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The comparative analysis of Lithuanian farms economic performance in the context of selected EU countries

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Abstract

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The aim of the paper was to present the economic performance of Lithuanian farms in the context of the selected European Union (EU) countries. The analysis was conducted using the Farm Accountancy Data Network (FADN) data on average over the period 2015–2018. The results are presented at the EU country-level, both for the whole sample and disaggregated by the farming system, namely, specialist cereals, oilseeds and protein crops (COP) and specialist milk systems. Six Central East European Countries (CEECs), Germany and France were chosen as benchmarking countries. The EU-28 average as a benchmark value also was considered. The comparative analysis of farms economic performance is based on farm size indicators, productivity and profitability ratios. According to the research results, Lithuanian agricultural sector is characterized as having the lowest level of land productivity and the highest level of profit margin. The Lithuanian COP farms in the context of the selected CEECs can be described as having a moderate level of economic performance and still lag far behind as compared with the countries-leaders for cereal production. Lithuanian specialist milk farms indicate a low economic performance concerning production level and productivity accompanied by a profitability and profit margin above the leading European producers for milk.

Keywords: agriculture; European Union countries; specialist milk system; specialist cereals, oilseeds and protein crops system

Introduction

Lithuanian agriculture plays a vital role in the whole economy (in terms of export share) and particularly in rural areas which are highly dependent on primary agriculture (European Commission, 2020). EU Member States need to prepare national Strategic Plans for the Common Agricultural Policy (CAP) for the period 2021–2027 based on Strengths, Weaknesses, Opportunities, and Threats analysis of the agricultural sector. In order to provide justifications for priorities for intervention, providing an evidence-based rationale for strategic choices and to identify the measures under the specific objective "*support viable farm income and resilience across EU territory to enhance food security*" the economic analysis of the sector is required (European Commission, 2018). To identify the sectors with undergoing difficulties, the analysis of farms viability within different types of farming is supposed to be conducted. The comparison analysis of farms' economic performance across agricultural systems in the country allows ranking best and worst performing systems, and the analysis of agricultural systems in a context of other countries provides some additional insights assessing the situation of a certain system.

The economic performance issues of farms are on the high agenda of policy planners (European Commission, 2018) and academia. Figure 1 presents the scientometric analysis obtained through the VOSviewer software with scientific publications presented in English language (ar-

ticles, proceeding papers and reviews) extracted from the Web of Science (all databases) and Scopus scientific platforms during the timeframe of 2004–2021. 126 publications were selected according to the following keywords: TOPIC (agricultural sector) AND TOPIC (economic analysis) AND TOPIC (European Union). The VOSviewer software identified four clusters of terms (each with a different colour) where the terms with greater circles have the higher weight. The cluster in yellow colour highlights the importance of CAP to the agricultural sector. The cluster in green colour stresses the importance of product exports and competitiveness in the world market. The fourth cluster (presented in blue colour) is attributed to such important issues as food security, consumption and employment. The cluster in red colour is the largest and emphasizes the issues related to the agricultural sector's model concerning its sustainability, efficiency and productivity.

Lithuania's agricultural sector economic performance issues are analyzed as a case study in numerous studies (Fertő & Stalgienė, 2016; Savickienė et al., 2017; Baležentis et al., 2018; Baležentis et al., 2019; Balezentis et al., 2020; Morkunas & Labukas, 2020). In order to reveal the economic situation of Lithuanian farms, the comparative analysis with other countries is often conducted (Średzińska, 2016; Namiotko et al., 2017; Reidla & Nurmet, 2017; Caruso & Greblikaitė, 2018; Sapolaitė et al., 2019; Kryszak, 2018; Volkov et al., 2020; Poczta et al., 2020). Most often the comparative analysis is performed between homogenous countries considering their geographical location or/and common policy. The economic performance of Lithuanian farms usually is compared with other European Union country(ies) (Średzińska, 2016; Kryszak, 2018; Caruso & Greblikaitė, 2018; Sapolaitė et al., 2019; Veveris et al, 2019; Volkov et al., 2020; Poczta et al., 2020), Baltic countries (Reidla & Nurmet, 2017; Sapolaitė et al., 2019) and neighboring countries (Namiotko et al., 2017; Baležentis et al., 2019). To identify homogenous country groups in relation to farms' economic performance some authors employ cluster analysis (Średzińska, 2016; Kryszak, 2018; Poczta et al., 2020).

