

THE ECONOMIC PERFORMANCE OF ORGANIC DAIRY FARMS IN POLAND IN 2014

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Abstract

Organic farming is still a niche agricultural production in Poland. However, for many farmers it can be seen as an attractive alternative, especially in regions with more extensive way of agricultural production. The organic dairy farming may be considered as a one of profitable agricultural production. Based on the survey of Polish FADN system, results obtained in organic dairy farms indicate the economic profitability of the milk production, despite weaker production results compared to conventional dairy farms. Organic dairy farms may be competitive due to lower direct costs incurred on the milk production and significant support by subsidies received.

Key words: organic milk, dairy farm income, extensive production, subsidies

1. INTRODUCTION

Dairy farms in Poland show increasing specialisation and the increasing of the production scale lead to a reduction of the number of dairy farms (Ziętara 2006). In 2013 according to the national statistical data, 356.8 thousand farms were involved in rearing and breeding of dairy cows (in 2010, it was 444.4 thousand). A large part of farms keep small herds of dairy cows – in 2013, about 78% of farms kept less than 10 dairy cows (CSO, 2014). Due to the small population of cows in a herd, and thus a small scale of production, milk production in those farms is often conducted in an extensive manner. Farms conducting extensive production (e.g. organic farms) are less dependent on the purchase of goods and services. They conduct their production mainly based on own resources of the farm, which is justified by lower direct costs of milk production. However, a consequence of this may be limitations in the size of a kept herd of dairy cows as well as weaker production results. In case of farms extensively keeping dairy cattle, the lower milk yields are observed (even by 30% lower than conventional farms with intensive production), however, we should point to the longer period of utility of the cows, which directly translates into lower herd replacement costs (Żukowski, 2009). As an example, the milk yield level of dairy cows in organic farms in Poland (due to multiannual surveys in Agricultural Products Data Collection system AGROKOSZTY conducted in IAFE-NRI) was only 74-81% of the milk yield achieved on average in the dairy farms in Poland (Figure 1).

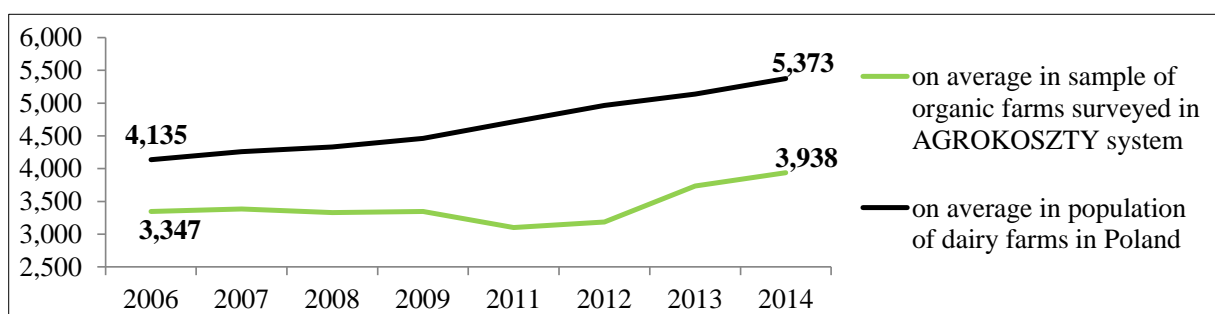


Figure 1. Milk yield (in liters) in organic farms and on average in dairy farms in Poland

Source: own studies based on Agrokoszty system database and Central Statistical Office database

The important factor determining the value production of dairy farms is the selling price of milk. Despite that organic farmers expect a higher farm-gate prices for organically produced milk, in Poland the organic milk selling prices are rather lower than in conventional dairy farms. Due to the survey in

Agrokoszty system, in Poland the farm-gate price of organic milk was 8-16% lower than the price achieved on average in the dairy farms population in Poland (Fig.2).

