

OPPORTUNITIES OF LAND USE IMPROVEMENT IN DAIRYING OF LATVIAN REGIONS

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In Latvian economy, the dairying is one of the main production areas of the agriculture. It is evidenced by a comparatively high proportion of the dairies in rural entrepreneurship environment and by continuation of ancient traditions of milk production in rural regions.

The milk produced by larger or smaller dairying farms and sold to consumers or to the processors is for a lot of households the main source of income in the rural areas. Dairies had succeeded to be able to adapt elastically enough to the continuously changing entrepreneurship environment in rural areas and to social economic crashes under impact of the global financial crisis.

The production of dairying maintains still its dominant position among other livestock products in the country and provides more than 20 per cent of the added value in agriculture.

Similarly to other kinds of agricultural production, the developments in dairying depend, directly or indirectly, on land resources and their use. The study of the use of land by dairying farms gave evidence that a considerable instability there may be ascertained. It is characterised by the tendency of changes in the intensity of milk production in relation to the use of agricultural land that, in Latvian regions, differs significantly, making eventually a negative impact on a long-term development of milk cattle-breeding in the regions. It, in its turn, may result in unfavourable consequences for life quality improvement in rural areas, impeding the employment problems of economically active rural inhabitants.

The aim of the paper is to find ways for decreasing of differences in the intensity of the use of land by dairying farms, taking a closer look at the use of land resources by them in Latvian regions.

The paper will contain analysis of the present situation in land use by dairying farms, the evaluation of possible improvements in the use of land resources by the acting and future dairying farmers, as well as recommendations for complex solutions of urgent problems.

The research was based on monographic method, synthesis and analysis, logical – constructive method and analysis of statistical data, expert method and inquiry.

Keywords: *Dairying, rural regions, agriculture, land resources.*

Introduction

To accelerate the approach to the middle social economic level of the EU it is necessary to seek persistently for possibilities how to facilitate an increasing economic growth, diminishing of regional differences and a wholesome use of production resources in all economic areas. An essential role there may be played by agriculture, being the basis of living, employment and welfare of rural inhabitants. The development of agriculture, in its turn, is based on successful developments in its subareas provided that every one of them takes part in this process. The more important is the place of a subarea among the others, the higher its responsibility in relation to the use of the main resource – the land in the best and most efficient way, providing and increasing the fertility of the land as one of the most important factors of economic

development in rural entrepreneurial environment of every agricultural subarea, including also the dairying.

In Latvia, the dairying is one of the main agricultural areas and one of the forms of social economic activities related closely to maintaining and developing of traditions of such economic activities that are most desirable for rural environment. It is a production area that had never lost its importance in the economy of our country.

In environment of rural entrepreneurship of Latvia, the proportion of dairying is a considerable one: it provides employment for a great part of rural economic active inhabitants and is conspicuous for ancient traditions in rural regions. The amount of milk provided by bigger and smaller units of economic activity and realised in the market or

supplied for processors is the main and more stable income source of many households in rural areas that underlines the social meaning of dairying. The dairying in Latvia is able to adapt to changing rural entrepreneurial environment and social crashes on state level under the impact of global financial crisis.

Because of comparatively low technical-economic barriers in rural entrepreneurial environment, the production in dairying maintains its dominant position among other kinds of livestock products. In Latvia, the proportion of milk production makes more than 20 per cent of the amount of added value in agriculture. In 2011, the value of milk provided to processors made 22 percent that is the higher indicator in food production area. For many farms, the milk is the most important product that provides the major part of their income. (Latvijas statistikas gadagrāmata, 2011)

The milk production of dairy farms provides with employment more than 4 thousands of economic active inhabitants in the cities of our country. The value of exported products by milk processors exceeds 50 million LVL, and the diversification measures have succeeded in decreasing of the amount of imported dairying products by 14 million LVL. Besides, during the last years, there has taken place the export of unprocessed milk, the value of which exceeds, during the last 3 years, 40 million LVL. Therefore, directly or indirectly, the dairying facilitates the increase of gross domestic product and the improvement of the balance of payments of the country, as well as stimulates the employment of economic active inhabitants in the larger or smaller cities.

Like other agricultural areas, the decisive role in dairying is played by accessibility and use of agricultural land. The studying of the use of land by dairy farms in Latvian rural regions led to a conclusion that in milk production there exist real unused opportunities related to improvement of the use of land that is evidenced by unused still land areas, as well as by differences and instability, taking place in their use.

The **aim** of the paper is to ascertain opportunities favourable to decrease of intensity differences in land use by dairy farming in Latvian regions.