In this research countries for the comparative analysis are chosen according to the two main characteristics: 1) the CEECs that accessed the EU in 2004. The accession of the CEECs to the EU resulted in the launch of the regulations of the CAP and programs to support the development of the

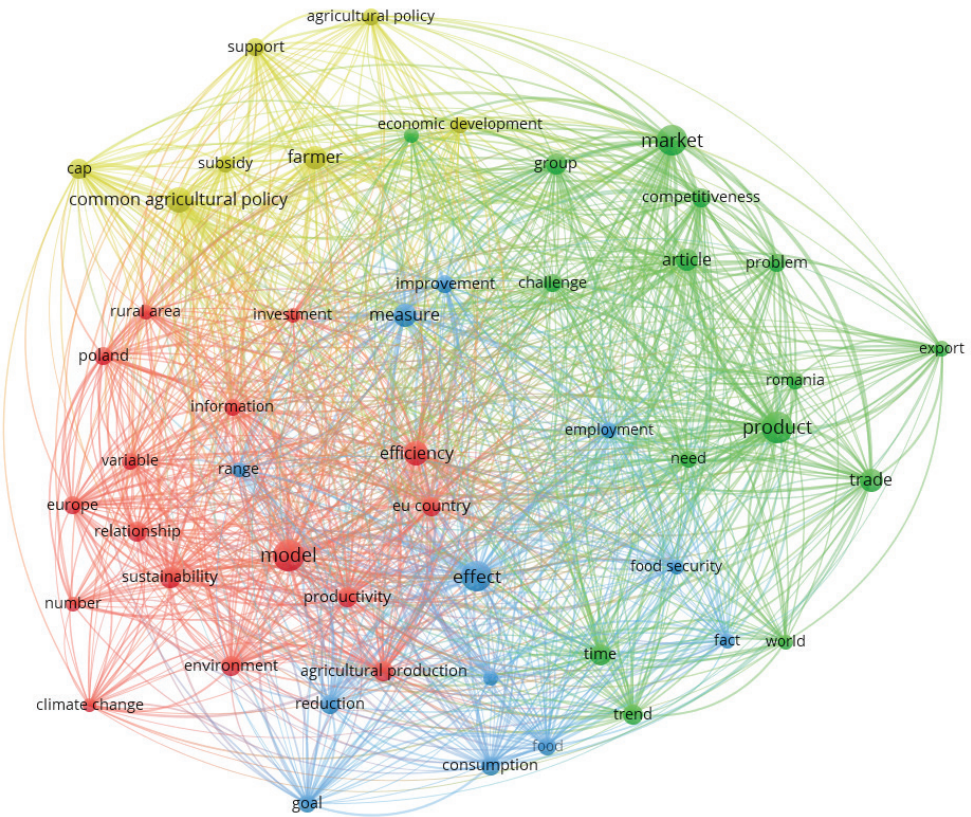

Fig. 1. Keywords co-occurrence map

agricultural sector; 2) the CEECs with a similar structure of agricultural sector in terms of small farms role.

Moreover, the main farming systems were considered in this research, namely, COP and specialist milk systems as cereals and milk sub-sectors are two of the most significant within Lithuanian agriculture, constituting in the structure of gross agricultural production 31.4% and 16.8% on average over the period 2015–2018 (Statistics Lithuania, 2021). What is more, the COP farms generated one of the highest farm net income per annual work unit (12.6 thousand EUR), and at the other end of spectrum, specialist milk farms had the lowest income (5.4 thousand EUR) across the main agricultural systems in Lithuania on average over the period 2015–2018 (EU FADN, 2021).

Based on this background the aim of this paper is to study the economic performance of Lithuanian farms in the context of selected EU countries and, more specifically, to compare the results of farms across agricultural systems.

Materials and Methods

To have insights into farms' economic performance FADN data on average over 2015–2018 was used for analysis. The results are presented at the EU country-level, both for the whole sample and disaggregated by the farming system. The FADN survey is the main instrument for the characterization of the farms' economic activities carried out across the EU countries. It is worth mentioning that the FADN database covers only commercial farms in the EU. FADN variables, farm size indicators and underlying productivity and profitability ratios to assess economic performance of farms are presented in Table 1.

Lithuanian agricultural sector is characterized by a highly polarized farm structure. According to the Farm Structure Survey, almost 76% of farms were less than EUR 8 thousand of Standard Output (SO) in size. What is more, farms with less than EUR 8 thousand of SO play an essential role in Lithuanian agriculture cultivating 22.8% of total utilized agricultural area (UAA) (FSS, 2016).