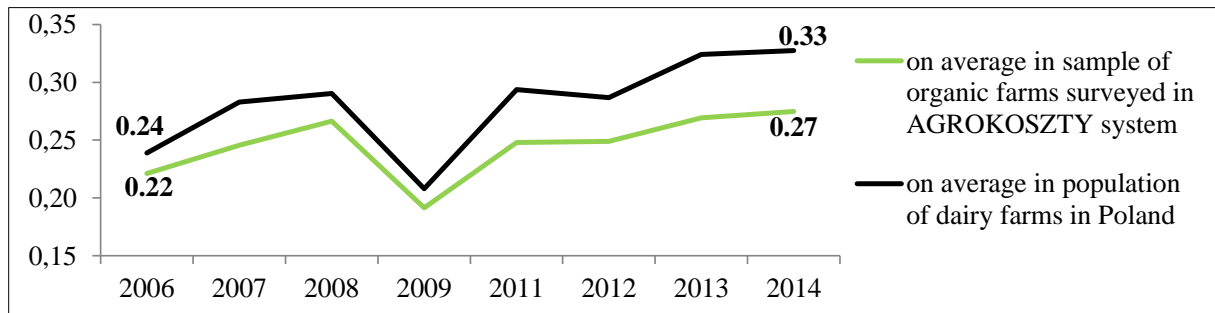


Figure 2. Farm-gate prices (in EUR) for milk in organic farms and on average in dairy farms in Poland

Source: own studies based on Agrokoszty system database and Central Statistical Office database

Organic farms conducting milk production and keeping dairy cows must meet the relevant criteria and standards, mainly regarding the quality of feedstuffs and maintaining appropriate welfare of the animals. Feedstuffs must come from an organic farm, preferably own one, and for this purpose it is necessary to provide a sufficient fodder area. Mostly used are pastures, from which roughage comes (forage, dried fodder or silage). More and more often, attention is paid to the fact that rearing and breeding animals based on permanent grassland is beneficial for both the environment and from the point of view of the production economics (Radkowska, 2012). It is stressed that the profitability of milk production is largely dependent on production of cheap and good quality own feedstuffs. A source of the cheapest feedstuffs, rich in protein and minerals, is permanent grassland (Okularczyk, 2002). Purchased organic feeds are relatively expensive, and their availability in the market is still very limited. In addition, the existing restrictions in animal nutrition in organic farms prohibit the use of industrial concentrated and complete feedstuffs.

In the opinion of the experts, organic milk production may provide an opportunity to improve income for some farms, especially in areas with small industrialisation of agricultural production. In 2014, according to public statistical data, 54.8% organic producers were located in south-eastern Poland i.e. in areas with less intensive nature of agriculture. In those voivodeships, the utilised agricultural area with organic production amounted to 280.3 thousand ha, which accounted for 42.6% of the total area of this agricultural area in Poland (GIJHAR-S, 2015). In 2014, in Poland the structure of the organic utilised agricultural area was characterised by a high share of fodder crops and meadows and pastures. Their total area was 67.3% of the total organic utilised agricultural area. However, it is often indicated that the use of meadows and permanent pastures for fodder purposes in Poland is insufficient, because hay yields are low, and the production capacity of permanent grassland are not fully utilised (Olszewska, 2015).

A key factor for milk producers is the profitability of the production, and an important determinant of the increased profitability of dairy farms is a possibility of reducing the unit costs of production (Mańko, 2007). The article presents the economic situation of organic farms specialised in milk production in Poland in 2014. A comparative analysis of the production results, costs of production and obtained economic effects in relation to the results of conventional farms has been carried out. Also, the major factors differentiating the economic results in conventional and organic dairy farms have been indicated. The main objective was to examine the profitability of milk production in organic farms, as well as to determine the impact of subsidies for operational activities on the obtained economic effects.

2. MATERIALS AND METHODS

Material for the study were the actual accounting data collected in 2014 in conventional and organic farms specialised in milk production. The studies sets of the farms have been divided according to the agricultural type TF8 (based on the applicable typology of farms in the FADN system) and the farms specialised in milk production have been selected (type of farming: specialist dairying). The agricultural type of the farm is determined based on participation of individual agricultural activities in creating of the total Standard Output value of the farm and reflects the system of production. The studies farms came from a sample of the farms keeping agricultural accounting of Polish FADN and they were the market-oriented units and were also stronger economically than average farms in the country.

The results obtained in 2014 in conventional and organic dairy farms have been shown in a tabular form, on average, for the surveyed groups. The studies used a comparative analysis regarding the parameters characteristic of the production potential of the studies groups of the farms i.e. the structure of land resources (utilised agricultural area – UAA), labour resources (expressed by the number of full-time employees in Annual Work Unit – AWU), the total assets and the structure of the total costs of production.

