

ANALYSIS OF PROFITABILITY OF CHINCHILLA FARMING BASED ON THE PRODUCTION RESULTS OF A SELECTED FARM

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Abstract. The aim of the study was to analyse the cost-effectiveness of chinchilla breeding in Poland on the basis of the production analysis of a selected chinchilla farm located in the Mazowieckie voivodship, Poland. The analysis covered a period of two years and involved a total of 250 Standard and Black Velvet chinchillas. The following traits were studied: litter size at birth and litter size at weaning. Economic analysis involved the turnover and costs of the farm. We applied the system of cost estimation in which all costs are broken down into direct and indirect costs. Cost-effectiveness of the farm was evaluated based on economic indices and reproduction performance of the animals. The costs of feeds and salaries were those most strongly affecting the total cost of farming, although reproductive performance of the chinchillas also significantly influenced the profitability of the farm. The production of the studied chinchilla farm was profitable, as evidenced by the profitability index, which in 2011 amounted to 127.27% and increased the following year to the level of 143.13%. Showing an upward trend, the rate of return (27.27% in 2011 and 43.13% in 2012) may indicate a progress in the efficiency of the activity of the studied farm.

Key words: chinchilla, cost, pelt, price, profitability, revenue

INTRODUCTION

The ever fashionable chinchilla fur is highly valued all over the world, and the demand is showing a growing tendency from year to year. It should be kept in mind that the fur pelt market is probably the most unstable market in terms of

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prices among all other markets of agricultural products, and the demand for pelts is strongly driven by extremely variable fashion trends [Paluch and Kuźniewicz 1993, Socha and Szumska 2002].

The global production of chinchilla pelts is estimated at a level of more than 250 thousand. What advocates the farming of these animals is the economic aspect: low costs of the facility, ease of handling, effectiveness of feed use, quite high prolificacy and a number of weaned offspring, as well as a short production cycle underlying a quick return on the investment [Socha and Szumska 2002].

In the early period of chinchilla breeding, only the Standard variety was popular. Improvement work aimed at darker colors of the fur (on the back and sides, with the belly remaining white) resulted in the dark types of Standard and, finally, the Black Velvet. These two varieties account for over 85% of the entire population of farmed chinchillas [Bielec 2010]. Black Velvets are considered very valuable, both in terms of fur and breeding. In practice, Black Velvet males are most commonly mated to Standard females. This allows obtaining many interesting in terms of fur hybrids [Jarosz and Rżewska 1996].

Economic outcomes of chinchilla breeding depend primarily on the number of weaned offspring and the quality of their pelts [Sulik et al. 2001]. Pelt prices fluctuate depending on supply, demand, fashion trends, health status of the animals, competition strength, climate, condition of the global economy, and the demand for pelts in a given season.

The aim of this study was to analyze the profitability of chinchilla breeding based on the production results of a selected chinchilla farm over two years' period.

MATERIAL AND METHODS

Data constituting the material for the study was obtained from a chinchilla breeding farm located in the Mazowieckie voivodship, Poland. Animals were kept in the cage system and fed pelleted feed in accordance with current nutritional recommendations [Gugołek 2011]. Cages were equipped with automatic drinkers, which ensured that the animals had a constant access to fresh water. The breeding was carried out in polygamous sets with 4:1 ratio of females to males. The analysis covered a period of two years, and a total of 250 animals, 50 males and 200 females, were evaluated. The studied chinchillas belonged to the varieties Standard and Black Velvet.

The reproduction performance evaluation was based on the number of born and weaned offspring. The value of end production was presented as sales value of the marketed pelts. The basic economic indices estimated in the study are as follows:

$$\text{Index of production profitability} = \frac{\text{income}}{\text{total costs}} \times 100\%$$

$$\text{Return on sales index} = \frac{\text{income}}{\text{sales revenue}} \times 100\%$$

$$\text{Index of production efficiency} = \frac{\text{sales revenue}}{\text{total costs}} \times 100\%$$

The index of production efficiency shows whether the production was profitable (above 100%) or not (below 100%). Index of production efficiency in agriculture is a measure of production efficiency, expressing the degree in which the sales value of the production covers the costs of the production [Juszczyk 2007], or indicating what percentage of the price covers the costs [Fereniec 1997].

