

STABILITY EVALUATION OF THE NUMBER OF FARMERS FARMS AND DECLARED AGRICULTURAL LAND IN LITHUANIA

Virginija Atkocevičienė¹, lecturer; **Jolanta Valčiukienė**², Dr., lecturer,

Daiva Juknelienė³, lecturer

^{1,2,3}Institute of Land Management and Geomatics, Aleksandras Stulginskis University, Lithuania

Abstract. The beginning of the restitutional land reallocation reform in 1991 brought a rapid change in agricultural land utilisation and user groups resulting in the decrease of state land users' categories and the growth of private agricultural land areas used by farmers and other natural and legal entities. The aim of the article is to analyse the stability of farmers farms and their agricultural areas in Lithuania during the period between 2009 and 2014. The research estimates the stability of the number of farms and the utilised agricultural area in separate Lithuanian administrative units, i.e. municipalities. The survey results revealed that the most stable farmers' land holdings group was farms that utilised more than 10 ha of agricultural land. The number of farms stability coefficient in Lithuania is 1.08 on average. The complex index of the stability of the utilised agricultural area in Lithuania is 1.13 on average. The value of index is the lowest only in 8 of the 51 municipalities in Lithuania, i.e. from 1.00 to 1.09. This means that the farm land use in those districts is the most stable since the municipality has no possibilities to increase it significantly by ploughing up or otherwise using the abandoned and fallow land.

Key words: land used for agricultural purposes, farmers farms, used and declared agricultural land, farm size, stability.

JEL code:

Introduction

The agricultural sector in Lithuania has very important economic, social, environmental and ethno-cultural value and is considered to be a priority branch of the national economy. Lithuania should implement agricultural economic policies in order to create favourable conditions for farming and compete effectively on the EU single market. Successful activity of farms is heavily dependent on primary factors of production – rational utilisation of land, labour and capital. Larger areas of owned land do not necessarily show an increase in the production of income as higher income can be expected if additional land areas enable efficient use of agricultural machinery and labour. Higher income can also be received due to specialisation. However, the EU's main agricultural development trend is still holding pieces of consolidation of agricultural units. As demonstrated by the experience of other countries, this is happening at the expense of small farms since the number of small farms is declining and the number of medium-sized farms is growing.

Since the beginning of land reform in independent Lithuania in 1997, the existing

practice has been to design only land plots rather than farms as the latter were required by law to be registered as land territorial units. This resulted in the decline of land plot size and the scatter of these plots. Since the formation of the farm land holdings was left to chance, the restructuring of the layout of the plots faced the repeated land management works during the preparation of land consolidation projects.

At present, indicators characterising agricultural land management and use in Lithuania are still associated with the ongoing land reform – the restoration of the ownership of land and public land sales as well as with the development of farm land holdings, when acquiring and leasing of the land owned by other landowners. Land reform process especially had impact on the changes of agricultural land structure according to users. The number of farmers is increasing, while the number of agricultural companies and other agricultural enterprises and their controlled land is decreasing (Valčiukienė, 2015).

A number of Lithuanian and foreign scientists (Aleknavičius, 2007; Makutenienė, 2004; Abalikstienė, Stravinskiene 2011; Marsden et al.,

¹Corresponding author. Tel.: + 37061860164; fax: + -. E-mail address: valciukienejolanta@gmail.com.

2008; Hazell et al., 2010; Davidova et al., 2013; Silva et al., 2014; Graeub et al., 2015 and others) analysed the change of agricultural land and agricultural land areas as well as the change in the size of farms, land use peculiarities.

When analysing the use of land resources in Lithuanian farmers farms, Z. Kazakevicius (2011) states that despite the fact that the variable cost productivity and profitability has declined, the use of agricultural lands in farmers farms is improving.

P. Aleknavicius et al. (2012) also analysed agricultural land conversion works carried out in the independent Lithuania. In order to create favourable conditions for agricultural land users, it is recommended to improve agricultural policies and laws, providing for support for farmers to purchase the land within the boundaries of their prospective land use and to start using the abandoned land.

The research aim – to analyse the stability of farmers farms and their agricultural areas in Lithuania during the period between 2009 and 2014.