The analysis covered the intensity of livestock production, which is measured by the amount of inputs per unit of production. In the studies, the measure of the intensity of production was:

- total livestock expressed in livestock units – LU (dairy cows = 1 LU) per total UAA
- stocking density of ruminant grazing livestock (in LU) per unit of forage area (i.e., the area occupied for fodder crops, which include the following: fodder roots and brassicas, other fodder plants, temporary grass, meadows and permanent pastures, rough grazing)
- ratio of total livestock output and livestock products to total number of livestock units (LU)
- ratio of livestock specific inputs to total number of LU (i.e. the actual amount of the inputs for the means of livestock production)

The economic condition of the studied groups of farms based on the farm income was evaluated. The categories of the farms income in a form of surpluses, representing payment for production factors in the surveyed farms, have been presented i.e.:

- Farm Net Value Added expressed per annual work unit - AWU, which is payment for involving production factors regardless of the type of ownership,
- Family Farm Income expressed per family work unit - FWU, which is payment for production factors owned by a farming family.

According to the methodology, the units AWU and FWU are equal to 2,120 working hours per year. The income results of the surveyed groups of the farms have been compared to the average annual net salary in the national economy, which was EUR 7,388 in 2014 (exchange ratio 1EUR = 4.1843 PLN). The paper also assessed the dependence of the studied farms of financial support in a form of subsidies to operational activities. This allows to specify the scale of financial supporting the income of organic dairy farm.

3. RESULTS

The total output of both groups of dairy farms was mostly generated by animal production (86-88%) in which the production value of milk and milk products was about 70% of animal production. Total output in surveyed organic dairy farms was lower by 48% and the economic size of surveyed organic dairy farms was lower by 23% in comparison to conventional dairy farms. In surveyed organic farms less dairy cows were kept in the herd – only 11 dairy cows in organic farms compared to 15 dairy cows in conventional farms. But very significant is that in comparison to surveyed conventional dairy

farms the average milk yield in organic farms was lower by 29%. Unfortunately, the milk price was also lower by 7% in comparison with the price of conventional dairy farms.

Table 1. The characteristics of surveyed conventional and organic dairy farms, on average, in 2014

Specification		conventional	organic
Number of surveyed farms		2,735	67
Economic size of farms	[EUR]	7,206	5,508
Total output	[EUR/farm]	35,518	18,304
of this: animal production	[%]	86.0	88.0
Share of the production value of milk and milk products in the total output	[%]	71.0	66.0
Animals in total	[LU]	23.9	16.9
of this: dairy cows	[LU]	15.4	11.3
other cattle	[LU]	8.2	5.4
Milk yield of cows	[kg/cow]	5,281	3,726
Milk price	[EUR/100 kg]	0.28	0.26

Source: own studies based on Farm Accountancy Data Network

The production potential of the surveyed dairy farms were determined by its resources (Table 2). The agricultural land resources were very similar for both groups of dairy farms. But in organic farms more of agricultural land as a forage area was used. Feeding dairy cows in organic farms was mostly based on own resources and the farmers were very limited with purchasing a feed for grazing livestock (only some mineral licks purchased). It should be noted that the total labour input remained at a similar level (1.80-1.82 AWU) in both surveyed groups of dairy farms and mostly (in 98%) it was family labour input.

Table 2. The agricultural land, labour inputs and total assets of surveyed conventional and organic dairy farms, on average, in 2014

Specification		conventional	organic
Utilised agricultural area - UAA	[ha]	21.3	20.9
Share of the forage area in the UAA	[%]	62.0	76.0
Total labour inputs	[AWU]	1.80	1.82
in this: the share of own labour inputs (FWU)	[%]	98.0	98.0
Total assets	[EUR/farm]	217,484	167,161
in this: the share of fixed assets	[%]	90.0	93.0
Machinery (SE455)	[EUR/ha UAA]	1,877	1,379
	[EUR/1 AWU]	22,209	15,837