In view of the above, to present Lithuanian farms' economic performance in the context of other EU countries, the EU countries selection logic is as follows:

1) The CEECs that accessed the EU in 2004;

2) The CEECs with a high share of small farms;

3) The CEECs with a high share of UAA farmed by small farms.

Six CEECs countries which joined the EU in 2004 were selected for the analysis, namely, Estonia, Latvia, Lithuania, Hungary, Poland and Slovenia (Table 2).

The economic performance results of Lithuanian farms specialized in COP and milk were compared with the leading EU cereals and milk producing countries, namely, France

Table 1. FADN variables, farm size indicators and underlying productivity and profitability ratios for farm analysis

	Indicator	FADN variables		Indicator	FADN variables	Study/source
Farm size indicators	Economic size, thousand EUR	SE005	Productivity ratios	Total output/UAA, thousand EUR/ha	SE131/SE025	Bertoni et al. (2016)
	Utilized agricultural area (UAA), ha	SE025		Total livestock output/LU, thousand EUR/LU (for specialist milk system)	SE207	Špička (2014)
	Annual work unit (AWU)	SE010		Total output/total input (Total factor productivity)	SE131/SE270	Uthes & Herrera (2019)
	Total output, thousand EUR	SE131		Gross farm income/AWU, thousand EUR/AWU	SE410/SE010	Keszthelyi & Pesti (2012)
	Current subsidies (Total subsidies – excluding on investments), thousand EUR	SE605	Profitability ratios	FNI/UAA, thousand EUR/ha	SE420/SE025	Gołaś et al. (2020); Poczta et al. (2020)
	Total intermediate consumption (specific costs and overheads), thousand EUR	SE275		FNI/LU, thousand EUR/LU (for specialist milk system)	SE420/SE080	Poczta (2020)
	Depreciation, thousand EUR	SE360		FNI/total output (Profit margin), %	SE420/SE131	Baležentis et al. (2019)
	Total external factors, thousand EUR	SE365				
	Subsidies on agricultural investments	SE409				
	Farm net income (FNI), thousand EUR	SE420				

UAA – Utilized Agricultural Area, AWU – Annual Work Unit; LU – total livestock units

Source: EU FADN (2021)

Table 2. Share of farms and share of UAA farmed by small farms in CEECs in 2016

CEECs that joined the EU in 2004	The share of small farms*,%	The share of UAA farmed by small farms, %
Estonia	66.0	8.9
Latvia	76.8	22.8
Lithuania	75.9	19.8
Hungary	83.2	8.7
Poland	64.8	22.4
Slovenia	58.8	24.2
Slovakia	68.3	3.8
Czech Republic	31.7	1.6

Note: Small farm has been defined as one with SO of less than EUR 8 thousand.
Source: Own calculations based on Eurostat (Eurostat, 2021)

and Germany for benchmarking. The benchmark value also includes the EU-28 average.

Results and Discussion

The indicators reflecting farm size in the selected EU countries for the whole agricultural sector on average over 2015–2018 are presented in Table 3. The great variation is observed in terms of the average physical farm size across the selected EU countries (Coefficient of Variation, CV 83%): the largest average farm size is recorded in Estonia, at 137.6 ha of UAA, and at the other end of the range, the smallest farm size is estimated in Slovenia (10.2 ha of UAA). Estonian farms can benefit most from economies of scale compared to other analysed countries' farms.

An average labour input per farm ranged from lows of 1.3 AWUs per farm in Slovenia up to an average of 2.0 AWUs per farm in Latvia. The average economic size of farms varies between the selected EU countries with EUR 23.0 thousand in Slovenia on one end, and EUR 107.9 thousand in Estonia, on the other. All selected countries except Estonia had an average economic size below the EU-28 average. The same tendency is observed concerning the average total output per farm that ranges between EUR 26.3 thousand and EUR 117.3 thousand, in Slovenia and Estonia, respectively. In terms of average subsidies per farm, the Estonian farms benefited most from subsidies (EUR 27.0 thousand per farm), while the Polish farm received, on average, the lowest subsidies (EUR 5.9 thousand per farm). On the other hand, current subsidies accounted for about 20% of total receipts (total output including the current subsidies) in all selected countries. The costs for depreciation per farm in Poland, Hungary, Slovenia and Lithuania were below the EU-28 average. Large differences between countries are evident regarding costs for total external factors (CV 94.7%): Estonian farms had the highest external costs due to high wages paid (EUR 17.5 thousand per farm). The lowest costs for total intermediate consumption were found for Slovenian farms, followed by Polish and Lithuanian farms, i.e., these costs were about 2-fold lower than the EU-28 average. There was a 3-fold difference between the highest FNI per farm (Hungary) and the lowest (Slovenia). Average FNI per farm in the selected EU countries (except for Hungary) is estimated significantly below the EU-28 level.