The following tasks were raised for the achievement of the aim:

- 1) to analyse the variation trends of farmers farms as well as used and declared agricultural land in Lithuania;
- 2) to perform the stability assessment of the number of farms, their use and declared agricultural land in individual Lithuanian administrative units – the municipalities of the districts.

The scientific literature and legal documents, analysis and synthesis, statistical indicators and analysis of mathematical processing as well as comparative analysis were used for the implementation of the above mentioned aim and tasks. The obtained results were processed by GIS technologies. The study was conducted using the data from the Department of Statistics, the National Land Service under the Ministry of Agriculture and Lithuanian Agricultural

Information and Rural Business Centre within the period of 2009-2014. In assessing variation trends of agricultural land area used by agricultural entities the authors took into consideration the fact that the available information of both the Department of Statistics as well as information obtained from the analysis of the areas declared, did not fully reflect the real situation.

The stability assessment of the number of farmers farms and the utilised and declared agricultural area of the country's territory were analysed assuming that only the constantly used territory and territorially related farming land areas (hereinafter - agricultural land areas) of sufficient size ensured the economic stability of the farm. To achieve this, the authors carried out the statistical analysis of the indicators of all municipalities of the Republic of Lithuania. The studies used indicators reflecting the stability of farm land use (utilised agricultural land area change, farm size changes). Land use stability was expressed as indices - coefficients indicating the degree of deviation. The coefficient value of the most stable studied phenomena is 1.

Research results and discussion

Indicators characterising agricultural land management and utilisation are related to an ongoing land reform – the restoration of the ownership of the land and public land sales as well as the development of farm land holdings, acquiring and leasing of the property of other landowners. In 2014, Lithuania had about 500 thousand hectares of state-owned agricultural land that could be privatized or used for farming (excluding land used by state-owned enterprises, scientific and educational institutions as well as state-owned land used by land and gardeners' communities as well as about 25 thousand hectares of forests situated in the state-owned agricultural lands).

The increase of private land area results in the increase of land owners number. However, land area per one owner - physical person remains

roughly the same: 5-6 hectares (Table 1). In addition, the land holding of one owner comprises two plots of land on average - real estate cadastre and registry units. It can be explained by the fact that the property rights are

restored to the smaller portions of the land area belonging to the candidates as well as the fact that the privatized individual agricultural land holding is no more than 2-3 ha.

Table 1

Variation of the number of agricultural land owners and the private land holding area in Lithuania

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Physical persons						
Number of owners	551768	563991	569795	573431	575847	577471
Private land area, ha	2877415	2927267	2965801	3017532	3086774	3167945
Per owner, ha	5.2	5.2	5.2	5.3	5.4	5.5

Source: the data of the State Enterprise Centre of Registers

During the analysis of farms, the development of the formation of agricultural entities' farms is more important than the variation of the number of landowners. The data of Lithuanian Agricultural Information and Rural Business Centre indicates that according to the agricultural land area declared by all agricultural land entities in 2013, the average farm size in Lithuania was 18.5 ha, i.e. by 5.7 % higher than in 2012, and by 23.3 % higher than in 2009. In 2013, there are 5.3 % fewer farms declared by agricultural entities in comparison with the year 2012, the declared area increased slightly by 0.2 %. Although in 2013, as in the previous years, the farms up to 5 ha amounted to more than 50 % of all farms with declared land use, in 2013 their number decreased by 7.4 %. Compared to 2009, the number of these farms decreased by 18.0 thousand, or 19.0 %. The group of farms of 5.1-10 ha is decreasing every year. Over the analysed period the number of the farms of this group fell by 14.5 %, however the structure part

has changed only slightly. Compared to 2009, in 2013 the number of farms in both groups from 10.1 to 20 ha and from 20.1 to 50 ha decreased by 12.4 and 7.8 %. However, the groups' share in the structure of farms increased only slightly. During the analysed period, the number of farms in farm groups of 50.1 to 100 ha and 100.1 to 500 ha has increased by 15.2 % and 34.4 % respectively. In the largest group of farms – of more than 500 hectares – the number of farms and their part of the structure during 2009-2013 has changed slightly. Farm size variation is affected by the fact that farms have the opportunity to increase their used land by cultivating derelict and abandoned former land use areas. During the implementation of the Lithuanian Rural Development Programme 2007-2013 of the financial assistance and other conditions for the economic development, the total declared agricultural land area of farm holdings increased up to 2,836.6 thousand ha in 2014 or slightly more than 7 % (Table 2).