Source: own studies based on Farm Accountancy Data Network

The value of total assets of surveyed organic dairy farms was significantly lower (by 23%) than in conventional farms – Table 2. But in both surveyed groups the high share of fixed assets was observed (over 90%). The structure of fixed assets was very similar for surveyed conventional and organic dairy farms (Figure 3). Considering the structure of fixed assets, the high share of land was observed (over 50% of total fixed assets). Potentially, we can assume that the higher the land (and breeding livestock) value, the higher possibility of higher livestock output may be expected. An important part of the fixed assets was machinery (including machines, technical equipment and means of transport) as a technical infrastructure of land and labour. The level of mechanisation of the agricultural land (a level of equipping land with machinery, technical equipment and means of transport) was lower in organic farms by 26% than in conventional farms – Table 2. The technical labour productivity (expressed by the value of machinery, equipment and means of transport per AWU) was lower by 28% in organic farms.

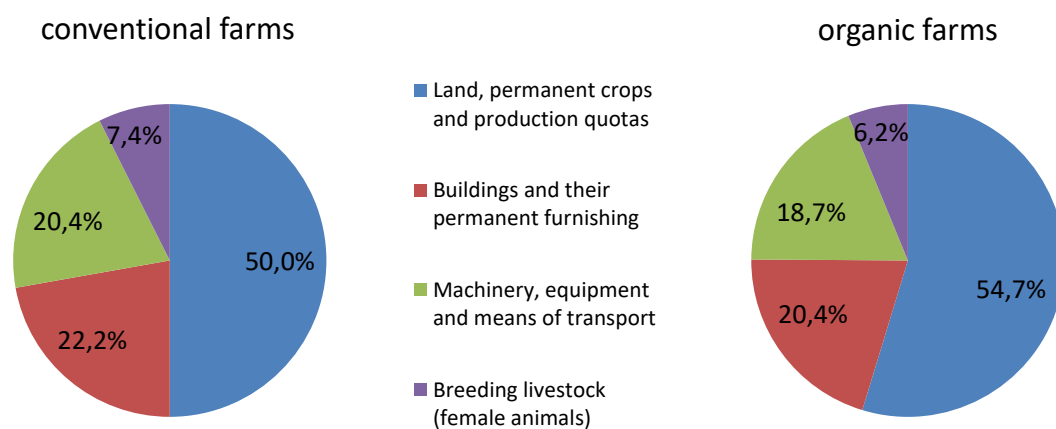


Figure 3. Structure of fixed assets of surveyed conventional and organic dairy farms in 2014

Source: own studies based on Farm Accountancy Data Network

Considering the production and economic results, it can be noticed that the total output in surveyed organic dairy farms was almost 2-times lower than in conventional farms (Table 3). Simultaneously, the amount of the total costs in organic farms was lower by 44.2% mainly due to lower total specific costs. Total specific costs of the livestock production per 1LU in organic dairy farms was 239EUR in comparison to 401EUR in conventional dairy farms. The main reason for the lower level of specific costs was that farmers in organic farms spent 3-times less expenses on the feed for grazing livestock than in conventional farms. Taking into consideration the amount of total output and total input, the relation was more favourable in conventional dairy farms, but not much more than in organic dairy farms – table 3.

Table 3. The total output and total costs of milk production of surveyed conventional and organic dairy farms, on average, in 2014

Specification		conventional farms	organic farms
Total output	[EUR/farm]	35,518	18,304
Total costs	[EUR/farm]	27,220	15,193
of this: Total specific costs	[EUR/farm]	13,775	5,107
Total farming overheads	[EUR/farm]	6,586	4,737
Depreciation	[EUR/farm]	5,775	4,456
Total external factors	[EUR/farm]	1,084	893
Total output / Total input		1.30	1.20

Source: own studies based on Farm Accountancy Data Network

The livestock production intensity indicators of surveyed conventional and organic dairy farms was shown on Table 4. The livestock production intensity may be identified by number of total livestock (in LU) on 1 ha of the utilised agricultural area (UAA). It also provided the information on the level of agricultural management intensity and indicated the scale of the environmental burden of natural fertilizers (manure). The stocking density indicator allowed to measure the productivity of forage area (agricultural land providing feedingstuff for ruminant grazing livestock). In surveyed organic farms per 1 ha of the forage area there were only 1.02 LU, when in conventional farms it was 1.78 LU. When analysing the animal production intensity, the total livestock output and specific livestock costs calculated per number of animals was taken into account. The results confirmed lower level of the output (by 25.4%) and the costs (by 40.4%) in organic farms – table 4.

