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SHEEP PRODUCTION AS AN ELEMENT OF SUSTAINABLE DEVELOPMENT OF RURAL AREAS

PRODUKCJA OWCZARSKA JAKO ELEMENT ZRÓWNOWAŻONEGO ROZWOJU OBSZARÓW WIEJSKICH

Key words: sustainable development, sheep production, rural areas

Słowa kluczowe: rozwój zrównoważony, produkcja owczarska, obszary wiejskie

Abstract. The aim of this study was to evaluate individual farms which predominantly dealt with crop production, but also kept sheep. Information about the farms' cash flow was collected by way of direct interviews with the owners of the farms. The cash flow analysis revealed problems with liquidity. Therefore, it was necessary for some farms to have financial resources available for periods of negative financial flows or to be able to sell farm products. The national sheep industry which focuses on the production of lambs for slaughter, gives the opportunity to improve revenue. This was especially necessary in the second quarter, in which a lack of liquidity was observed. The share of income from sheep production in total revenues ranged from 19 to 50%, and proved that keeping sheep as a supplementary activity was beneficial.

Introduction

Sustainable development of rural areas embraces economic, social and ecological issues [Michalska 2007]. Some authors highlight its additional ethical and moral aspect [Baum 2003]. This development is intricately linked with multi-functionality which involves creating environmentally sustainable conditions for various agricultural activities. Moreover, it is essential to provide the rural population with adequate living conditions [Strategia 2005, Wilk 2007]. The principle of sustainable development has become a primary indicator of Poland's development, obligatory not only in agriculture but in all economic domains as well as in those anthropogenic activities which we commonly face [Adamowicz 2005, Kostuch 2011]. In 2013, rural areas and those naturally valuable in Poland accounted for 94.4% of land area; hence they had a considerable impact on the state of the environment [Statistical Yearbook 2013]. The elements of rural landscape include: arable land [in that permanent grasslands], forests, lakes, fallow land and rural communities as well as animals as an equally important landscape component [Faber 2001]. The implementation of sustainable development principles requires compliance with agro-technical dates, the utilization of organic fertilizers, the appropriate application of plant protection means. Besides, sustainable development in agriculture puts stress on ensuring an adequate standard of living conditions for rural society, the maintenance of esthetic and recreational potential of agricultural areas as well as the promotion of good human health and animal well-being [Baum 2008, Runowski 2000]. All these requirements can be fully met in farms with livestock and crop production [Duer et al. 2004].

Sheep farming can indubitably meet these needs and expectations. Sheep as a species fit well into the rural landscape, while as undemanding animals on a daily care basis, enable farmers to have additional off-farm work. In a number of Western European countries, sheep are used as alternative production for landscape architecture and environmental conservation. Recently, sheep grazing on wasteland, fallow land or National Park buffer zones has gained in popularity [Niznikowski 2005, Rokicki 2007].

Material and methods

The primary material for the present research was collected on the basis of empirical studies conducted in 25 family farms producing sheep located within two counties of Lublin Province (Chełm and Lublin). A structured interview technique was used to collect information from the sheep owners about their farms' resources, whereas agricultural calendars served as the basis for determining financial flows. From 1st January until 31st December 2012, the farm owners ran and kept financial records of their payments and payouts. After the verification of results, 6 sheep farms were excluded because of incomplete documentation. As a consequence, complete data were obtained from 76% of the surveyed subjects. On the basis of the performed research, a picture of a "standard" average sheep farm characterized by definite features was established. The data were presented using descriptive, tabular methods as well as financial flow statements.

Results

The total land area (used by the polled farm owners) amounts to approximately 546 ha, including arable land, forests, wasteland and ponds. Among the studied farms, those of 10-20 ha area (55%) prevailed, the smaller (under 10 ha) accounted for 18%, whereas those of over 20ha area made up of 27%. A standard (medium) farm had 14.05 ha of its own farmland (10.84 ha arable land, 4.49 ha permanent grassland, 0.75 ha agricultural land) and 7.03 ha tenant land.