Relative farm productivity and profitability indicators were considered in order to identify the economic performance of farms across the selected EU countries (Table 4). As suggested by the data on land productivity, the Lithuanian farms showed the lowest result (0.77 thousand EUR/ha) followed by Estonia (0.85 thousand EUR/ha) and Latvia (0.92 thousand EUR/ha), respectively reaches only 35.7%, 39.6% and 42.9% of the EU-28 level. Total factor productivity re-

Table 3. Farm size and farms' economic performance results (in thousand EUR) in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Economic size	UAA, ha	AWU	Total output	Current subsidies	Intermediate consumption	Depreciation	External factors	Subsidies on agricultural investments	FNI
Estonia	107.9	137.6	1.8	117.3	27.0	93.9	18.7	24.3	4.2	8.7
Hungary	57.7	45.5	1.5	73.6	16.0	49.7	6.3	12.6	0.6	20.3
Lithuania	32.9	48.8	1.6	37.5	10.7	25.0	8.9	4.6	3.6	11.6
Latvia	48.8	67.4	2.0	62.2	16.7	46.2	10.6	10.0	2.7	13.4
Poland	31.7	19.6	1.6	28.8	5.9	18.2	5.1	2.3	0.7	8.7
Slovenia	23.0	10.2	1.3	26.3	7.2	17.9	8.3	1.0	1.8	6.8
EU-28	78.5	36.0	1.5	77.5	12.2	47.5	9.7	12.0	0.6	20.2
CV, %	61.4	83.0	15.5	60.4	55.9	69.4	50.4	94.7	65.8	42.1

Source: Own calculations based on FADN (EU FADN, 2021)

lates to the ratio of total output to the total input. The higher this ratio the higher is the productivity. Polish farms showed the highest total factor productivity, and this was the only ratio above the EU-28 level within analysed countries. Gross farm income is one of the main income indicators and is calculated from the sum of total output and current subsidies, deducting total intermediate consumption, taxes and VAT balance. Estonia ranks highest for gross farm income per AWU (reaches the average of the EU-28), followed by Hungary, whose figure is slightly below the EU-28 level. The remaining four countries significantly lag the EU-28 average. The greatest differences between the selected countries are observed regarding FNI per ha of UAA (CV 63.4%). The lowest FNI per UAA per farm was in Estonian farms, which reached only 11.3% of the EU-28 average, on the other end of the spectrum; Slovenian farms were most profitable and exceeded the EU-28 average by 19.5%. Out of the selected countries, Lithuania is leading in terms of profit margin, which exceeds the EU-28 average by 19.1% and at the other end of the range, Estonia ranks last and reaches only 7.4% of the EU-28 level. The results concerning productivity and profitability in Lithuanian farms are in line with Średzińska (2016) findings.

The indicators for COP farms on average in the period of 2015–2018 reflecting farm size in the selected EU countries are presented in Figure 2 and Table 5. According to the FADN sample, the share of COP farms in the selected EU countries varied from 7.3% to 40.3%, in Slovenia and Hungary, respectively (Figure 2). Total output per farm in Lithuania with a value of EUR 57.1 thousand, followed by Poland and Slovenia lag the EU-28 average. This value of Lithuanian COP farms reaches only 30.3% and 40.9% of Germany and France level, respectively.

As regards the selected countries, the economic size of the COP farms ranged between EUR 14.8 thousand and EUR 184.4 thousand, in Slovenia and Germany, respectively. Lithuanian COP farms exhibit much lower average economic farm size than German, France and Estonian farms. The average physical COP farm size expressed in ha of UAA, stood in between 12.0 ha for Slovenia and 225.2 ha for Es-

