in Latvia, which have more than 200 cows. These farms produce organic milk in Koknese, Ventspils, Kuldīga and Krāslava counties.

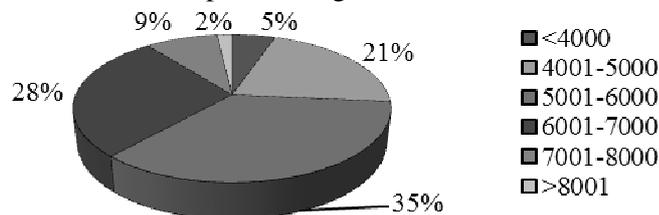


Fig. 3. **Structure of organic farms by the average milk yield of cows in Latvia, LDC data on 30.09.2014, %, N = 662 [5]**

Latvian dairy industry is fragmented, which is characterised by a very large proportion of farms with a small number of cows. In 2013, the average number of cows in the herd was 7 cows; whereas, small farms with 1-5 cows made up 79.5 % of all farms [4].

In 2009, there were 13 companies and farms dealing with organic milk processing in Latvia. During the four years, the number of companies has fluctuated - in 2013, there were 17 processing companies registered, while in 2014 - 19 companies [5]. On 17 March 2015, the information obtained by the authors from the Food and Veterinary Service (PVD) on recognised and registered organic farmers indicated that there were 23 organic milk processors in Latvia (Fig. 4).

Although, the number of registered and recognised companies producing organic milk in Latvia has fluctuated between 2009 and 2013, the processed organic milk volume in 2013 amounted to 2037.5 tons, which could be explained by the increase in the number of organic milk producers and the increased production capacity of processing companies in Latvia.

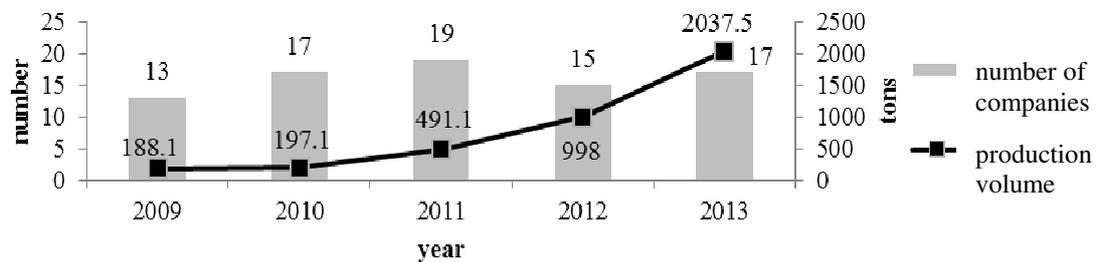


Fig. 4. Number of organic milk processors and processed output in Latvia between 2009 and 2013, tons, [5]

The location of organic milk processing companies within the territory of Latvia gives evidence of insufficient opportunities for organic milk processing in the country. As three of the four organic cow milk processing companies are located in Kurzeme and Pieriga regions, the authors believe that Vidzeme and Latgale organic milk producers are forced to sell their organic milk as conventional milk.

In scientific research the scenario method can be used to forecast future.

In 2011, R. Zanoli, D. Gambelli and D. Vairo developed scenarios for predicting the organic food market development in Europe [2]. The scenario method is suitable to forecast the organic dairy development also in Latvia and to select the best option focusing on the primary objective: the growth of organic dairy industry in Latvia.

The authors have proposed three scenarios to achieve this primary objective:

- cooperation scenario;
- eco line scenario;
- public procurement scenario.

To determine the most appropriate scenario, the authors present a brief overview of each scenario emphasising its positive and negative aspects.

**Scenario A: Cooperation scenario.** In scope of the cooperation scenario, an agricultural services co-operative society is established in Latgale region, namely, in Rezekne county bordering with Dagda, Balvi, Madona and other provinces. Positive aspects: the decision-makers are organic milk producers themselves; they can attract funding from the national development financial institution “Altum” and the EU. Negative aspects: problems with a successful brand development for attracting consumers; the initial production capacity cannot satisfy the demand of supermarkets.

**Scenario B: Eco line scenario.** In scope of the eco line scenario, the JSC “Smiltene piens” and the JSC “Preilu siers” establish a separate organic milk processing line with the intention to purchase organic milk as raw material from Latgale and Vidzeme organic dairy farms. Positive aspects: high brand awareness of the existing conventional products produced by these companies. According to the magazine “Forbes”, the brand “Smiltene” of the JSC “Smiltene piens” is ranked in the 16th place, while the brand “Latgale” of the JSC “Preilu siers” - in the 25th place in the list of Latvian most popular brands [11]. Negative aspects: large financial investments are necessary to create an eco-line; additional costs for other additives – sugar and starch imports.

**Scenario C: Public procurement scenario.** In scope of this scenario, the legislation of the Republic of Latvia prescribes that general education institutions are to purchase only organic dairy products until 2025. Positive aspects: an additional support instrument for organic milk producers and processors, an opportunity to promote “green” procurement. Negative aspects: “the lowest price” principle in the public procurement, increase in the local government spending.

The analysis of other countries’ experience shows that, e.g., schools of the Swedish city Malmö are ensured with 40 % of organic food, in Rome (Italy) – 69 %; whereas Denmark has already stated that 90 % of public procurement food products consist of organic food [12; 13].