Land tenancy agreements that enabled the expansion of farm size were used by 80% of the studied subjects. The land area structure was dominated by arable land that accounted for a total of 70.4%. Meadows occupied a substantial part of area (ca. 121 ha), with nearly 40% of area under agricultural lease. A part of the polled farmers had pastures of around 19 ha that were in almost 90% of cases owned by them.

The average number of people who were self-employed (on farms) was 2.34, (most commonly 2 people). Most farmers (ca. 80%) had investment plans for the near future, e.g. purchase of land, tractor or running repairs. Five farm households had off-farm income, namely in three farms it was off-farm employment, while in two – pension and retirement pay. Most farms (80%) claimed to rely solely on farming the land.

Land value reported by farmers averaged PLN/ha 13 900, while the price in farms oscillated from PLN/ha 6 000 up to 30 000. The soil quality index (SQI) in the farms was 0.99, which means that those

are medium quality soils, with a predominant IVa soil quality class. The SQI evaluating the farmland under study ranged between 0.4 (V and VI class) and 1.36 (III class).

The farms possessed great capital assets, i.e. residential and farm buildings, machinery and agricultural tools. The average age of residential buildings was estimated at 40 years. The animal housing facilities were often multifunctional, used for animal breeding for 40 years. In some farms, the state of these buildings raised some doubts about the conditions ensuring proper animal housing and management. Each farm was reported to have buildings and auxiliary facilities (barn, shelters, and garages). As other farm buildings, the barns were of about the same age, whereas shelters or garages were constructed much later (at present they are about 20 years

Table 1. Arable land structure

Tabela 1. Struktura użytków rolnych

Agricultural land/ <i>Użytki rolne</i>	Area/ <i>Powierzchnia</i> [ha]	%
Arable land/ <i>Grunty orne</i>	384.69	70.4
– owned/ <i>własne</i>	260.11	67.6
– under a lease/ <i>dzierżawione</i>	124.58	32.4
Meadows/ <i>Łąki</i>	120.97	22.2
– owned/ <i>własne</i>	73.85	61.0
– under a lease/ <i>dzierżawione</i>	47.12	39.0
Pastures/ <i>Pastwiska</i>	18.84	3.4
– owned/ <i>własne</i>	16.84	89.4
– under a lease/ <i>dzierżawione</i>	2.0	10.6
Orchards/ <i>Sady</i>	8.53	1.6
Ponds/ <i>Stawy</i>	0.3	0.1
Forests/ <i>Lasy</i>	12.56	2.3

Source: own study

Źródło: opracowanie własne

old). The average replacement value of buildings, excluding residential ones, was PLN 295 000 and was found within the PLN 98 000-565 000 range. A farm machinery stock in agricultural production is of primary importance for farm wealth.

Each farm with agricultural business activities possessed 1.8 tractors (on average) which were 26 years old. It was found that 27% of the studied subjects had 2 tractors additionally equipped with trailers (on average 2 units per farm) and passenger cars (Tab. 2).

The research performed demonstrated that agricultural machinery and implements owned by the farmers still fulfill their function despite their relatively long life exploitation. That gives evidence that the equipment is well taken care of by the owners.

The farms possessed basic machinery for soil cultivation and fertilization as well as for sowing, planting and the care of plants. Their average value was PLN 66 000 (from 21 000 up to PLN 307 000).

The inclusion of a farm holding to the pool of surveyed subjects depended primarily on sheep maintenance. A minimum size of basic herd was determined to be 30 mother sheep.

The average size of a mother sheep herd was 46 units and the average value of basic herd estimated by farmers was PLN 12 566 (from PLN 3200 up to 31 000). The studied sheep enterprises were oriented toward slaughter lamb sale. Lambs were raised with dams under the indoor-pasture system with full use of grasslands (meadows, pastures). A feeding strategy of all the experimental groups in each farm was based on on-farm grown forage, hence plant production was directly associated with the needs and specificity of this species. About 8% of arable land area was devoted to meet sheep feed requirements.