RESULTS AND DISCUSSION

The analyzed chinchilla farm was monitored for the number of young born and weaned over the period of two years. These data were necessary for estimating the income gained from the breeding. In 2011, 444 kits were weaned from 200 females of the breeding stock, and 558 kits in 2012 (Table 1). The average annual fecundity of a female was 2.22 kits, in 2011, and 2.79 kits, in 2012. According to a study Sulik and Barabasz [1995] carried out on Polish farms, fecundity of females was 2–2.50 kits per female per year. The highest average number of young born and weaned was attained by females aged 2–4 years, irrespective of the color variety [Romanek 2002]. The smallest litters are obtained from either the youngest and oldest females, and in primiparous females fertility is reduced by approximately 20% [Gromadzka-Ostrowska 1998].

Profit or loss, expressed as the difference between the revenue from the sale of the product (in the analyzed farm this was the sale of chinchilla pelts) and the costs of goods sold [Grużewska 2007], is a measure of the profitability of each type of production. Control of the expenditures and costs is a very important element in assessing the business and as one of the functions usually occurs at the end of the management process, although it is also the starting point for the subsequent stages of management [Kondraszuk 2009]. The costs of every business entity are one of the basic economic categories, against which its proper operation can be verified. Each economic operator should periodically analyze its costs to allow adaptation to the ever changing market [Paszula 2007]. Hence, if we strive to the highest profitability of production, it is in the area of costs where opportunities for improvement should be sought. An ongoing costs and cost effectiveness analysis and adjustment of production technology to changing economic conditions

Table 1. The size of the breeding stock and the number of offspring

Tabela 1. Liczebność stada podstawowego i potomstwa

Year of production Rok produkcji	Group of animals Grupa zwierząt	Herd size Liczebność stada	Number of offspring Liczba młodych
2011	Females of the breeding stock Samice stada podstawowego	200	
	Males of the breeding stock Samce stada podstawowego	50	
	Offspring Młodzież	0	444
2012	Females of the breeding stock Samice stada podstawowego	200	
	Males of the breeding stock Samce stada podstawowego	50	
	Offspring Młodzież	0	558

is essential to ensure the highest agricultural profit and profitability of production [Banaś 2009]. The size and intensity of animal production on the farm is determined by the cost-effectiveness, and thus the highest agricultural profit [Konopka 2011].

Direct and indirect costs together represent the total cost of production [Fereniec 1997, after Konopka 2011]. Direct costs are as follows:

- feeding (pellets, hay),
- feed supplements,
- bath dust,
- pelt tanning,
- veterinary care,
- own labor.

Indirect costs include:

- power,
- fuel,
- telephone calls,
- agricultural activity related fees, taxes, insurance,
- other costs.

Each group of costs is strongly influenced by the functioning of the farm. The main factors shaping this cost structure are: the output volume, reproductive performance of the animals, farm management system, the degree of mechanization of the farm, animal health, source and way of acquisition of certain means of production, and professional expertise of the farm operator [Konopka 2011].

The analysis of indirect costs revealed that during the studied period there was an increase in the share of electricity costs, from 9.7% in 2011 to 12.9% in 2012, and an increase in the share of heating costs, from 10.3 to 14.9%, in respective years (Table 2). A large proportion of the indirect costs belong to other costs, which include the Agricultural Social Insurance Fund (KRUS) fees, fuel (business trips, training, transport of animals for pelt tanning), telephone charges, veterinary services and other animal husbandry-related costs.

The indirect costs of the analyzed farm tend to increase, which is a result of an increase in the market prices of services.

Table 2. Indirect costs

Tabela 2. Koszty pośrednie

Indirect costs Koszty pośrednie	2011	2011	2012	2012
	Value, PLN Wartość, zł	Share, % Udział, %	Value, PLN Wartość, zł	Share, % Udział, %
Heating Ogrzewanie	800	10.3	928	14.9
Electricity Energia elektryczna	755	9.7	805	12.9
Other costs Inne koszty	4350	55.8	4505	72.2
Total Razem	5905	75.7	6238	100.0

We also analysed the farm revenue structure. The main source of receipts was the sale of pelts, as illustrated in Table 3.