The authors invited four experts to participate in the Analytical Hierarchy Process (AHP) research procedures to evaluate the proposed three scenarios. This method is intended for complex decision making. The essence of the method lies in systemic hierarchical arrangement of the problem elements. The problem is gradually divided into several simpler parts that are compared eventually in pairs, thus, assessing the level of the problem elements' interaction in hierarchy. The interests of all the stakeholders of the analysed problem are respected, since the AHP intends to involve several experts in assessing priorities. The evaluations of the experts are presented in numerical values using a relative importance scale [14]. The four experts were: 1) a farm owner, who operates with organic production methods in dairy farming and crop production and is a member of the Latvia Organic Agriculture Association; 2) a project manager of the Latvia Rural Advisory and Training Centre and expert in organic farming; 3) a young mother; 4) a master's student of economics with specialisation in marketing and industry economics.

After summary of the experts' evaluations obtained by using the AHP method, the experts selected the public procurement scenario as the most suitable scenario for the development of organic dairy industry in Latvia (global priority vector – 0.40), followed by the cooperation scenario (0.35) and the eco-line scenario (0.26) (Fig. 5).

Children are the next generation of Latvia, thus, they shall be provided with the best and most natural food - ecological dairy products. Such approach is most distinctively ensured by the public procurement scenario. Moreover, the authors consider that according to this scenario dairies will be more interested in establishing eco-lines in their enterprises but organic milk producers – in establishing cooperatives.

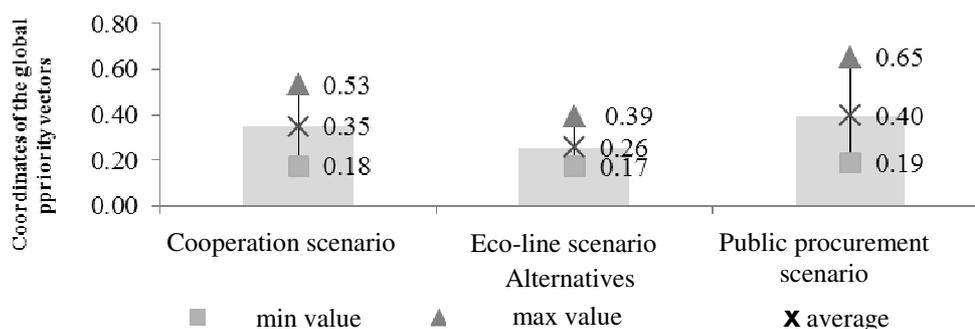


Fig. 5. Global priority vectors of the alternatives for the development of organic milk processing in Latvia

Owing to the national support policy change, organic milk processing volumes will increase; moreover, it will comply with the objective determined by the Latvian Sustainable Development Strategy 2030 – Latvia as a “green” country.

However, it is important to emphasise the existing dispersion between the average indicator (49 %), which could be explained by the fact that the implementation of this scenario would increase organic milk processing volumes gradually over a long term, while the implementation of the cooperation and eco line scenarios would increase dairy volumes more rapidly in a short-term period.

## Conclusions

1. During the analysed period, Latvia has been the leader among the Baltic States in the number of organic certified farms. Moreover, the proportion of organic land in Latvia constituted 11 % of the utilized agricultural area, which ranked Latvia in the fifth place in the EU by the proportion of organic land of the total land used in agriculture. Based on the obtained data, the authors concluded that Latvian organic dairy farms have the potential to increase production and successfully develop in the future.
2. Yet, despite sufficient land resources, the aggregated data show that organic milk did not exceed 8 % in the total amount of milk in the period of 2008-2013. In the authors' opinion, among other problems, the most serious drawback during the analysed period was that only 29.9 % of organically produced milk was sold as organic milk. Consequently, the lack of organic milk processing companies in Latgale region results in the sales of organically produced milk as

- conventional milk and reduction of organic farmers' income as organic milk is being sold as conventional for lower price.
3. The authors elaborated three scenarios for the development of organic milk processing in Latvia: the cooperation scenario – establishment of organic milk producers' cooperative society; the eco-line scenario – eco line creation at dairies of the JSC “Smiltenes piens” and the JSC “Preilu siers”; and the public procurement scenario – the general education institutions are 100 % supplied with organic milk and dairy products by 2025.
  4. After performing the hierarchy analysis method, the authors came to the conclusion that organic dairy development could be promoted and Latvian milk processing volumes could be most efficiently increased by implementing the public procurement scenario, which provides that Latvian general education institutions are 100 % supplied with organic dairy products by 2025.

### Proposals

1. It is necessary to ensure that the policy makers in the Republic of Latvia adopt provisions, which state that the general education institutions should be provided with 100 % organic dairy products by 2025 in order to promote organic dairy development, thus, ensuring Latvian children and young people with high quality, healthy and environmentally-friendly dairy products.
2. In order to obtain more objective and precise information on the situation in Latvian dairy industry, the Agricultural Data Centre, in preparing annual monitoring results on dairy farms, has to distinguish records on organic and conventional milk producers because, firstly, the volumes of organic milk production and processing increase every year, and secondly, because conventional dairy farms tend to have their production certified as organic.
3. It is recommended for the Ministry of Agriculture, in collaboration with the Agricultural Data Centre, the Rural Support Service and the Food and Veterinary Service, to create a publicly accessible database system providing data on organic farms in Latvia, including dairy farms, to encourage new research development, such as innovation and technology for organic agriculture in order to reduce the difference between organic and conventional production.
4. The Food and Veterinary Service, the state Ltd “Certifying and Testing Centre” and the certifying institution “Vides kvalitāte” in scope of their activities aimed at creation of organic farming database, should separate milk livestock, providing a detailed information on milk production and dairy cattle so that every citizen could precisely find out the products (and their producers) certified by these institutions.

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