Table 4. Farm productivity and profitability results in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Total output/UAA, thousand EUR/ha	Total factor productivity	Gross farm income/AWU, thousand EUR/AWU	FNI/UAA, thousand EUR/ha	Profit margin, %
Estonia	0.85	0.86	27.31	0.06	7.4
Hungary	1.62	1.08	25.60	0.45	27.6
Lithuania	0.77	0.98	14.01	0.24	31.0
Latvia	0.92	0.93	15.91	0.20	21.6
Poland	1.47	1.13	10.02	0.44	30.2
Slovenia	2.58	0.97	11.88	0.67	26.0
EU-28	2.15	1.12	27.30	0.56	26.0
CV, %	50.2	9.8	41.6	63.4	36.6

Source: Own calculations based on FADN (EU FADN, 2021)

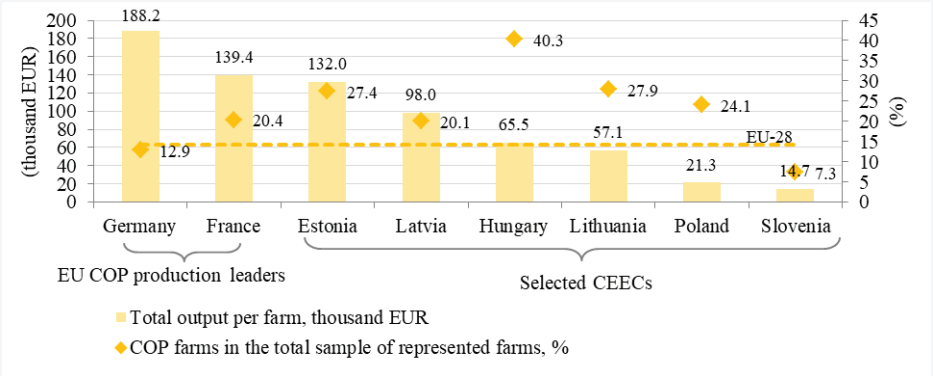

Fig. 2. COP farms total output per farm and share of COP farms in total FADN sample in selected EU countries, average of the years 2015–2018

Source: Own calculations based on FADN (EU FADN, 2021)

tonia. Lithuanian COP farms physical size exceeded the average of the EU-28 level, but it lagged the leading European producers for cereals. The moderate variation of the labour resources (AWU per farm) across the selected EU countries was determined (CV 26.8%) and the average AWU stood in between 0.7 for Slovenia and 1.9 for Latvia. It is noteworthy that family labour input made 77% of total labour input in Lithuanian COP farms. The most family labor-based COP farms across the selected countries were in Slovenia (98%) and Poland (92%). In the amount of current subsidies per COP farm, Poland, Slovenia and Lithuania still lag behind the EU-28 average, but Hungary, Latvia and Estonia already exceed it. Out of the selected countries, Lithuanian COP farms received the lowest amount of current subsidies per ha of UAA. Lithuanian COP farms costs for intermediate consumption per farm were about 3-fold lower than in Germany, Estonia and France. The costs for depreciation on Lithuanian COP farms were above the EU-28 level. The external factors costs vary considerably across the selected EU countries (CV 100.7%). These costs in Lithuanian COP farms were about 2-fold lower than the ones observed for the EU-28 average. As regards the inputs across the selected countries, the COP farms in the New EU Member States can be characterized as low-input production systems (except for Estonia), and these findings agree well with Volkov et al. (2019). The highest subsidies on investment per COP farm were found for Latvia and this value was 2.7 times higher than for Lithuania. In Lithuania, FNI per COP farm is estimated above the EU-28 and France level, however, reaches only 67.3% of the Germany level.

The COP farm productivity and profitability results across the selected EU countries are presented in Table 6. The land productivity expressed as total output per ha of UAA in Estonia, Lithuania, Latvia and Poland was below

Table 5. Farm size and farms' economic performance results (in thousand EUR) of COP farms in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Economic size	UAA, ha	AWU	Total output	Current subsidies	Intermediate consumption	Depreciation	External factors	Subsidies on agricultural investments	FNI
Estonia	119.1	225.2	1.5	132.0	38.7	109.3	27.4	25.8	4.9	10.1
Hungary	51.3	64.2	1.1	65.5	17.7	42.4	6.0	10.9	0.2	22.9
Lithuania	50.6	83.8	1.6	57.1	14.1	36.9	13.2	6.6	2.4	16.3
Latvia	86.5	142.6	1.9	98.0	26.1	71.2	21.9	14.2	6.7	19.2
Poland	23.9	26.1	1.3	21.3	6.9	14.3	4.7	2.3	0.6	6.3
Slovenia	14.8	12.0	0.7	14.7	9.2	13.0	6.1	0.5	0.8	4.0
France	148.1	124.5	1.3	139.4	31.3	103.0	30.0	21.6	0.2	14.0
Germany	184.4	150.1	1.6	188.2	51.0	124.9	32.4	52.6	0.2	24.2
EU-28	59.5	65.2	1.3	63.3	16.9	42.1	10.6	12.0	0.4	14.6
CV, %	71.9	68.5	26.8	68.0	62.9	68.4	65.4	100.7	124.8	50.9

