
**CHARACTERISTICS OF SHEEP FARMING SECTOR AND ITS
DEVELOPMENT IN LATVIA**

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Abstract. The research aim was to study the development of sheep farming sector in Latvia and to appraise the current situation of the sheep farming sector in Latvia. The following methods were used - method of analysis, analysis of regulatory enactments, monographic or descriptive, graphical methods, content analysis, and statistical analysis - to analyse the research so that it would be possible to achieve the aims and to accomplish the tasks defined in the study. As a result, the research provides characteristics of the sheep farming sector and analysis of the historical development in Latvia, description of the figures of sheep industry in Latvian agriculture and assessment of the information and statistical data on production of the sheep farming sector on both domestic and foreign markets. This study has reflected laws and regulations governing the processes of sheep farming sector in Latvia. This study uses data of Agricultural Data Centre of Latvia and the Central Statistical Bureau on sheep farming from 2008 to 2013. It has been found that one of the main problems in the sector in Latvia is small total number of sheep. High fragmentation of the farms and insufficient total volume of production is the cause for import of products of the sheep industry. Positively that sheep farming is one of the fastest growing sectors of agriculture in Latvia, as indicated by the number of sheep on 1 July 2013 – 99412 sheep, or an increase of 22% compared with 1 July 2008, when 76877 sheep were registered in Latvia.

Key words: sheep farming in Latvia, agricultural development.

JEL code: Q1, Q15

Introduction

It is important to carry out research on the sheep farming sector which is one of the components of the concept of sustainable development as defined by the European Parliament, as on 19 June 2008 in its resolution about future of the sheep farming and goat farming sector in Europe, the European Parliament has recognised the role of sheep farming and goat farming sector in sustainable rural development, pointing to the significant contribution of these agricultural sectors and their importance in social, economic, and environmental area as well as noticed the need to take steps to ensure profitability and sustainability for EU sheep and goat meat and dairy sector also in the future, to promote consumption of such products as well as to retain and attract new entrepreneurs in this sector (Committee on Agriculture and Rural Development, 2008). While analysing scientific literature, scientists have emphasised the importance of sustainable development in the sheep farming sector in various theories. The basic idea of sustainable development calls to meet the needs for the current generation by balancing the interests of public welfare, the environment and economic development, while ensuring respect for the environment and the conservation of biological diversity, as not to undermine the ability for future generations to meet their needs, thus, it is necessary to strive to combine economic, ecological, and social objectives in agricultural development to ensure is sustainability. The development of sheep farming also has its role

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in reaching this goal. In addition to consumer products (such as meat, wool, leather, and milk), sheep farming offers public goods: assurance of environmental safety, natural resources, conserves the rural environment and local farming traditions (Latvian Sheep Breeders Association, 2013a). It should be noted that the sheep are considered an essential part of organic farms, because it is an effective way to use biological plant products, to ensure crop farming with integration of animal production, and to provide natural fertilisers for crops (Raducuta, 2012).

It is, thereby, important to continue the study in the sheep farming sector, and to develop strategy for sustainable breeding of animals, which requires setting up a lot of goals, breeding activities, keeping the adaptation abilities and promoting the biodiversity which also focuses on additional profitability (e.g. Olesen, 2000; Nielsen 2005, 2006). By the way, biological farming is an agricultural sector which has steadily increased in recent years around the world and, especially, in the European Union (Raducuta, 2011, Willer, Kilcher, 2011).

The sheep farming sector in agriculture of Latvia has been developing steadily since joining the European Union, and furthermore, it has experienced a steady growth in recent years (Figure 1). The sheep farming is very important also for the regions of Latvia, since the benefit of sheep is a thrifty use of natural resources and efficient way to manage resources in the production process. Sheep farming is one of the most relevant sectors in order to be able to engage successfully less favoured areas for agriculture and for production units with relatively little agricultural land (hereinafter - AL) area. In Latvia, sheep farming sector uses about 3.4 thousand hectares, i.e. agricultural land engaged in manufacture (Garkalne, 2013). Sheep farming in Latvia is on the path of development, as shown also by the characteristic values **of sheep farming, while in the author's view, more rapid development requires additional funding from the state**, as the current situation development perspectives of sheep farming are provided by cooperative societies and organisations of sheep breeders.