Table 2

The change of agricultural land use area in Lithuania, thou. ha

Indicators	Year					
	2009	2010	2011	2012	2013	2014
Declared area	2648.2	2687.3	2736.5	2784.3	2803.2	2836.6
Increase over a year	+39.1	+49.2	+47.8	+18.9	+33.4	+23.7

Source: data of Agricultural Information and Rural Business Centre

One of the most important indicators characterizing the relatively largest land user group - farmers, is the change in number, average size and utilized land area and average size (Table 3).

Table 3

The increase of the number of farms registered in the farmers farms register and the declared land area in Lithuania

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Number of farms (all farms)	108312	107308	109184	111742	114626	117457
Utilised (declared) agricultural area, ha	2005865	2053547	2125484	2197308	2293084	2359468
Average farm size, ha	18.5	19.1	19.5	19.4	20.0	20.1

Source: data of the State Enterprise Centre of Registers

According to the data provided, all three indicators tend to increase. In 2009 - 2014 the number of farms increased by 8.4 %, the area of utilised and declared agricultural land – by 17.6 %, while in 2014 the average declared farmland farm size in Lithuania increased by 8.6 % and was 20.1 ha.

From a specified number of registered farms one should single out small-scale farms, which could be economically viable only in a narrow specialisation and intensive production. However, as seen in Table 4, during the analysed period the number of such farms experienced the most

rapid growth in Lithuania. It should be noted that the number of very small farms (0-3 ha) increased in suburban areas adjacent to major Lithuanian cities during the period of 2009-2014: in Vilnius district – from 2382 to 3297; in Kaunas district – from 1267 to 1750; in Klaipeda district – from 1555 to 1849; in Trakai district – from 836 to 1259. It can be assumed that a substantial proportion of such farms were created in order to acquire the right to build a dwelling house (the so-called "farmstead") on land plot owned in rural area however real economic activity is not available on such farms.

Table 4

The growth of the number of farmers farms in Lithuania according to their area

Indicators	Year (January 1)					
	2009	2010	2011	2012	2013	2014
Number of farms up to 3 ha	26200	27023	28249	29678	31153	32737
Percentage compared to January 1, 2004	294.1	303.4	317.1	333.2	349.7	367.5
Number of farms of 3-10 ha	39718	38645	38886	39758	40577	41783
Percentage compared to January 1, 2004	160.9	156.6	157.6	161.1	164.4	169.3
Number of farms >than 10 ha	42394	41640	42049	42306	42896	42937
Percentage compared to January 1, 2004	161.9	159.0	160.6	161.6	163.8	164.0

Source: data of the State Enterprise Centre of Registers

As shown in Table 4, the most stable farmers' land holdings group is farms that use more than 10 ha of agricultural land: their number during the period of 2009-2014 increased by only 7.9 %. These farms make up 36.5 % of all farms

and only 7.8 % from all land owners – physical persons. However, this is the promising group of farms, from which the authors can judge about the farms land use stability.

According to the aggregated statistical data of the agricultural land declaration disclosed by the Agricultural Information and Rural Business Centre, in 2014 medium and large farms in terms

of size and the declared land areas as follows:
84 % of land is used by personal holdings, 16 %
– by holdings of legal persons (Table 5).

Table 5

**Farms larger than 10 ha and agricultural land used by them in 2014
(aggregated data of agricultural land and crop declaration)**

Interval of declared area, ha	Farms of physical persons			Farms of legal persons		
	number of applications	land area, ha	per 1 farm, ha	number of applications	land area, ha	per 1 farm, ha
10.01 – 50	30624	630929	20.6	182	4741	26.0
50.01 – 100	5154	358493	69.6	106	7517	70.9
100.01 – 200	2862	395325	138.1	87	12258	140.9
200.01 – 300	886	215408	243.1	66	15773	239.0
300.01 – 400	388	133390	343.8	36	12339	342.8
400.01 – 500	193	86188	446.6	36	16021	450.0
More than 500	270	214767	795.4	232	321030	1383.8
Total:	40377	2034500	50.4	745	386679	519.0

Source: data of the State Agricultural Information and Rural Business Centre

Another indicator of farm viability, is the alterations of land area acquired to ownership. The larger part of the owned agricultural land area shows the increasing agricultural land holding stability and an opportunity to plan long-term investments in agricultural production development. However, the basic indicator of the investigation is the farm area of the utilised land rather than the possession of owned land. Geographically uneven land utilisation conditions (natural, economic etc.) of the country were taken into account, thus the peculiarities of farm land utilisation stability were examined in detail, by identifying municipalities, stability of the number of utilised and declared land use area as well as farms.