Source: Own calculations based on FADN (EU FADN, 2021)

Table 6. Productivity and profitability results of COP farms in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Total output/UAA, thousand EUR/ha	Total factor productivity	Gross farm income/AWU, thousand EUR/AWU	FNI/UAA, thousand EUR/ha	Profit margin, %
Estonia	0.59	0.82	40.02	0.04	7.6
Hungary	1.02	1.10	36.01	0.36	35.0
Lithuania	0.68	1.01	20.66	0.19	28.6
Latvia	0.69	0.91	27.56	0.13	19.6
Poland	0.82	1.00	10.46	0.24	29.3
Slovenia	1.22	0.75	15.22	0.34	27.5
France	1.12	0.91	48.53	0.11	10.1
Germany	1.25	0.90	68.65	0.16	12.9
EU-28	0.97	0.98	29.12	0.22	23.0
CV, %	28.5	12.1	57.4	54.8	47.9

Source: Own calculations based on FADN (EU FADN, 2021)

the EU-28 average. Lithuanian land productivity per COP farm reaches only 54.3% and 60.8% of Germany and France level, respectively. The most efficient COP farms in terms of total factor productivity were in Hungary, Lithuania and Poland, which exceeded the average of the EU-28. As regards the ratio of the costs for intermediate consumption to total output per ha of UAA, Lithuania, Hungary and Germany ratio were above the EU-28 average (Figure 3).

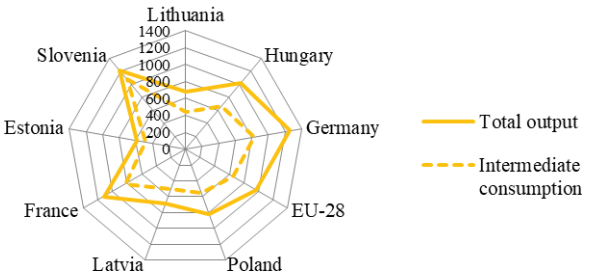

Fig. 3. COP farms total output and intermediate consumption in EUR per ha of UAA in the EU-28 and selected EU countries, average of the years 2015–2018

Source: Own calculations based on FADN (EU FADN, 2021)

German and French COP farms are leading in terms of labour productivity expressed as gross farm income per AWU across the analysed countries. The Lithuanian COP farms labour productivity lag the EU-28, French and German level, by 29%, 57.4% and 69.9%, respectively. Hungarian COP farms are leading in terms of FNI per ha of UAA, followed by Slovenian and Polish farms, which exceed the average EU-28 level, the other countries are below this level. As suggested by the data on profit margin of COP farms, the leading cereals production countries show much lower values if opposed to Hungary, Slovenia, Poland and Lithuania.

The indicators for specialist milk farms on average in the period of 2015–2018 reflecting farm size in the selected EU countries are presented in Figure 4 and Table 7. According to the FADN sample, the share of commercial specialist milk farms in the selected EU countries varied from 2.9% to 28.9%, in Hungary and Lithuania, respectively (Figure 4). Out of the selected countries, the total output per specialist milk farm in Lithuania is the lowest and reaches only 20.9% of the EU-28 average.

In an international comparison among the group of eight countries, the economic size of the specialist milk farms ranged between EUR 25.0 thousand and EUR 358.7 thousand, in Lithuania and Estonia, respectively. Lithuanian specialist milk farms lag far behind the EU-28 and the countries-leaders in milk production level. Within the selected countries for analysis, the average physical farm size expressed in ha of UAA of specialist milk farms ranged from 17.7 ha for Slovenia to 242.9 ha for Estonia. The average physical size of specialist milk farms in Lithuania lags the leading European producers for milk and the EU-28 average. Estonia is a leader in terms of LU per specialist milk farm among the group of eight comparator countries, on the other end of the spectrum, this figure for Lithuanian milk farms is the smallest and reaches only 28% of the EU-28 level. Large differences between the selected countries are also evident in the area of labour resources expressed in AWU: the lowest labour input was found for Lithuania, and, on the contrary, the highest AWU was observed for Estonia. Lithuanian specialist milk farms are essentially family labour based as family labour input made 81% of total labour input. On the contrary, family labour input made only 15% for Estonian and 17% for Hungarian specialist milk farms on average in 2015–2018. This finding accords closely with the results presented by Poczta et al. (2020).