The cropping pattern in a standard medium farm holding was dominated by cereals (77%) followed by root crops (9.4%), grasses (6.8%), forage crops (1.5%) and other crops (5.3%). A high percentage of cereals makes it difficult to establish a right combination of crops within the rotation cycle which can result in decreased crop yields.

The average financial inflow from direct payments to agricultural land in the sheep enterprises reached PLN 14 700 (from PLN 4000 up to 45 400). The inflows from other direct subsidies came from payments on animals, LFA, sugar payments, agri-environmental and to soft fruit payments. The average estimated inflows from all the direct subsidies were PLN 20 000 per farm (PLN 5000-60 000).

Table 2. Means of transportation
Tabela 2. Środki transportu

Transportation means/ <i>Środek transportu</i>	Number of means/ <i>Liczba środków</i>	Average age [years]/ <i>Średni wiek [lata]</i>
Tractors/ <i>Ciągniki</i>	46	26
Trailers/ <i>Przyczepy</i>	51	29
Passenger cars/ <i>Samochody osobowe</i>	31	14

Source: own study

Źródło: opracowanie własne

Table 3. Agricultural machinery and tools used for soil cultivation (unit)

Tabela 3. Maszyny i narzędzia rolnicze do uprawy roli (sztuki)

Farm machinery/ <i>Sprzęt</i>	Number/ <i>Liczba</i>	Average age [years]/ <i>Średni wiek [lata]</i>
Plough/ <i>Plug</i>	36	24
Harrow/ <i>Brony</i>	32	19
Disc Harrow/ <i>Brona talerzowa</i>	6	18
Cultivating aggregate/ <i>Agregat uprawowy</i>	13	4
Cultivator/ <i>Kultywator</i>	24	26
Rotary tiller/ <i>Glebogryzarka</i>	3	20

Source: own study

Źródło: opracowanie własne

Table 4. Number of sheep managed in the surveyed farms

Tabela 4. Liczba owiec utrzymywanych w ankietowanych gospodarstwach

Item/ <i>Wyszczególnienie</i>	Number of animals/ <i>Liczba zwierząt</i>
Mothers/ <i>Matki</i>	1150
Ewe lambs/ <i>Jarki</i>	140
Ram lambs/ <i>Tryczki</i>	18
Lambs/ <i>Jagnięta</i>	141
Gregarious Rams/ <i>Tryki stadne</i>	38
Total/ <i>Ogółem</i>	1487

Source: own study

Źródło: opracowanie własne

Only eight sheep farms took long term credits of an average value of PLN 60 000, while seven sheep enterprises had short term ones – PLN 18 300. Many farms face the challenge of uneven distribution of financial flows. The results pertain to 17 sheep farms where the payments and payouts were consistently recorded throughout the year 2012. During this year, the financial resources in a ‘standard’ medium farm increased (Tab. 5). In the operational activity (basic for the farms engaged in agricultural production), the cash outflows exceeded the inflows only in the 2nd quarter. As for investment activity, negative financial flows were associated with e.g. a purchase of machinery or land. In financial activities, positive flows resulted from the receipt of financial resources from a bank (credit). A debit balance in a year quarter meant the repayment of credit installments. Private activities undertaken by farmers were aimed at supporting the household and family. The financial inflows came from, e.g. farmer off-farm work or retirement pay and pension benefits. The problems with financial liquidity in a standard sheep enterprise occurred in the 2nd quarter. As a rule, the expenditure had to be incurred on purchases of sowing material, fertilizers, crop protection chemicals. The best financial situation was reported in the 1st quarter when the farmers were granted direct subsidies for farmland.