Table 4. Livestock production intensity of surveyed conventional and organic dairy farms, on average, in 2014

Specification		conventional	organic
Total livestock unit per total UAA	[LU/ha]	1.13	0.81
Stocking density of forage area	[LU/ha]	1.78	1.02
Total livestock output per LU	[EUR/LU]	1,266	945
Specific livestock costs per LU	[EUR/LU]	401	239

Source: own studies based on Farm Accountancy Data Network

The level of surveyed dairy farms income was affected by the subsidies. The share of the total subsidies in family farm income in organic dairy farms was about 75% and in conventional farms – only 42%. The family farm income in surveyed conventional dairy farms was less dependent to the subsidies and the production was considered to be more competitive than in organic dairy farms.

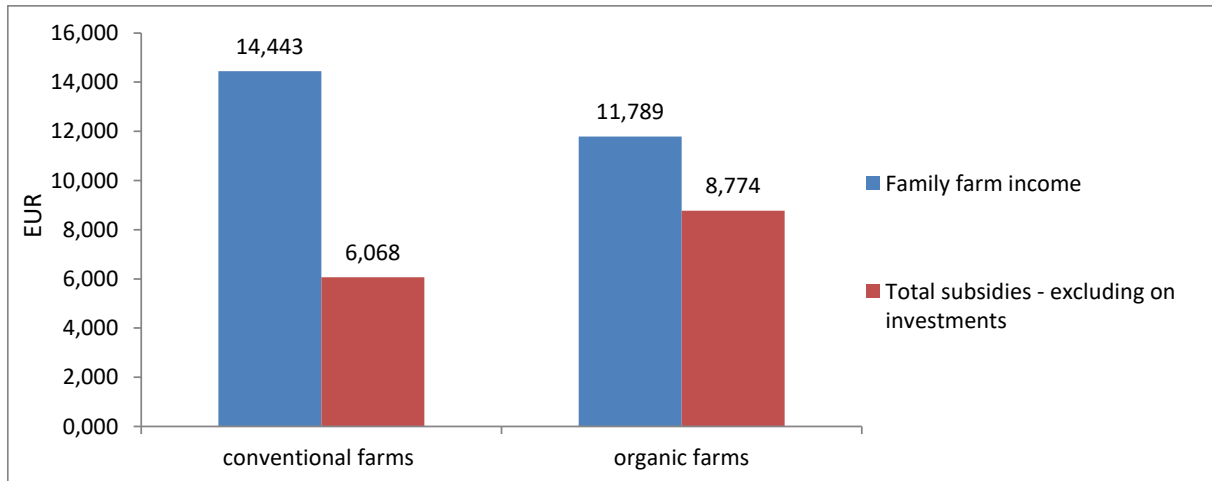


Figure 4. Total subsidies and family farm income in surveyed conventional and organic dairy farms in 2014

Source: own studies based on Farm Accountancy Data Network

The income results per person of the surveyed groups of the farms have been compared to the average annual net salary in the national economy. The organic farmers of surveyed farms could not be satisfied with the results. The family farm income of the organic dairy farms could cover the payment for involving work of the farmer and farmer’s family only in 89.8%. In case of conventional dairy farms the income per person was higher by 11.3% than average annual net salary in national economy.