The **tasks** of the paper are:

- to describe the use of land in dairying;
- to analyse the intensity of milk production and the changes in it;

- to prepare some recommendations related to a more intensive use of land in dairying.

The research was based on monographic method, synthesis and analysis, logical – constructive method and analysis of statistical data, expert method and inquiry.

Some specifics in use of agricultural land in Latvian regions

The agricultural land has to provide the herd of dairy cows with sufficient fodder stock, taking into consideration that the development of milk production is related inseparably to the increase of fodder supply, and that it, in its turn, has a respective impact on the use of land in a most appropriate way. (Boruks, et.al., 2001)

In Latvia, the agricultural land and its use is subjected to certain changes in relation to the area and the kind of use. The highest increase of agricultural land area of rural farms – 10.6 per cent has taken place in Latgale region. It is followed by Vidzeme region with an increase of 4.5 per cent, but in Zemgale this indicator has increased by 2.8 per cent only. In its turn, in Pierīga region the agricultural land area has a decrease by 3.1 per cent. A similar tendency takes place in Kurzeme region, with decrease of this indicator by 1.8 per cent.

During the analysed period, from 2004 to 2012, the use of agricultural land has been subjected to considerable changes (Table 1). The highest increase of used agricultural land area has taken place in Vidzeme region, increasing from 289.6 thousand ha to 386.2 thousand ha. As a result, the total increase makes nearly 100 thousand ha or 33.4 per cent. A significant increase of the used agricultural land area – 23.6 per cent may be seen in Kurzeme region, as well as in Latgale region 21.1 per cent.

The level of increasing of the used area of agricultural land is lower in Zemgale region – 15.6 per cent and to Pierīga region – 17.4 per cent. In Pierīga region, the modest increasing of the used land is related to the use of land by different economic subjects, the land owners, in a better and more effective way outside the agricultural production system. The comparatively high level of the use of agricultural land in Zemgale region is related to a rather high level of natural fertility, providing many rural farms with an acceptable income level, if these land areas are used in accordance with

Table 1 . Changes of used agricultural land area in rural regions

Regions	Regional changes of used agricultural land area per annum (thousand ha)						Changes - %	
	2004.	2005.	2007.	2009.	2011.	2012.*	12./04.	07./04.
Pierīga	196.3	223.2	233.5	217.5	226.9	230.5	17.4	19.0
Vidzeme	289.6	336.8	363.5	336.2	381.4	386.2	33.4	25.5
Kurzeme	282.3	324.8	336.8	316.1	348.6	349	23.6	19.3
Zemgale	346.0	371.0	382.9	375.5	391.1	400	15.6	10.7
Latgale	380.6	449.5	459.1	416.0	448.3	460.8	21.1	20.6
Total	1 494.8	1 705.3	1 775.8	1 661.2	1 796.3	1 826.5	22.2	18.8

Source: calculation results on the basis of the data of CSB of Republic of Latvia*Prognosticated data

the planned aim and by a possibly high level of intensity. (Blakely, 1994)

Intensity changes in the use of agricultural land in dairying

The owners and users of the land are interested in managing of their farms in a way that provides a possibly high income and low production costs. But it, in its turn, requires that the land should be used effectively. The more effective will be the use of the land the higher will be the income. It means that it is necessary to get a possibly great amount of milk per unit of the land at possibly low production costs. (Dambīte, Vilciņa, 2005) The calculation results related to milk production intensity changes regarding the use of agricultural land are included in the Table 2. In the end of the analysed period, the highest intensity in milk production took place in Pierīga region – 658 kg/ha and in Vidzeme region – 528 kg/ha, falling behind Pierīga region by 24 per cent. In its turn, the lowest intensity level – 353 kg/ha takes place in Latgale region. The difference between the highest and the lowest intensity level in milk production, concerning the use of agricultural land, made in 2012 1.86 times that indicates to a multidimensionality of intensification in dairying. This difference cannot be explained only by different fertility of land and by a lower milk yield of dairy cows or by inadequate intensification measures in increasing of the fertility of land or the milk yield of cows. The essence of the problem must be sought in the system of the PESTE as a whole and in the ability of dairying subjects to adapt to the continuously changing environment of entrepreneurship, determining the total of production costs and of the income in dairying.

With the aim to get a more detailed concept regarding intensity changes in milk production in relation to the use of agricultural land area, the respective time series were changed into graphical models, with determination of the tendency of the nature of changes in the time series. The character and the tendency of intensity changes in milk production in Pierīga, Latgale and Zemgale region are included in the Figure 1. The included in it graphical models, reflecting the character and tendency of intensity changes in milk production in relation to the use of agricultural land evidences once more the expressively instable milk production character that may create serious threat to development of dairying in Latvian regions with all unfavourable consequences to the improvement of

the life standard and to the competitiveness of rural life area with the life standard in cities. (Rivža, et.al.,2005).