Utilised and declared agricultural area stability. In 2014, the declared area of agricultural land in Lithuania amounted to 2846.6 thousand ha, of which non-agricultural areas used for the cultivation of plants amounted to 33.4 thousand hectares, agricultural area used for the cultivation of plants (including fallow) amounted to 2813.3 thousand ha. According to the data prepared by the State Land Fund

records of the state enterprise State Land Fund of the Republic of Lithuania, by January 1, 2015 there were 3,467.6 thousand ha of agricultural land throughout the country. The study excludes agricultural land situated in forestry, water treatment, conservation and land for other purposes from the area i.e. a total of 105.7 thousand ha (the used data is prepared by the country's land fund public accounting data of the State Enterprise Centre of Registers on 01/01/2014). The difference – agricultural land possible to use for farming in the land used for agricultural purposes consists of 3,361.9 thousand ha. The ratio of the utilised agricultural land area with this statistical area in Lithuania ($2813.3:3361.9$) = 83.7 %. In separate municipalities, this percentage ranges from 41.0 to 100.0. The land use stability coefficient $K_1 = 1 \pm [(S_1 - S_2): S_1]$ is estimated according to this percentage, where S_1 – agricultural land area situated in the land used for agricultural purposes by January 1, 2015, S_2 – land use area declared on 2014, utilised for agricultural activities. In Lithuania the average value of $K_1 = 1.16$. The lowest value of K_1 (from 1.00

to 1.09) was determined in Joniskis, Sakiai, Kėdainiai, Kretinga, Marijampolė, Biržai, Šiauliai, Panevėžys, Radviliskis, Silalė and Mazeikiai districts (Figure 1).

In Lithuania, the changes of all declared agricultural land plots used for agricultural activities amounted to + 141.4 thousand ha (from 2792.0 to 2650.6) or 5.3 % in the period of 2009-2014. In separate municipalities, this percentage ranges from 0 to 60. The stability coefficient of the total of utilised agricultural land area K_2 was calculated using the following formula: $K_2 = 1 \pm [(S_2 - S_3) : S_3]$, where S_2 - land use area declared on 2014 utilised for agricultural activity, S_3 - land area declared in 2009 used for agricultural activity and situated in the land used for agricultural purposes. In Lithuania the average value of $K_2 = 1.06$. The minimum value of the coefficient K_2 (from 1.00 to 1.01) was determined in Kelme, Marijampolė,

Panevėžys, Mazeikiai and Jurbarkas districts (Figure 1).

Meanwhile in Lithuania, the changes in the agricultural land areas utilised and declared by farmers farms for the period 2009-2014, amounted to + 35.4 thousand hectares (from 2359.5 to 2005.9), or increased by 17.6 %. In separate municipalities, this percentage ranges from 13 to 40. The stability coefficient K_3 of the utilised agricultural area in farmers farms was calculated by the following formula: $K_3 = 1 \pm [(S_5 - S_4) : S_4]$, where S_5 - land use area declared in 2014 utilised for agricultural activity in farmers farms, S_4 - land use area declared in 2009 utilised for agricultural activity in farmers farms. In Lithuania the average value of $K_3 = 1.18$. The minimum value of the coefficient K_3 (from 1.03 to 1.09) was found in Kalvarija, Marijampolė, Akmenė, Joniskis, Pakruojis, Raseiniai, Kazlų Rūda, Sakiai, Vilkauskis and Biržai districts (Figure 1).