In the author's view, sheep farmers and other stakeholders must have specific long-term goals and strategies to further effectively use existing resources in Latvia and increase economic efficiency of farms as well as to attract potential resources available. The author believes that these issues need to be addressed and updated by all the parties involved and to promote communication between local governments and sheep farmers, promoting human awareness, and education in sheep farming questions. In Latvia, farmsteads with small, non-utilised area have remained, which could potentially be involved in the development of sheep farming, since the sector does not require significant financial investment. **The research hypothesis:** sheep farming industry is one of the most stable traditional agricultural sectors which tends to develop by an increase in the total number of sheep in Latvia. **The research aim** was to study the development of sheep farming sector in Latvia and to appraise the current situation of the sheep farming sector in Latvia.

The following tasks were set forth to achieve the research aim:

- 1) to describe sheep farming and its historical development in Latvia;
- 2) to study the production resourcing for sheep farming in Latvia;
- 3) to evaluate the performance of sheep farming sector in Latvia.

In the study, theoretical knowledge on the history and sector development of the sheep farming in Latvia was obtained by analysing both specific and general literature, national and foreign scientific articles and publications. The study used the EU, including Latvia's, legal enactments. Information of Latvian Sheep Breeders Association, the Central Statistical Bureau, the Rural Support Service, and the

State agency Agricultural Data Centre was used for business and economic analysis of sheep farming sector.

The following research methods were applied: analysis and monographic method – to find theoretical knowledge on the historical development of sheep farming sector in Latvia and to describe the present situation as well as to obtain the sheep farming sector development perspectives. Laws of the Republic of Latvia and the Cabinet Regulations governing sheep farming sector were analysed for document analysis. Statistical analysis is used to analyse the statistical data provided by the Agricultural Data Centre on performance indicators of the sheep farming sector from 2008 to 2013. Graphical method - the acquired information and statistical data on the sheep farming industry are summarised and shown in the figures to give a better understanding of the existing and future possible trends in the analysed period.

Research results and discussion

1. Description of sheep farming sector and historical development in Latvia

Latvia is suitable for the development of sheep farming, besides Latvia has a long sheep farming tradition, as historically Latvia, among other Nordic countries, has been the largest sheep farmer; thus, the knowledge on farming is significant in Latvia. In 1935, there were 1347000 sheep in Latvia, and the number was several times higher than the number of sheep per km² in Sweden (Latvian Sheep Breeders Association, 2013b). **Sheep breeders' previous experience has shown that the development of sheep farming sector is possible also in less-favoured areas for intensive farming.**

Sheep farming business in Latvia can be divided into two economic areas: 1) breed farms, and 2) farms engaged in the production of meat. Nowadays, sheep farming in Latvia is becoming a profitable employment, because the demand for lamb meat and breeding animals is growing rapidly in Europe, so it is important to adjust the sector for it to give the maximum benefit to farmers and the country's economic development. In total 4430 farms in Latvia were registered in the Agricultural Data Centre before 1 July 2013 with a total number of sheep – 99412, including 34547 registered ewes as well as there are 42 breed farms in Latvia engaged in the growing of materials of breed and their reproduction.

Historically, Latvian dark-head sheep breed is grown in Latvia. Latvian dark-head sheep breed was created by crossing local sheep with Oxfordshire and Shropshire rams, which were imported from Sweden and England. From 1927 to 1937, Latvia imported 257 Shropshire and 83 Oxfordshire breed rams; ram stations and sheep farms were created. In 1937, a total of 587 ram stations and 172 sheep farms were created. After 1937 import of Shropshire and Oxfordshire breeds was stopped, since it was believed that enough breeding material had been grown to be able to make a successful breeding work of Latvian dark-head breed. At a later time, a number of popular European sheep breeds were used for breed improvement: in the 1970s to increase fertility - Finnish Landrace, in the 1980s for fast-growth and to improve the quality of meat – meat breeds of sheep - Il-de-France and Texel, at the end of the 1990s - the German blackheads and Il -de -France.