Table 3. Number and value (PLN) of chinchilla pelts sold each year

Tabela 3. Liczba (w sztukach) i wartość (w złotych) sprzedanych skór szynszyl w poszczególnych latach

Specification Wyszczególnienie	Year Rok kalendarzowy		Total Łącznie
	2011	2012	
The number of sold pelts, pcs. Liczba sprzedanych skór, szt.	444	558	1002
Sales value of the pelt, PLN Wartość sprzedanych skór, zł	51 060	64 170	115 230
Average sold pelt price, PLN Średnia cena sprzedanej skóry, zł	115	115	115

The average price of a sold pelt in the analyzed farm was PLN 115. In terms of price, pelts of fur-bearing animals are the most unstable market items amongst agricultural products [Konopka 2011]. The breeder will never be able to control all the factors that affect the final price of the pelt; however, knowledge on some of

them (the supply of specific quality grades, the requirements of the customers) can significantly improve the economic condition of farms [Paluch and Kuźniewicz 1995].

The cost calculation of the chinchilla farm are shown in Table 4, which shows that the largest percentage in the total costs are represented by feeds – the basic element of the direct costs. In 2011, this share was 31.2%, and in 2012 – 34.3% (Table 4). The higher percentage in the second year of the study was due to a higher number of offspring born in 2012 and due to higher prices of pellets. Similar results were obtained by Paluch and Kuźniewicz [1996] – feed costs accounted for 27.9–34.5% in the structure of the total costs.

A large part in the total costs were salaries for the own labor. Remuneration was calculated as a quarter of the national average gross salary, which was PLN 3573.27 in 2011; this gives PLN 893.32 or PLN 10,719.84 per month and per year, respectively. In 2012, the national average gross salary was PLN 3641.00, so the quarter of this was PLN 910.25 per month and PLN 10,923.00 per annum. Salaries accounted for 26.7% of the total cost in 2011 and 24.4% in 2012 (Table 4).

Also the cost of pelt tanning (PLN 15 per pelt), which is accounted as a direct cost, was a significant item in the calculation, as it represented about 20% of direct costs in the analysed years, as well as 16.5 and 18.1% of the total costs in 2011 and 2012, respectively (Table 4).

Another component of the costs that are directly related with the production volume was the bathing dust, an important element of husbandry, having a direct impact on the quality of the fur, and, finally, on the price of the pelt. The expenses incurred for the dust hovered around 2.2 and 2.1% of the direct costs in 2011 and 2012, respectively (Table 4).

The height of indirect costs does not depend directly on the volume of production [Matuszewicz 2009]. They are incurred for the operation or the existence of the farm.

The aim of a commercial chinchilla farm is the economic profit. A number of factors may influence the profitability of the cycle, some can be controlled by the breeder, others are beyond that control. Previous include the level of investment, costs, and the resulting output volume [Gołębiewska 2005]. The end value of the output was composed from sales revenues of the pelts. Sales revenue reduced by total costs is the direct surplus, which in the analysed farm was PLN 30 275.00, whereas the unit profit per pelt reached on average PLN 30.21 (Table 5).

The profitability of agricultural businesses is shaped by different groups of factors that directly or indirectly affect the level of production and income [Kołoszko-Chomentowska 2007]. Considering the profitability of production, which is the percentage ratio of income to the value of production [Fereniec 1999, Kałuża

Table 4. Estimation of costs and their percentage structure in the analysed farm in each year

Tabela 4. Oszacowanie kosztów oraz ich struktura procentowa w analizowanej fermie w zależności od roku kalendarzowego

Cost specification Wyszczególnienie kosztów	Year Rok kalendarzowy			
	2011 value, PLN wartość, zł	2011 share, % udział, %	2012 value, PLN wartość, zł	2012 share, % udział, %
Own labor (¼ of national average salary) Praca własna (¼ etatu średniej krajowej)	10 720	26.7	10 923	24.4
Feeds Pasze	12 500	31.2	15 373	34.3
Hay (own production) Siano (produkcja własna)	800	2.0	658	1.5
Vitamins, herbs Witaminy, zioła	486	1.2	490	1.1
Veterinary care Uslugi weterynaryjne	1 200	3.0	1 000	2.2
Antifungals "Fungi" (0.5 kg package) Środki przeciwgrzybicze „Fungi” (op. = 0,5 kg)	355	0.9	402	0.9
Disinfectants "Werol" (0.2 l bottle) Środki dezynfekcyjne „Werol” (butelka = 0,2 l)	380	0.9	400	0.9
Bathing dust (20 kg package) Pył kapielowaty (op. = 20 kg)	760	1.9	820	1.8
Tanning costs (PLN 15 per pelt) Koszt wyprawy skóry (15 zł za szt.)	6 630	16.5	8 100	18.1
Wood shavings Wiórki	385	1.0	430	1.0
Heating Ogrzewanie	800	2.0	928	2.1
Electricity Energia elektryczna	755	1.9	805	1.8
Other costs Inne koszty	4 350	10.8	4 505	10.0
Total costs Koszty łączne	40 121	100.0	44 834	100.0
Unit cost of production per pelt, PLN Koszt wyprodukowania 1 skóry, zł		90.36		80.35