Table 5. Financial flows in a “standard” sheep farm in 2012 [PLN]

Tabela 5. Przepływy pieniężne w „typowym” gospodarstwie owczarskim w 2012 r. [zł]

Activity type/ <i>Rodzaj działalności</i>	Initial state/ <i>Stan</i> <i>początkowy</i>	Balance/ <i>Saldo</i>				
		I qrt/ <i>I kw.</i>	II qrt/ <i>II kw.</i>	III qrt/ <i>III kw.</i>	IV qrt/ <i>IV kw.</i>	total/ <i>razem</i>
Operating activity/ <i>Działalność operacyjna</i>	-	14 482.45	-161.55	5 865.00	6 739.55	26 925.45
Investing activity/ <i>Działalność inwestycyjna</i>	-	-327.27	-945.45	-609.09	0.00	-1 881.82
Financial activity/ <i>Działalność finansowa</i>	-	-3 489.36	1 748.64	-270.91	-43.64	-2 055.27
Private activity/ <i>Działalność prywatna</i>	-	-2 867.00	-1 448.09	-1 794.82	-3 514.73	-9 624.64
Vault Cash/ <i>Gotówka w kasie</i>	8 963.64	7 798.82	-806.45	3 190.18	3 181.18	22 327.36

Source: own study

Źródło: opracowanie własne

One of the ways of ensuring farm financial liquidity is farm household diversification in agricultural activities, often into non-agricultural ones. The surveys did not indicate any prevailing activity. The farmers received payments upon sale of sugar beets, commercial cereals, seed grass, potatoes, currants, raspberries, cherries, apples, vegetable, cucumbers, cauliflowers, strawberries and garlic. Revenue also came from farm machinery services, direct payment, sugar dividends, agri-environmental payment, payment for lamb weighing, salaries, for fruit picking, retirement pays and compensation for damages caused by wild boars. The objective of all these activities was to counterbalance agricultural activity in order to make the best use of the possessed resources as well as secure cash inflow during the most critical seasons. Sheep production proved to be the dominating farming activity in only 2 out of 17 studied farms. It was proven that over 50% of revenue earned from this production constituted the total revenue of a farm. In the other sheep farms, sheep rearing and breeding were one of many different agricultural practices and the revenue it generated accounted for several per cent. The presented results explicitly indicate that sheep production can be considered a major or complementary farm activity.

Conclusions

The obtained research results and the analysis performed allowed to state that most of the studied sheep enterprises possessed adequate resources for sheep production. The financial flows in the farms indicate their illiquidity in the second quarter of the year. With the aim of sorting out this problem, diverse agricultural activities should be conducted on a farm to ensure revenue in difficult periods. Sheep farming can be seen as one of these alternatives. Farms with grasslands can successfully meet the requirements of sheep production. Animal grazing is the most natural and cost-effective way of providing good quality forage as well as a tool to maintain high landscape values of rural areas. While on a farm, sheep can be fed crop by-products or plant waste which is a major benefit. It seems that sheep production as a complementary agricultural activity contributes to the use of land resources and thus, to the harmonious realization of sustainable agriculture assumptions in the productive, economic, ecological and social dimension.

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Streszczenie

W pracy przedstawiono zasoby oraz przepływy pieniężne gospodarstw indywidualnych, w których oprócz wiodącej produkcji roślinnej utrzymywano owce. Dane dotyczą 2012 roku i gospodarstw z województwa lubelskiego. Informacje o rachunku przepływów pieniężnych zebrano na podstawie wywiadu bezpośredniego z właścicielami gospodarstw. Analiza przepływów pieniężnych wskazała na problemy z zachowaniem płynności finansowej. Konieczne jest, zatem posiadanie pewnych zasobów pieniężnych przewidzianych na okresy ujemnych przychodów finansowych lub możliwość sprzedaży produkcji z gospodarstwa. Krajowe owczarstwo ukierunkowane na produkcję jagniąt rzeźnych daje możliwość poprawy przychodów szczególnie w drugim kwartale, w którym odnotowuje się brak płynności finansowej. Udział przychodów z produkcji owczarskiej w przychodach całkowitych wynosił od 19 do 50%, i był dowodem na korzyści płynące z utrzymywania owiec, jako działalności uzupełniającej.

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