Latvian dark-head sheep breed is characterised by a strong constitution, a strong bone structure, wide and long body. The sheep are healthy, have adapted to relatively humid Latvian climate, ewes live weight is 55-65kg, rams - 100 to 120kg. Sheep fertility is 150-160%.

Experts believe that a positive characteristics of Latvian dark-head sheep breed need to be maintained and further develop properties like animal constitutional strength and adaptation to local

conditions, the ability of sheep reproduction (fertility and lamb viability) as well as good fast-growth of sheep (a properly raised new sheep can be used for breeding of 9 - 10 months of age), and merchantable quality of the meat. It appears that the implementation of preservation programme of the Latvian dark-head sheep has been successful in recent years, and in addition an increased interest in Latvia is observed in the use of pure-bred rams for natural sheep mating, thus, arriving at genetically homogeneous herds, which is an important prerequisite for further production of lambs. Latvia's breeders shall do research on ewe genealogy (Latvian dark-head sheep).

2. Production resourcing for sheep farming in Latvia

While analysing resources of the production of sheep-farming, the study describes production resources such as land, labour and knowledge, technical support, financial resources and the flow of information and availability. The study describes the above mentioned resources which are related with production resourcing of sheep farming sector (Latvian Sheep Breeders Association, 2013b). According to the data provided by the association "Latvian Sheep Breeders Association" (hereinafter - LAAA), Latvia's institutions have registered and issued certificates to total 43 breed farms of which 30 farms are in Vidzeme region. The situation is due to several factors: 1) LAAA office and ram control growth and control fattening station "Klimpas" is located in Vidzeme region, and there is an active communication and exchange of information between breeders and the association, 2) Vidzeme region has less favoured areas where manufacturing of other agricultural products is less likely or limited, thus, the farms choose to engage in biological farming, including sheep farming. However, sheep are registered, in all regions of Latvia suggesting that climatic conditions throughout the territory of Latvia are suitable for raising sheep. Most sheep are registered in the regions of the Northern Kurzeme as well as in Vidzeme and Latgale regions.

Meadows and pastures are most important ways for the use of AL, which as a resource for forage is needed for the development of sheep farming sector. The provision of need of forage has a decisive role in the process of sheep farming, which is largely provided by usage of meadows and pastures. In sheep feed ration, the largest proportion consists of forage. Concentrated feed, grains and feed additives (minerals, microelements, vitamins) are needed in addition. In grazing period, sheep mainly use pasture grass (Warren). Sheep need a good quality, protein-rich animal feed, so farms need to create high-quality grasslands with a sufficient percentage of legumes; lands require for soil conditioning (removal of stones and bushes, fertilisation, liming) (Latvian Sheep Breeders Association, 2013a). In Latvia, sheep farming sector includes a large proportion of farms which cannot provide grassland of adequate quality because of the lack of finance (Latvian Sheep Breeders Association, 2013a). Despite this, a number of sheep farming workers have insufficient knowledge directly of sheep farming and also other related fields, which is necessary to acquire in order to choose an optimal management model, innovate production, and make a profit. New farms engage people with a good knowledge on business management, however, insufficient specific knowledge on animal husbandry, agronomy, and biological farming.

Unlike many other agricultural sectors, sheep farming does not need such a big investment in technical facilities and structures; however, mechanisms, machines, buildings, and equipment are necessary: pasture fencing, light type, unheated barn where the animals can survive the winter, equipment for watering, dispensing the concentrated feed, silage harvesting equipment and storage as well as equipment significantly reducing the need for manual handling - mechanical scales replaced with

electronic, PC compatible scales, special sheep catching devices, electronic ear tag readers and other equipment. Co-financing from the EU Structural Funds is available for purchase of technological equipment, for individual farms as well as for collaborative projects (Latvian Sheep Breeders Association, 2013a). Financial resources are necessary for starting-up as well as for development of sheep farming for investment in technological equipment and purchase of working capital (purchase of animals, purchase of feed etc.). Information on the key areas for development of the industry is provided by the state institutions, non-governmental organisations (LAAA), scientific community, educators and consultants (LLKC) as well as local governments.