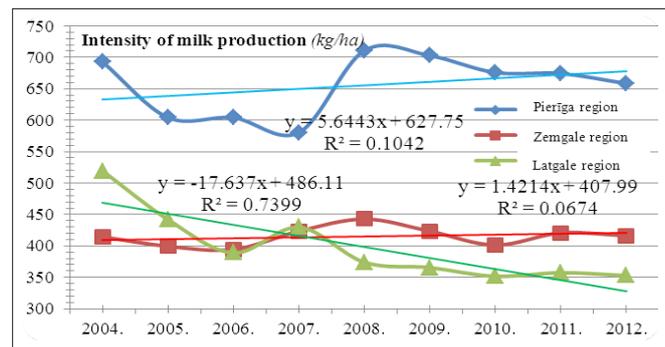


Figure 1. Dynamics and tendencies of changes in milk production intensity in Latgale, Pierīga and Zemgale regions in relation to the use of agricultural land area (Elaborated on the basis of the data of the CSB of Republic of Latvia)

In Zemgale region, the wavy form of changing character in milk production intensity and the low value of regression coefficient indicate, with certainty, to instability of the process, being studied. However, in this case, the instability is not yet destroying, because the indicator describing the intensity changes in milk production changes in a comparatively narrow amplitude, exceeding not 60 kg/ha.

The nature of intensity changes in Pierīga region differs essentially from that in Zemgale region that is also indicated by the linear trend function. It is interesting that, during the rapid growth period, the milk production intensity decreases from 693 kg/ha to 580 kg/ha, but, with the recession, setting in, in 2008, it grows up to 711 kg/ha or by 33.4 per cent, and, during the following intervals decreases gradually. Nevertheless, the trend function indicates to the lasting of a positive growth tendency.

In Latgale region, the intensity level declines rapidly that is created, for the most part, by a decreasing of milk production intensity during the period from 2004 to 2006 and in 2008. It means that, in Latgale region, there may be a great number of dairies with increasing unused agricultural land areas or decreasing land fertility, if it is not used in production of other plant growing produce outside the fodder necessary for dairy cows. If such decreasing of milk production intensity related

Table 2. Changes in milk production intensity per unit of agricultural land area in regions

Regions	Annual milk production changes per ha in regions									12./04.
	2004.	2005.	2006.	2007.	2008.	2009.	2010.	2011.	2012.	
Pierīga	693	604	604	580	711	703	676	674	658	-5.0
Vidzeme	587	529	518	556	587	590	531	530	528	-9.9
Kurzeme	494	463	464	429	512	536	470	475	483	-2.0
Zemgale	414	399	394	423	443	423	401	421	416	0.4
Latgale	519	442	389	430	374	365	352	357	353	-32.1
Total	526	475	459	474	503	501	465	471	467	-11.2

Source: calculated on the basis of the data of the CSB of Republic of Latvia

to the use of agricultural land and followed by decrease in mineral fertilizers and pesticides may be favourable to the environment, then it is unfavourable to the household income of rural inhabitants and worsens the economic and social dimension of entrepreneurial environment considerably.

The nature and tendencies of intensity changes in milk production of Kurzeme and Vidzeme regions, as well as in the rural regions in total are characterized by graphical models in the Figure 2. The models show a comparatively similarity of the nature of the changes that evidences the dominating impact of the factors, determining changes in milk production, in several rural regions. Similarly to the Latgale region, also in Vidzeme region the intensity changes in milk production have a negative tendency in relation to the use of agricultural land.

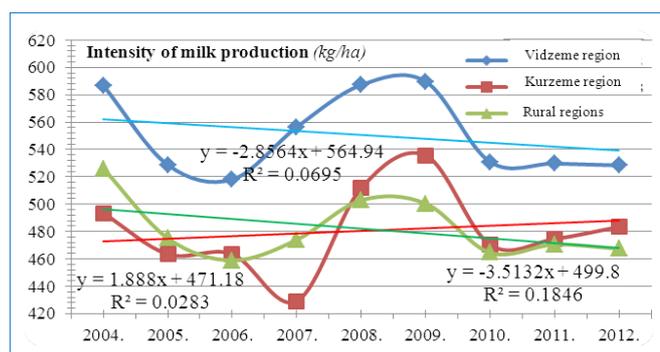


Figure 2. Dynamics and tendencies of changes in milk production intensity in Kurzeme and Vidzeme regions in relation to the use of agricultural land (Elaborated on the basis of the data of the CSB of Republic of Latvia)