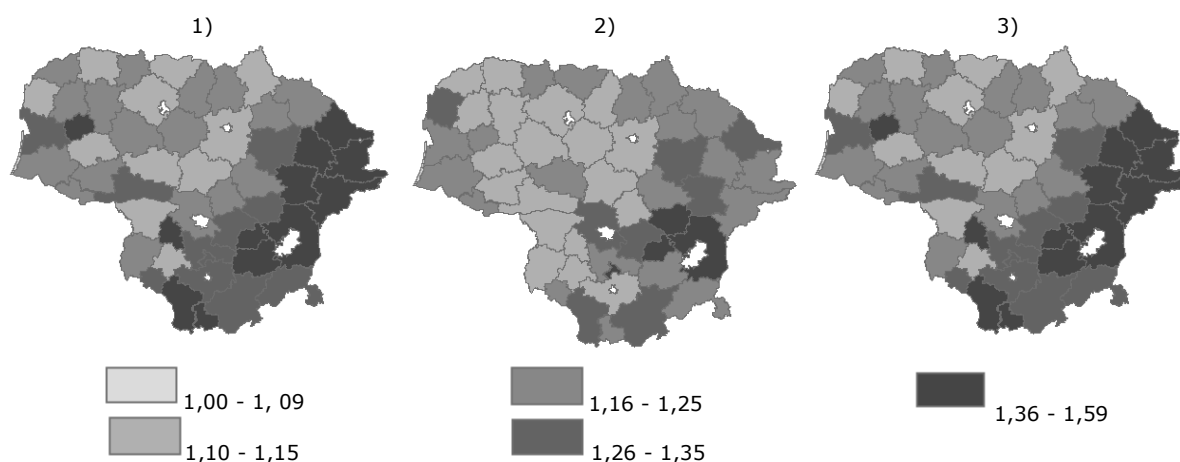


Fig.1. 1) Land use stability coefficient K_1 ; 2) Stability coefficient of all utilised agricultural area K_2 ; 3) Stability coefficient K_3 of the utilised land use area in farmers farms

The complex index of the stability of the utilised land use area was calculated as the mean of the sum of all three coefficients: $KS = [(K_1 + K_2 + K_3) : 3]$. In Lithuania the average value of $KS = 1.13$. The lowest value of the

coefficient K_5 (from 1.00 to 1.09) showed Joniskis, Marijampolė, Sakiai, Kėdainiai, Biržai, Raseiniai, Akmenė and Vilkauskis districts (Figure 2).

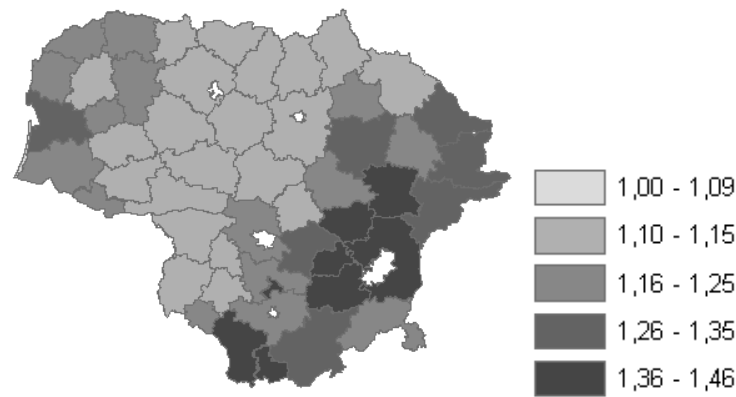


Fig. 2. **The stability complex indicator of the utilised agricultural area, KS**

According to the study results, higher percentage of undeclared agricultural land directly correlates with a more unstable land use of farms situated in the territory of the municipality due to the possibilities to increase them by cultivating fallow or other undeclared areas. The most stable land use is in the municipalities where the declared area of agricultural land is close to the area specified in the land fund accounts. Also, the smaller changes of agricultural areas used in land use and declared by total agricultural entities indicate more stable land use of farms since it can be stated that the municipality has no possibilities to

increase them significantly by ploughing up or otherwise using the abandoned and fallow lands.

Stability of the number of farms. The data for estimation regarding the number of farmers farms registered in Lithuanian municipalities and their utilised (declared) land use area were determined according to the Lithuanian state land fund accounting data (for the state of 1 January) annually published by the State Enterprise Centre of Registers (until 2014, inclusively). The data on the changes in the number of farms according to their size in Lithuania during the 5-year period are presented in Table 6.