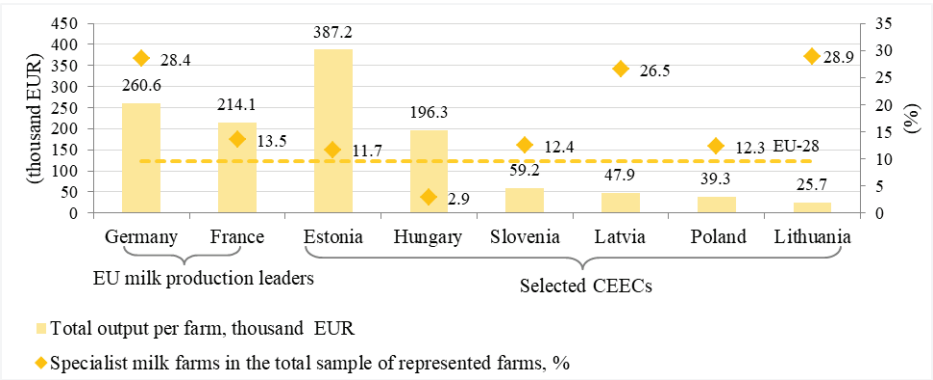

Fig. 4. COP farms total output per farm and share of COP farms in total FADN sample in selected EU countries, average of the years 2015–2018

Source: Own calculations based on FADN (EU FADN, 2021)

Table 7. Farm size and farms' economic performance results (in thousand EUR) of specialized milk farms in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Economic size	UAA, ha	AWU	Livestock units	Total output	Current subsidies	Inter-mediate consump-tion	Deprecia-tion	External factors	Subsidies on agricultural investments	FNI
Estonia	358.7	242.9	5.0	146.9	387.2	56.8	296.9	46.4	90.4	3.2	12.0
Hungary	160.4	83.5	3.7	77.4	196.3	52.1	152.7	15.1	46.3	0.7	32.4
Lithuania	25.0	29.6	1.6	16.1	25.7	8.4	17.6	7.3	2.3	2.5	9.0
Latvia	44.4	52.7	2.0	28.7	47.9	15.0	37.5	7.0	7.3	1.8	12.3
Poland	45.4	22.6	1.8	27.5	39.3	8.2	22.4	6.5	1.4	0.4	17.1
Slovenia	56.2	17.7	1.7	29.1	59.2	11.5	41.7	14.2	1.7	2.8	15.0
France	207.8	97.6	2.0	114.1	214.1	34.5	148.4	40.4	23.3	1.8	36.3
Germany	248.5	77.8	2.1	115.3	260.6	35.2	171.0	35.0	38.1	0.5	50.6
EU-28	118.9	38.9	1.7	57.1	122.6	16.9	80.8	15.6	14.1	0.8	29.0
CV, %	84.6	93.5	48.5	73.2	85.5	71.2	88.8	76.4	118.5	63.1	64.6

Source: Own calculations based on FADN (EU FADN, 2021)

In the amount of current subsidies per specialist milk farm, Poland, Lithuania, Slovenia and Latvia still lag behind the EU-28 average, while Hungary and Estonia figure exceed by 3-fold the EU-28 level. In the amount of subsidies per LU, the highest figure is observed for Hungary (674 EUR/LU), followed by Latvia (523 EUR/LU). Lithuania ranks third, and this figure is above the EU-28 average by 76%. Lithuanian specialist milk farms costs for intermediate consumption per farm were the lowest among the selected countries. The lowest values for the depreciation allowances for tangible fixed assets were found for Poland, Latvia and Lithuania, which in turn, reflects the low level of investment in these countries. Large differences are apparent across countries in terms of costs for external factors per farm (CV 118.5%) that range in between EUR 1.4 thousand and EUR 90.4 thousand, in Poland and Estonia, respectively. The costs for external factors of the Lithuanian specialist milk farms