Like Pierīga region, the milk production intensity related to the use of agricultural land in Vidzeme and Kurzeme regions changes contrary to the nature of economic growth. During the period of a rapid economic growth in the country on the whole, the milk production intensity in these regions decreases, but it starts to increase with beginning of the recession in the economy, in 2008. This intensity increase continues to the 2009, when the economic recession reaches the lowest point. With recommencing of economic growth in the country in the second half of the 2010, the intensity in milk production decreases again. If during the following time periods in Kurzeme region, the milk production intensity increases, then in Vidzeme region it decreases, in spite of a comparatively rapid economic growth in the country.

Intensification measures in land use are related closely to the intensity increase of dairy cows. If intensification measures related to the increase of land fertility provide a possibility to increase the amount of fodder produced per the unit of the area and to improve, in such way, the feeding of dairy cows in the quantitative and qualitative aspect, then the intensification measures in the area of milk yield increase provide a growth in the produced milk amount, facilitating in such way the improvement of intensity indicators of disposable agricultural land. (Latvijas lauksaimniecība un lauki, 2005)

Concerning the dairies of Latvian rural regions, there is urgent the problem related to milk yield increase of dairy cows to stimulate the disposable income of dairies. Data related to the intensity of the use of dairy cows or to milk yield per cow give evidence that, in this respect, there are

taking place positive changes in all rural regions. The highest increase in milk yield can be seen in Zemgale region, in which the intensity of the use of dairy cows has increased from 4112 kg to 5528 kg or by 34.4 per cent, during the period 2004–2012. However, the highest milk yield per cow – 5949 kg was got, in the end of the analysed period, by the dairies of Pierīga region. In this region, the milk yield of dairy cows increased by 26.8%, and it is the second best indicator in the regions. The lowest intensity level of the use of dairy cows can be observed in Latgale region, in which the milk yield average per dairy cow in the end of the analysed period made 4138 kg, and, as a consequence, the milk yield of Latgale region dairies dropped by 862 kg behind the average intensity indicator of the use of cows in the country.

The most rapid relative intensity increase of the use of cows, during the rapid growth period of economy, has been ascertained in Kurzeme region, in which the average milk yield per cow increased by 19.1 per cent. The intensity of the use of dairy cows increased in some regions also during the recession. In the first year of recession, the highest relative increase of milk yield per cow – nearly 19.4 per cent took place in Pierīga region. In its turn, the highest increase of a negative nature could be seen in Latgale region, where the milk yield per cow decreased in 2008 by 8 per cent per cow, and in Pierīga region, where the decrease in 2006 had decreased by 3.2 per cent.

It may interesting to mention that, in rural regions, the average relative increase of intensity in use of dairy cows maintains a positive growing pace during all time intervals included in the analysis. The highest values are achieved in 2007 – 4.4 per cent and in 2008 – 5.1 per cent. The lowest increase rate of milk yield took place in 2012. It, possibly, may be related to the approach of a great number of dairies to the top level of the quote.

A more stable intensity increase nature in the use of dairy cows may be seen in the dairies of Vidzeme region, where the impact of rapid economic growth in the country and of the following recession may not be seen. That is why this region has the lowest fluctuation amplitude, exceeding not 7.21 per cent. Considerable instability features in the nature of intensity changes in the use of dairy cows appeared in Pierīga region. In the favourable to economic development year – the 2006, this region was characterized by decreasing of milk yield per cow, although, in Vidzeme and Zemgale regions, the milk yield per cow increases during this period.

In Pierīga region, the intensity of the use of dairy cows increases rapidly in 2008 – by 1000 kg, achieving 5870 kg per cow, but in the following time intervals the increase ceases gradually, and in the end of the period becomes negative.

In Zemgale region, the inner and outer factors, influencing the activity of dairies, had not created so radical changes in the milk yield of dairy cows as it may be seen in the dairies of Pierīga region. The comparatively high intensity level in the use of the herd of dairy cows in Pierīga, Zemgale and Vidzeme regions indicates clearly to the necessity of a new, innovative approach related to elaboration and use of intensification measures facilitating and adapting intensification measures for further increase in milk yield with the aim to diminish the difference in comparison with the countries of the ES-15. In Latgale region, the nature of intensity increase in the use of the herd of dairy cows is expressively more instable

in comparison with the respective processes in other rural regions.