Table 6

Variation of the number of registered farmers farms in terms of their size

Indicators	Agricultural land area, ha	Number of farmers farms		Difference	
		In 2009	In 2014	unit	percentage
Large and small farms	0 – 10	65918	74520	+8602	13.0
Medium-sized and large farms	> 10	42394	42937	+543	1.3
Total	x	108312	117457	+9145	8.4

The data of the analysis indicate that the number of functioning, i.e. economically viable medium-size and large farms in Lithuania is more or less constant compared to small farms, whose reasons of intensive number increase have already been discussed. The number of farms stability factor $K_U = K_4$ was calculated by the following formula: $K_4 = 1 \pm [(U_2 - U_1) : U_1]$, where U_1 - the number of farms that use more

than 10 hectares of farmland in 2009. U_2 - the relevant number of such farms in 2014. In Lithuania the average value of $K_4 = 1.08$. The minimum value of coefficient K_4 (from 1.00 to 1.02) showed Birstonas, Jonava, Kaunas, Klaipeda, Kazlu Ruda Akmene, Rokiskis, Kedainiai, Prienai, Skuodas, Silute, Pasvalys, Jurbarkas, Silale, Rietavas and Moletai districts (Figure 3).

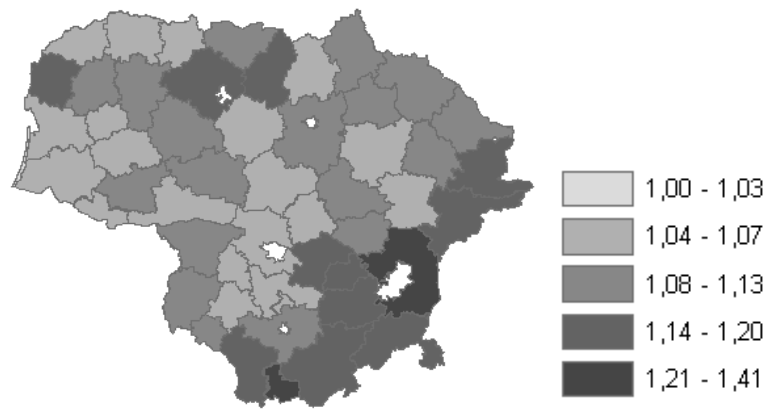


Fig. 3. **Stability coefficient of the number of farms KU**

Rational farm size varies due to a number of conditions. The maximum profit is the most important goal of the market economy but no less important is farm stability. Therefore, it is important to develop a farm business, which has a long-term perspective. The most stable ones are large family farms that employ diligent and skilled members of the family as family members are more motivated to achieve good results.

Conclusions, proposals, recommendations

1) Private land areas in Lithuania are tendentially increasing resulting in the increase of the number of land owners. One owner – a physical person owns land holding area of 5-6 hectares, which are often scattered over by two plots of land on average. In this period, the number of farms in Lithuania increased by 8.4 %, the number of small farms having increased the most (particularly in peri-urban areas) and the number of medium-sized and large farms did not change significantly. In Lithuania, the average declared size of farmland farm increased by more than 2 hectares (or 8.6 %) during the analysed period and currently consists of about 20.1 ha.

2) During the analysed period, land use areas declared in Lithuania increased even by 17.6 %. It is assumed that it was influenced by the financial support of measures of Rural Development Programme 2007-2013 and the timely implementation of the other conditions

for the development of farm economy. The stability complex index of the utilised land use area in Lithuania is 1.13 on average. The value of this index is very low, i.e. from 1.00 to 1.09, only in 8 of the 51 municipalities in Lithuania. This means that in those areas farm land use is the most stable since the municipality has no possibilities to increase it significantly by ploughing up or otherwise using the abandoned and fallow land.

3) The number of functioning, i.e. economically viable medium-size and large holdings in Lithuania during the analysed period is more or less constant. The most stable farmers' land holdings group is households that use more than 10 hectares of agricultural land. In Lithuania, the average stability coefficient of the number of holdings is 1.08.

4) Survey results suggest that successful competition in agriculture may be ensured by land consolidation, whereas the preparation of rural development land management projects is also recommended so as to transform agricultural land holding and guarantee the rational use of agricultural land: to form farming land plots having similar characteristics and determine their recommended use (composition of the planned agricultural crops and crop rotations) with regard to economic policy and environmental protection requirements as well as to identify other land management

measures required for the functioning of the farm. The competitiveness of the farm largely

depends on state subsidies and the EU support as well.

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