3. Latvian sheep farming sector development indicators in Latvia

When evaluating the sheep farming sector development indicators in agriculture of Latvia, the study assessed the information on the sheep farming sector production on both domestic and foreign markets. Overall, in Latvia the sheep industry is experiencing a positive trend in recent years, the number of farms in sheep farming and the total registered number of sheep in them is increasing. Increase in the number of sheep is positively impacted by the increasing demand for sheep meat on both local and foreign markets as well as live sheep exports to Germany, Belgium, Denmark, and Bulgaria. As the result of focused breeding it has been possible to increase the fertility of ewes, preservation and fast-growth of lambs, so the further work in the field of sheep breeding is needed (Latvian Agriculture 2012, 2013). Goal of sheep breeding is to create a stable sector of sheep breeding and processing. In recent years, both the total number of sheep and herds has significantly increased in Latvia. By the data of the Agricultural Data Centre (Table 1) 99412 sheep are registered on 1 July 2013 in Latvia, which is about 22535 sheep more than on 1 July 2008, or it has been about 22% increase in the number of sheep.

Table 1

The dynamics of the number of sheep, ewes and rams in Latvia in the period from 1 July 2008 to 1 July 2013

Year	Sheep			Ewes			Rams		
	number	$\Delta m(k)^*$	$t_{m(k)}^{**}$ %	number	$\Delta m(k)$	$t_{m(k)}$, %	number	$\Delta m(k)$	$t_{m(k)}$, %
01.07.2008	76877	-	-	27223	-	-	48	-	-
01.07.2009	81134	4257	5.54	28758	1535	5.64	104	56	116.67
01.07.2010	87885	6751	8.32	31052	2294	7.98	147	43	41.35
01.07.2011	93532	5647	6.43	32988	1936	6.23	170	23	15.65
01.07.2012	98580	5048	5.40	34253	1265	3.83	207	37	21.76
01.07.2013	99412	832	0.84	34547	294	0.86	240	33	15.94

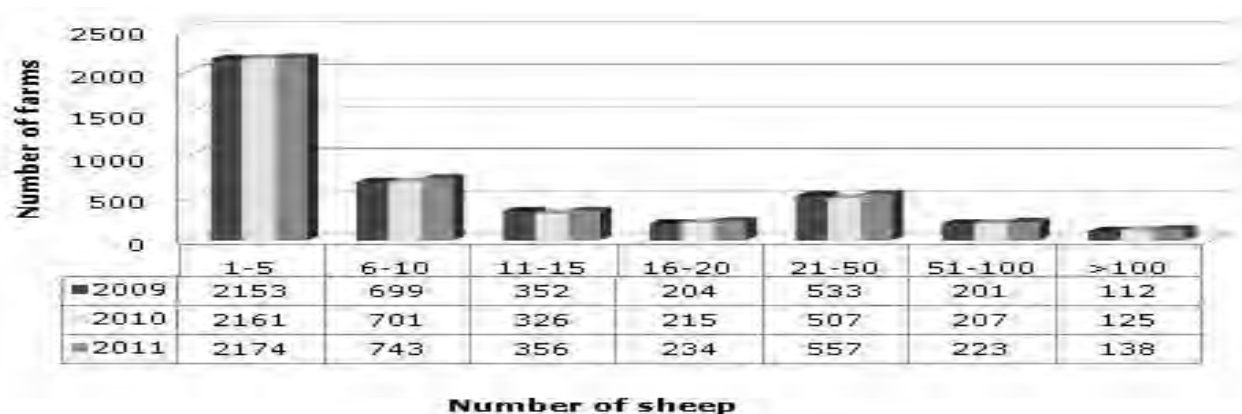
Source: author's construction based on data of the Agricultural Data Centre, 2013

* **Chain absolute increase** $\Delta_{m(k)}$ is obtained by subtracting the previous level y_{m-1} from the current level of row y_m . $\Delta_{m(k)} = y_m - y_{m-1}$ ****Chain and base increase rates** $t_{m(k)}$ are obtained from the current chain growth rates subtracting 1 (i.e. 100%). Increase rates, like growth rates, are expressed as fractions or percentages $t_{m(k)} = \frac{\Delta_{m(k)}}{y_{m-1}} \cdot 100$ (Krastins, 1998).