In the dairies, functioning in Latvian regions, there have taken place essential changes in the quantitative indicators of the herd of dairy cows in the direction of diminishing. If in the beginning of the analysed period the number of the used cows made 186.2 thousand, then in the end of the period it made only 164.2 thousand or had decreased by 11.9 per cent. The highest decrease has taken place in Latgale region – by 11 thousand or 23 per cent. It may be possible that the sharp decrease in the number of cows in Latgale region is related to comparatively low income level of dairies and the movement of economic active inhabitants from the rural areas to the cities or emigration. However, despite these unfavourable changes, the dairies of Latgale region have the highest number of dairy cows among the other rural regions.

In Vidzeme and Kurzeme regions, the relative decrease in the number of dairy cows is less several times – respectively by 2.9 per cent and 3.7 per cent. It indicates to a comparative stability of objective and subjective factors, influencing the intensity and extensity of milk production in these regions, the maintaining of which is facilitated a great deal by the agricultural policy, implemented in the country.

A clearer concept about changes in the number of dairy cows, in the qualitative aspect, may be obtained following the intensity changes of the respective indicator in every interval, included into the analysed period. More rapid relative changes in the number of dairy cows in rural regions are ascertained in the 2007. In this year, the highest increase in the number of cows – 8.1 per cent was in Latgale region and in Vidzeme region – 5 per cent, but in Kurzeme region there took place the highest decrease – 15.9 per cent. As a result, in this year the vertical fluctuation amplitude of intensity changes related to this indicator reaches the highest maximal value – 24 per cent. The highest value of horizontal fluctuation amplitude of relative changes in the number of dairy cows is ascertained in Kurzeme and Latgale regions, in which the difference of changes reaches the maximal and minimal value of intensity, respectively, 23 per cent and 22.5 per cent. The rapid decrease of the number of domestic animals create losses not only to the respective dairy, but also to the society as a whole that loses potential opportunities to maintain the previous milk production level and together with it also the potential working places and income. Therefore, the state intervention

measures should not create sharp changes in the quantitative and qualitative structure in the herd of dairy farms. (The development and Future of the Common Agricultural Policy, 1991)

Of essentially negative nature changes can be observed in the number of dairy cows per unit of agricultural land area. The highest decrease is typical to the dairies of Latgale region. If in the beginning of the analysed period there were 13.3 cows per 100 ha agricultural land, then in the end – only 8.6 cows or 1.4 times less. In other regions the decrease of the value of this indicator exceeds 20 per cent. Sharper changes can be seen in Vidzeme region – 27.3 per cent and in Zemgale region – 25.5 per cent, but less changes relate to the Kurzeme region, in which the number of dairy cows per unit of agricultural land area has decreased by 22 per cent.

The agricultural land is an active co-partner in creation of income in dairying. Besides, the land is one of most expensive resources in dairying, and the money used for its acquiring repays, in most cases, in a middle term or long term period. Therefore, the owners of dairy farms are constantly interested in increasing of income in both the income in total and the income per unit of the land area or relative income that is an important indicator, determining the price of agricultural land and the amount of financial investment into the increase of land area in relation to enlargement of the activity of the dairy farm.

During the analysed period, the highest increasing of the income took place in Kurzeme region, as well as in Vidzeme and Zemgale regions, but the lowest – in dairies of the Latgale region. Differences in the increase of income in relation to the regions may be explained, to great extent, with natural and acquired advantages in every of the rural regions and with abilities and opportunities of functioning in them dairies to link these advantages with intensification activities in milk production.

The highest specific income, in relation to the land used in milk production are typical to Pierīga region (Table 3), having achieved, in the 2012, 142.4 LVL/ha, but the highest increase of specific income for the period 2004-2012 relates to the dairies of Zemgale and Kurzeme regions, making 66.3 per cent and 62.2 per cent, respectively. The changes in specific income of dairies indicate clearly to the growth of the tempo of social economic polarization of economic active inhabitants employed in the rural regions. If in the beginning of the period

Table 3. Changes in specific income of dairies per unit of used agricultural land area in regions

Regions	Annual changes in income per unit of the land (LVL/ha)									12./04. %
	2004.	2005.	2006.	2007.	2008.	2009.	2010.	2011.	2012.	
Pierīga	90.8	93.8	100.5	106.4	131.4	90.8	122.7	139.7	142.4	56.9
Vidzeme	76.9	82.1	87.6	102.0	108.2	76.2	100.4	109.7	114.7	49.1
Kurzeme	64.7	71.9	76.8	78.7	95.0	69.2	87.7	98.3	104.9	62.2
Zemgale	54.3	62.0	65.2	77.6	84.0	54.7	72.8	87.1	90.3	66.3
Latgale	68.1	68.6	64.0	78.8	68.2	47.2	64.9	74.0	76.6	12.5
In regions	68.9	73.7	76.2	86.9	93.2	64.7	85.8	97.5	101.4	47.0