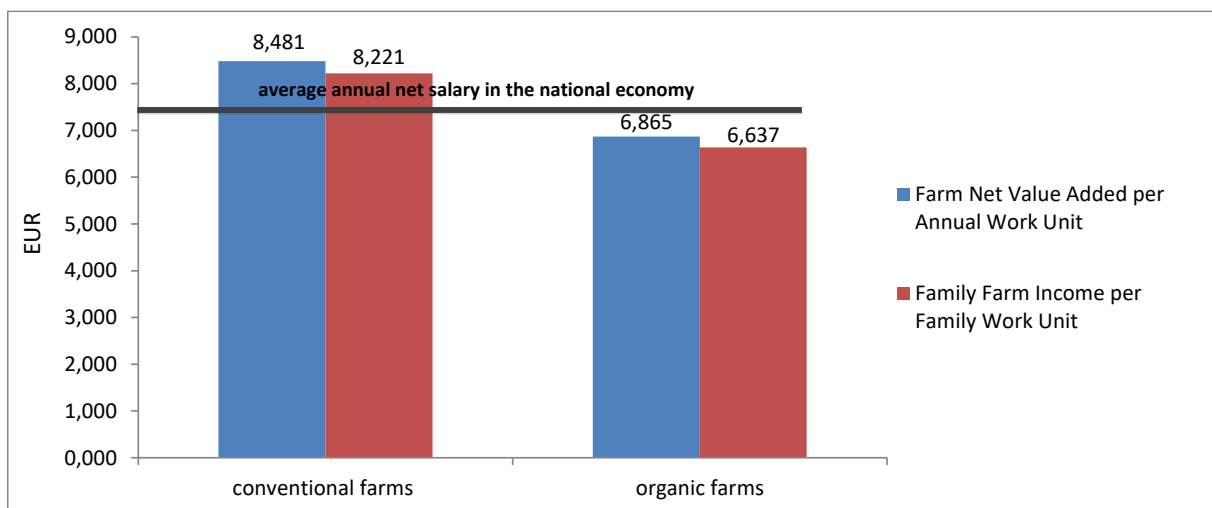


Figure 5. The income results per person in surveyed conventional and organic dairy farms in 2014

Source: own studies based on Farm Accountancy Data Network

4. SUMMARY

It is very important that due to low number of surveyed organic dairy farms the results obtained were not representative for national average results for the organic dairy farms. These are only average results for the surveyed sample of farms. However, the calculations carried out provide a reliable picture of the economic situation in organic dairy farms in Poland.

Based on the analyses carried out in a surveyed groups of organic and conventional dairy farms, some conclusions can be drawn, as follows:

- The surveyed organic farms were conducting the extensive production mainly based on their own resources. The resources of the utilised agricultural area of surveyed organic farms (20.9ha on average) was only about 2% smaller than in conventional but the share of the forage area involved in feeding of organic dairy cow was bigger.
- The average herd size of cows kept in organic farms was 11 dairy cows compared to 15 dairy cows in conventional farms. In both surveyed groups of farms the milk production may be considered as a small scale of milk production (in terms of herd size) and very close to the average size of cows herd in dairy farms in Poland.
- It is assumed that the stocking density (as the indicator of the productivity of forage area) may be lower in organic farms (1.02 LU per 1ha of forage area) than in conventional farms (1.78 LU per 1ha of forage area) not only because of environmental issues but mostly due to limited possibilities of own feedingstuff production for livestock. It must be emphasize that the higher intensity of feedingstuff production may cause the higher risk of environmental threats.
- The labour inputs in both groups of surveyed farms was very similar (1.8 AWU) and mostly (in 98%) the work of the farmer and farmer's family was engaged in keeping livestock.
- The production potential of the surveyed organic dairy farms were determined also by the value of total assets and it was significantly lower (by 23%) than in conventional farms. But in both surveyed groups the high share of fixed assets was observed (over 90%). It is considered that high costs of fixed assets may be the limitation for the efficient use of own resources and for the adjusting to changing market conditions.
- Considering the production results in comparison to conventional farms, in surveyed group of organic farms a lower milk yield (by 29%) and a less favourable milk price (lower by 7%) was observed. Therefore the total output of organic farms was lower by 48% than in conventional farms. Very characteristic for organic farms was the lower total costs of production (by 44.2%) mainly due to lower total specific costs associated with lower costs of feedingstuffs for livestock.
- The share of the amount of subsidies in family farm income in the case of organic farms was relatively high (75%), which makes organic milk production more dependent on the financial support than in conventional dairy farms (the share was only 42%).
- The higher income per person (FWU and AWU) was achieved by conventional dairy farms. In comparison to the average annual net salary in the national economy, only in the conventional farms the costs of farmer's and his family work could be fully covered, while in organic farms only in 89.8%.

Organic livestock production seems to be a big challenge for the farmers, because it is a kind of agricultural production for a very specific market with high expectations of consumers and high requirements from the agricultural production methods. Despite all benefits of organic agriculture for the livestock and the environment, it seems that without social approval and financial support the organic livestock production could be less and less popular amongst the farmers. When considering only the economic results that may be not enough convincing for taking activity in organic milk production.

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