While analysing (Table 1) the development of sheep farming sector during the past years, it can be concluded that this sector is stable in recent years, as demonstrated by the statistics i.e. on 1 July 2008 there were registered 76877 sheep in Latvia, while on 1 July 2013, the number has risen to 99412 sheep.

There are several factors for the rapid development growth of sector capacity and production volume is promoted by natural conditions of Latvia that are suitable for sheep farming, improvement of livestock genetic quality, as a key factor is the accession of Latvia to the European Union, which, thus, contributed to the increase in demand for sheep meat. While analysing the change of the number of ewes and rams, the total number of ewes and rams in Latvia has also increased including the growth in the number of sheep. In recent years, both the total number of ewes and rams in Latvia has significantly increased. By the data of Agricultural Data Centre (Table 1) on 1 July 2013 there were registered 34547 ewes in Latvia, which is by 7324 more than on 1 July 2008 or there has been around a 26.9% increase in the number of ewes. When accordingly analysing changes in the number of rams, then the number of rams in Latvia on 1 July 2013 has increased four times compared with 1 July 2008, or by 192 rams.

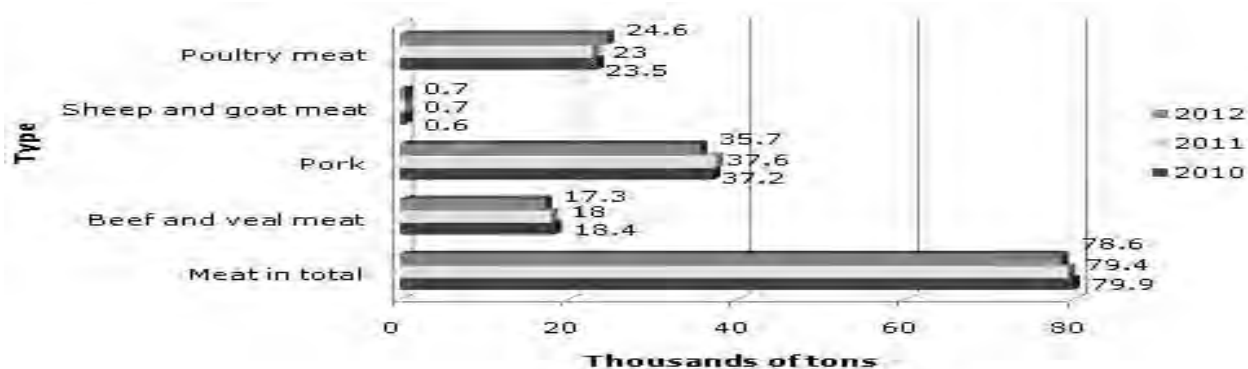
The sheep farming sector farms for the period of 2009–2011 were analysed in the analytical part of the study. To perform a calculation-based analysis, the study author (Figure 1) showed a distribution of farms by the number of sheep in the period of 2009-2011.



Source: author's construction based on the data of Agricultural Data Centre, 2012, 2013

Fig.1. **Distribution of farms in Latvia by number of sheep in the period of 2009–2011**

The situation in Latvia shows that 48% of farms have 1-5 sheep, which means that farms have small number of animals. While analysing the structure of sheep farms (Figure 1), it can be concluded that there has been an increase in the number of large farms in recent years. The largest increase in the number of farms, by 10.4%, was observed in farms with 100 or more sheep, while the number of farms with 51 to 100 sheep increased by 7.7%. At the same time, the number of small farms retains trend of previous years that small farms make up the largest proportion of the total number of farms. In 2011, 65% of total number of farms is registered as farms with 1 to 10 ewes, which mean that farms with a small number of sheep are not farms of meat production but sheep are farmed more for self-consumption as well as such farms have difficulties to provide the local market with a constant meat offer. Therefore, the exchange of information and co-operation among small farms to create more competitive farms with existing supply must be promoted. Complementing problem raised by previous studies in connection with the high fragmentation of the farms with a small number of sheep, causing insufficient meat production, the analysis was carried on the production of sheep farming sector in Latvia in the period from 2010 to 2012. The author of the study created Figure 2, which shows meat production volumes in Latvia.