Source: prepared on the basis of the data of the CSB of Republic of Latvia.

the difference of specific income in the dairies of Latgale and Pierīga regions made about 22 LVL/ha or 33.4 per cent, then in the end of the period the difference reaches 41 LVL/ha, having increased 1.9 times. It evidences, once more, the hypothesis that intensification measures in milk production are not in capacity to provide a competitive increase of income in all rural regions. The developed situation creates necessity to carry out essential reform in agricultural and regional development policy taking, to a greater extent, into consideration the factors of objective and subjective nature, affecting the competitiveness of life standard increasing on the local, state and EU level of the dairies, functioning in different rural regions.

The highest income increase of dairies in relation to the changes of the number of cows in the herd is typical to Zemgale region, in which the income per cow has increased from 539 LVL/cow to 1200 LVL/cow. During the whole period the highest income level remains constant in Pierīga region, reaching in 2012 about 1.3 LVL, but the lowest per cow – 898 LVL in Latgale region, dropping behind the Pierīga region by 1.4 times. In the dairies, the income per cow is directly proportional to the increase of milk yield per cow.

The Latvian dairies, having got into the united economic space of the European Union, have to compete with milk producers in other countries of the EU, possessing considerably richer traditions of milk production under conditions of market economy. The highest milk yield per cow is typical to Denmark, where the amount of produced and sold milk has increased per cow from 22.05 t in 2004 to 14.07 t in 2012. Also in relation to the intensity of the use of agricultural land, the Denmark is on the first place.

The changes in the specific income of the dairies in relation to the use of agricultural land indicate clearly to the increase of income polarization rate of economic active inhabitants employed in rural regions. The calculations evidence that the carried out intensification measures are not able to provide a competitive increase of income in all rural regions. The developed situation creates necessity to carry out an essential reform in agricultural and regional development policy, taking, to a greater extent, into consideration objective and subjective nature factors, affecting the competitiveness of life standard increasing on the local, state and EU level of the dairies, functioning in different rural regions.

During the analysed period, the production costs, in decreasing of which is interested every dairy, have increased

in all dairies, included into comparison, but, for the most part, it relates to Latgale region, in which they have doubled. The absolutely highest increase of production costs is ascertained in Pierīga region – 161 million LVL and in Kurzeme region – 157 million LVL, but the lowest – 0.69 LVL in Zemgale region.

A more precise view about the used resources may be obtained, relating the total of production costs to the agricultural land area. Most rapidly they had increased in the dairies of Latgale region – about 300 LVL or 1.8 times. A comparatively high increase takes place also in Vidzeme region – about 109 LVL or 43.4 per cent. Similarly, also the relative increase is typical to Pierīga region, but the absolute increase makes 117.2 LVL/ha. The specific costs of milk production, in relation to the changes in used land area, have a less increase in Zemgale region. In production costs, if related to a cow, there are sharp differences. The most rapid increase of specific costs in relation to the changes in the number of cows can be seen in Latgale un Pierīga regions, but the lowest in Zemgale region. It is typically that under conditions of rapid economic recession in 2009 the specific production costs in the dairies of rural regions have moved in opposite directions – in Pierīga, Kurzeme and Latgale they have decreased, but in Vidzeme and Zemgale – increased.

Relation of production costs to the amount of produced milk or the product cost indicator is the most important indicator of efficiency of intensification measures in milk production used in international comparisons that is used by many countries to determine the quantitative and qualitative aspect of state support to the dairies that are functioning under different economic conditions. In dairying, the total costs of used resources per unit of production has increased in all rural regions, but the highest increase – 9.2 santims per kg produced milk is ascertained in Latgale region and Pierīga region. A comparatively high increase of the product cost may be observed in Vidzeme region, but lowest is typical to the dairies of Zemgale region (Table 4).