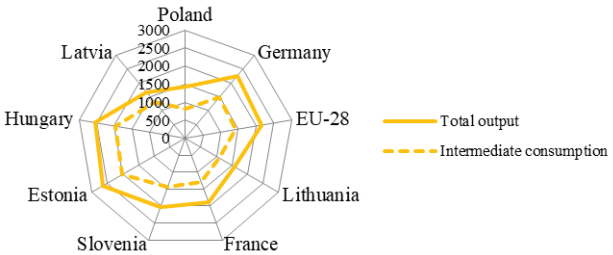

Fig. 5. Specialist milk farms total output and intermediate consumption in EUR per LU in EU-28 and selected EU countries, average of the years 2015–2018

Source: Own calculations based on FADN (EU FADN, 2021)

reaches only 16.5% of the EU-28 average. The highest subsidies on investment per specialist milk farm were found for Estonia. Lithuania's figure for subsidies on investment was about 3-fold higher than the EU-28 average. As regards FNI

Table 8. Productivity and profitability results of specialist milk farms in the EU-28 and selected EU countries per farm, average of the years 2015–2018

Country	Total livestock output/ LU, thousand EUR/LU	Total factor productivity	Gross farm income/AWU, thousand EUR/AWU	FNI/LU, thousand EUR/LU	Profit margin, %
Estonia	1.75	0.89	28.99	0.08	3.1
Hungary	1.62	0.92	25.26	0.42	16.5
Lithuania	1.10	0.94	9.95	0.56	35.1
Latvia	1.18	0.92	12.37	0.43	25.7
Poland	1.25	1.30	13.70	0.62	43.4
Slovenia	1.23	1.03	16.44	0.52	25.4
France	1.63	1.01	50.28	0.32	17.0
Germany	1.86	1.07	60.39	0.44	19.4
EU-28	1.78	1.11	33.92	0.51	23.6
CV, %	20.2	13.0	68.9	39.4	53.2

Source: Own calculations based on FADN (EU FADN, 2021)

per specialist milk farm, Germany farms are leaders, at the other end of spectrum, the lowest income observed for Lithuanian farms, which reaches only 17.8% of Germany and 31.1% of the EU-28 level.

The specialist milk farm productivity and profitability results across the selected EU countries are presented in Table 8. Germany ranks first in terms of specialist farms productivity expressed as total livestock output per LU. Lithuanian specialist milk farms' productivity is the lowest within the selected countries and significantly lags the Germany and EU-28 level. The most efficient specialist milk farms in terms of total factor productivity are Polish farms, followed by Germany farms. On the contrary, the lowest productivity is found for Hungary and Latvia. The same tendency was found for the ratio of the costs for intermediate consumption to total output per LU (Figure 5).

The lowest labour productivity expressed as gross farm income per AWU across the analysed countries was observed in Lithuanian specialist milk farms, which reached only 29.3% of the EU-28 average and significantly lag the leading milk producers' level. As suggested by the data on profit margin of specialist milk farms, Poland and Lithuania are leading and Estonia ranks last. As regards the economic performance of Lithuanian specialist milk farms, the results are in line with Reidla & Nurmet (2017).

Conclusions

The comparative analysis across the selected CEECs for whole agricultural sector revealed that Lithuanian farms can be characterized by medium level of production (across six CEECs ranks fourth for economic size and total output) and costs (across six CEECs ranks fourth for intermediate and external factors costs and ranks third for depreciation). The relative indicators indicated the Lithuanian agricultural sector having the lowest level of land productivity and the highest level of profit margin (due to lower external factors and depreciation costs and higher subsidies on investment).

The Lithuanian specialist COP farms in the context of the selected CEECs can be described as having a moderate level of economic performance and still lag far behind as compared with the countries-leaders in cereal production. The Estonian COP farms are leading in terms of economic performance within CEECs and almost reach Germany and France level. As regards the COP farms productivity and profitability, Hungarian farms are leading, while Lithuanian farms performed moderately. Lithuanian specialist COP farms were confirmed to be the most efficient in terms of intermediate consumption. German, French and Estonian COP farms performed lower profit margin values compared to other countries selected for analysis.

As suggested by the results on farm size and economic performance indicators for specialist milk farms, the Estonian farms are leading, while relevant Lithuanian farms show the lowest economic performance concerning production level and productivity. The highest productivity and profitability values are observed for Polish and Estonian specialist milk farms. In Poland, Lithuania, Latvia and Slovenia the profit margin per specialist milk farm exceeds the leading European producers for milk level.

Future research could consider the comparative analysis of the environmental and social farm performance among CEECs. Moreover, future research could be directed towards the comparison between Lithuania's and the New EU Member States farming results including Bulgaria and Romania where small scale farms dominate.

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