Source: author's construction based on the data of Central Statistical Bureau, 2013

Fig.2. Volume of meat production in Latvia by type (carcass weight, thousand of tonnes) 2010-2012

It is possible to come to a conclusion that sheep farming is one of the most stable sectors of all traditional agricultural sectors, because meat production volumes are not decreasing; besides that Table 1 and Figure 1 show that the number of sheep and the number of farms in Latvia have increased during the past few years. The analysis (Figure 2) shows that meat production volumes in Latvia have decreased. The increase due to the growth of capacity of sector and production volume has been promoted by natural conditions of Latvia, also by demand of sheep in market. Improvement of livestock genetic quality is also taking place. Therefore, here, in the author's opinion, is one of the problems for the development of sheep farming, as there is a small total number of sheep and a small total average production volume on farm. The fact that the mutton demand in Latvia exceeds local farm output supply can be seen in Table 2, which shows mutton foreign trade in Latvia in 2012. Basically, sheep farming sector is characterised by three main product lines: meat, wool, and milk production. In Latvia, meat production is a major direction, while other sheep farming products are also used.

Table 2

Foreign trade of mutton in Latvia in 2012

Production type	Export			Import		
	EUR	kg	EUR/kg	EUR	kg	EUR/kg
Live sheep (number of pieces)	641			1689		
Fresh or chilled lamb carcasses and half	864	66	13.09	240	15	16.00
Fresh or chilled lamb carcasses and half (except lamb)	26 089	16 389	1.59	32 042	2 568	12.48
Fresh or chilled sheep meat with bone in (excl. carcasses, half-carcasses)	1 339	129	10.38	1791	220	8.14
Fresh or chilled boneless sheep meat	365	31	11.77	6958	2 084	3.34
Frozen sheep carcasses and half-carcasses (except lamb)	1 603	325	4.93	4118	843	4.88
Frozen sheep meat with bone (except carcasses and half-carcasses)	82 868	8 674	9.55	222 933	34 935	6.38
Frozen boneless sheep meat	41515	6355	6.53	181199	41 337	4.38
Total	154 643	31 969	x	449 281	82 002	x

Source: author's construction based on Latvian Sheep Breeders Association, 2013a, 2013

A very big problem in sheep farming sector is that farmers cannot produce enough to be sufficient for local consumption, and while farmers will not be able to produce for local consumption, they cannot expect a growth in exports. Table 2 shows the current situation of trends of sheep meat on the external market. The analysis of mutton foreign trade results in 2012 shows that the value of imported product

per unit of weight (Euro/kg) in some product groups is significantly higher than in the same group of products exported. It can be seen that in both the import and export the most valuable products (price per unit of weight) were fresh or chilled lamb carcasses and half-carcasses. Of quantities of fresh or chilled lamb carcasses export, one can conclude that the Latvian sheep breeders' farms exported 51.26% of total export quantity.

Conclusions, proposals and recommendations

1. The sheep farming sector in agriculture has been stable during the past few years, the number of sheep farms and the total registered number of sheep in them have increased, there were 76877 sheep registered in Latvia on 1 July 2008, while by 1 July 2013 the number increased to 99412 sheep, int. al., 34547 registered ewes. There are 42 breeding farms in Latvia that practice cultivation of breed material and reproduction.

2. The development factors involve the development of technologies, an increase of sector capacity, and growth of production volume, supported by the natural conditions of Latvia that are suitable for sheep farming as well as improvement of livestock genetic quality and the increase in demand for sheep meat.

3. The sheep farming is one of the most stable sectors of all traditional agricultural sectors in the regions of Latvia; its advantages are the economic use of natural resources and the rational method of resource management during the process of production.

4. In 2011, 65% of total number of farms were farms with 1 to 10 sheep in sheep breeding sector, which means that farms with the small number of sheep are not the ones that produce meat but the sheep are bred for their own use; for the farms like these it is also difficult to provide local market with a regular meat supply; however, it is positive that the number of the farms with 100 and more sheep increased by 10.4% in 2011, which stimulates the growth of competitiveness.

5. In 2012 Latvian sheep breeder farms mainly exported fresh or frappe lamb carcasses, that constitutes 51.26% of total amount of export, and frozen sheep meat with bones constituting 8 674 kg or 27.13%.

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