Vertical fluctuations of the product cost indicators evidence that this indicator is influenced by the factors of local, regional and state level with changing intensity. Comparatively homogeneously the outer environment of dairies has changed in after-recession period, but the highest fluctuation amplitude relates to 2006 and 2008. This comparison once more indicates to essential differences of economical environment in rural regions that are ignored fully or partly in the framework of

Table 4. Changes in product costs in milk production of the dairies included in comparison

Regions	Annual product cost changes in milk production (Ls/SG)					Changes during the period	
	2006.	2007.	2008.	2009.	2010.	Absolute changes 10. - 06.	10./06. %
Pierīgas	11.5	14.2	10.0	14.4	17.6	6.11	53.12
Vidzemes	8.3	13.3	9.4	12.9	13.6	5.28	63.58
Kurzemes	11.3	16.8	11.3	12.9	13.8	2.49	22.07
Zemgales	13.5	13.4	10.2	11.7	15.0	1.47	10.87
Latgales	6,2	12.2	15.4	14.0	15.5	9.22	147.70
Average in Latvia	10.6	14,3	10.5	13.0	14.9	4.28	40.52
Vertical movements	7.3	4.6	6.0	2.7	4.0	7.76	136.83

Abbreviation used in the table: **SG** – dairy cow

Source: prepared on the basis of the data of the LURSOFT

support system of the state that is one of the most important causes of the social economic polarization in rural regions.

Long term investments related to achievement of farm owner's strategic aims in economic activities aimed to further increase of milk production amount, have increased in dairies of all regions, except the Latgale region. Relative indicators have increased more rapidly in Zemgale and Kurzeme regions. Also in after-recession period there has remained a considerable threat in relation to accessibility of long term investments and the desire to invest in enlargement of milk production and / or modernisation measures. (Priekulis, 2000)

In rural regions, the credits have increased by 32.6 per cent that is a comparatively high level. The credits per unit of agricultural land have increased more rapidly in Kurzeme and Zemgale region, but in Vidzeme and Pierīga regions the intensity of received credits is two times lower. The situation is bad in Latgale region dairies, where there takes place the financing of investment projects by borrowed money. The instability of economic activities and sharply changing threats to entrepreneurship in different rural regions is evidenced by identified vertical fluctuations that are changing with a growing intensity.

Research results for improvement of agricultural land use

The development of dairying in Latvian regions is determined a great deal by political, economic, social, technological and environmental factors on the basis of interaction of natural and obtained competition advantages with social economic and ecological factors dominating in respective province, region and state, as well as by the factors of international nature. Among these factors, there may be such, influencing equally intensification measures in milk production and development of dairies in all rural regions and the influence zone of which does not exceed the border of a region, province or dairy. To find out the impact of different factors, being important to all dairies and to the dairies of a concrete region there was organized by R.Zvirgzdiņa a discussion of expert group, inquiries of dairy managers and/or owners as well as potential dairy farmers. The results were different.

In accordance with expert viewpoints, the most important factors, affecting the development of activities in dairies, are provision of financial funds for carrying out of intensification measures and the adequacy of the knowledge of dairy farmers and the desire to improve this knowledge. (Ābeltiņa, 2009)

The milk producers have recognized as the most important factor, influencing the intensification, the financial provision for carrying out of measures of intensification related to the policy of milk purchase prices and inability to get profit, as well as the state support and its impact on results, being recognized by respondents as the second most important factor. For development of dairying and modernization an important factor is the knowledge of milk producers and desire to obtain them. As an important factor, there is recognized the accessibility of agricultural land. The accessibility of qualified labour force in carrying out of intensification measures is evaluated as unimportant that evidences that there are presently a great number of free labour force. (Dimza, 2003)

The potential dairy farmers relate to the most important factors in milk production intensification, modernization and

activity development of dairying the necessity of financial funds for beginning and further development, putting on the second place the cooperation in solution of economic problems, but on the third – the accessibility of qualified labour force.

Taking into consideration the differences in expert concepts and in results of inquiries in relation to factors, influencing the combination and interaction of production factors, these factors were combined and results reflected in Figure 3.

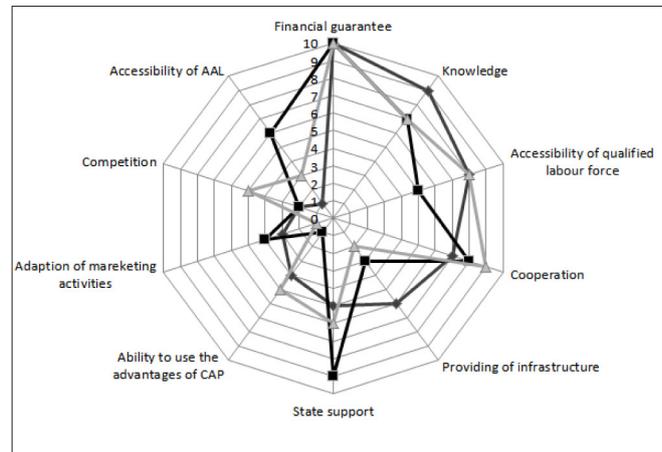


Figure 3. Comparison of factors influencing the intensification of dairies dependently on the stage of significance (Results of the surveys, carried out in the framework the research, and expert evaluations)

As it may be seen, the experts and the inquired have put on the first place, unmistakably, the financial providing. It is typically that the potential dairy farmers have recognized as important the cooperation in solution of economic problems. In its turn, the milk producers regard as important the state support and its impact on results, but the experts as comparatively unimportant. The accessibility of qualified labour force in carrying out of planned intensification measures and the adequacy to implementation of intensification is found out as significant by experts and future farmers, but less significant – by milk producers. The knowledge and desire to acquire them seem as most important to experts, but less important to future entrepreneurs and milk producers that may be explained with insufficient education and lack of cooperation. It is typically that, in comparison with experts and future entrepreneurs, milk producers recognize as important the obtaining of suitable agricultural land areas.

In the area of decision making on starting and continuing of milk production, as well as in implementation of intensification activities under conditions, when it is important to define the degree of significance that arises on the basis of combination of production factors, creating the development opportunities and threats in milk production, the method of hierarchy analysis may be used. The use of this method may be a contrast to well-known practice when decisions on enterprise level are made by the owner or manager on the basis of intuition and experience that is especially topical to small and middle enterprises (Saaty, 2008).

On the basis of hierarchy analysis, R.Zvirgzdiņa found out the factors affecting the intensification of dairies that may be used priority in facilitation of entrepreneurial activities and

intensification in milk production. In result of summarising the importance of the factors included in expert discussion and inquiries, R.Zvirgzdiņa chose and included in the hierarchy analysis matrix the factors recognized by respondents of inquiries and experts as the most essential in facilitation of entrepreneurial activities and intensification. The evaluation of results of expert discussion and both inquiries with hierarchy analysis method are reflected by the Figure 4

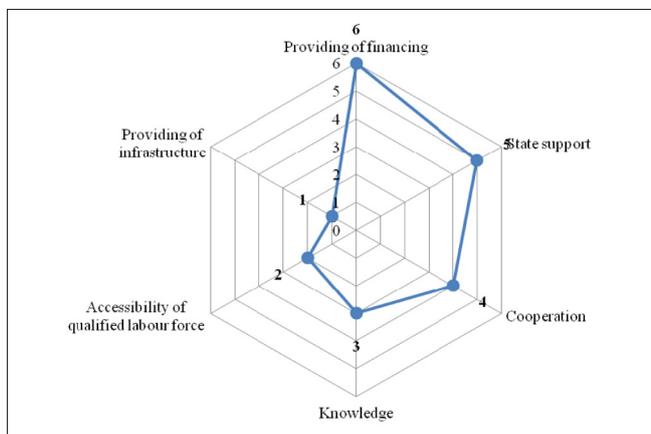


Figure 4. Result of evaluation of factors influencing the intensification of dairies with the method of hierarchy analysis (Results of expert evaluation of the use of hierarchy analysis)

The hierarchy analysis may very significant in evaluation of the situation that requires a collective approach. The more qualified will be the evaluator the better will be the result. As evaluators may be experts, consultants, experienced employees and other competent persons.

The further development of dairying and its role in decreasing of social economic polarization in rural regions is related closely to effective regional policy that provides vast opportunities to facilitate the increase of income of rural households. But the increase of efficiency of regional policy requires involvement of state and regional institutions, a strict responsibility of politicians and precisely elaborated social economic support measures on the state level.

In development activities of rural areas, in this context, an important role is played by creation of effective cooperation between the local self-government and the functioning of enterprises in rural territory, as well as by the policy of CAP in the area of the knowledge and innovative solutions in relation to elaboration and application of different technologies oriented to the increase of biological potential of domestic animals and its fuller use.

Conclusions

- In Latvia, the agricultural land and its use is subjected to considerable changes.
- The intensity of milk production per unit of agricultural land is characterized by great differences caused by political, social, economic and technological factors.
- Unfavourable developments in changes of milk yield and the number of dairy cows influence negatively the income of dairies.
- Therefore, the state intervention measures should not create sharp changes in the quantitative and qualitative structure in the herd of dairy farms.

- The changes in the specific income of the dairies in relation to the use of agricultural land indicate clearly to the increase of income polarization rate of economic active inhabitants employed in rural regions.
- In result of expert evaluation and inquiries of dairy farmers and future entrepreneurs of this field, as the most important factor in development of dairying and land use of dairies was recognized the financing. The evaluation of other factors differs.
- The method of hierarchy analysis may be useful in decision making by both, the starting and continuing dairy farmers.

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