et al. 2005], it may be stated that it was positive in the studied farm. It ranged between 21.42%, in 2011, and 30.13%, in 2012, which shows an upward trend (Table 6).

The issue of profitability of livestock production involves such decisions as choice of the appropriate method of production and the optimal size of the herd. The size of the farm is associated with the costs of its activity, both in terms of the level and structure. The cost is the foundation of profitability in livestock

Table 5. Economic outcomes in the analysed chinchilla farm

Tabela 5. Wyniki ekonomiczne w analizowanej fermie szynszyl

Specification Wyszczególnienie	Year Rok kalendarzowy		Total Łącznie
	2011	2012	
Output sales value, PLN Wartość produkcji, zł	51 060	64 170	115 230
Direct surplus, PLN (profit) Nadwyżka bezpośrednia, zł (dochód)	10 939	19 336	30 275
Unit profit per pelt, PLN Dochód uzyskany ze sprzedaży 1 skóry, zł	24.64	34.65	30.21

production. It is crucial to understand the dynamics of prices and costs, which may enable the preeder to anticipate market changes and to adapt to new conditions [Stępień 2004]. Breeding chinchillas in the studied farm was a profitable activity, as evidenced by the efficiency index, which was above 100%: 127.27%, in 2011, and 143.13%, in 2012 (Table 6). A similar level of the index, 137.7%, was reported by Socha and Szumska [2002]. The index of efficiency was also studied by Paluch and Kuźniewicz [1995] in chinchilla farms, and the authors reported its value: 139.3%.

Profitability is a measure of the management efficiency. The financial outcome of the business is one of the most important measures of its performance. If positive, it is called profit, and the business is refered to as profitable. In the case of a negative financial outcome, we talk about loss, and such an business is unprofitable. The index of profitability in the studied farm was 27.27%, in 2011, and 43.13%, in 2012 (Table 6), which may indicate an improvement in the breeding.

Table 6. Economic indices in the studied farm by year

Tabela 6. Wskaźniki ekonomiczne w badanej fermie w zależności od roku kalendarzowego

Specification Wyszczególnienie	Year – Rok analizy	
	2011	2012
Index of production efficiency Wskaźnik opłacalności produkcji	127.27%	143.13%
Index of production profitability Wskaźnik rentowności produkcji	27.27%	43.13%
Index of return on production Wskaźnik dochodowości produkcji	21.42%	30.13%

Breeding chinchillas requires special care, specialized production technology, and appropriate organizational solutions, which determine the economic stabilization of the production of these animals in Poland.

CONCLUSIONS

1. To sum up the issue of cost-effectiveness of chinchilla breeding, it should be noted that the cost of raising these animals was mostly influenced by the cost of feeds and salaries. End breeding efficiency was significantly influenced by the performance of the breeding stock animals (number of weaned), which is directly related to the number of pelts offered on auctions.
2. The unit net income earned from one pelt was on average PLN 30.21. This is strictly dependent on the level of costs incurred for its production. An increase in the costs is accompanied by a reduction in the size of income. Index of return on production at the level of 21.42–30.13% showed an upward trend in the analyzed farm. Index of production profitability also rose, from 27.27%, in 2011, to 43.13%, in 2012. On this basis it can be concluded that the production on the farm was profitable.
3. This relatively young farm managed to get measurable benefits, which demonstrates the viability of chinchilla breeding branch of agricultural production.

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ANALIZA OPŁACALNOŚCI HODOWLI SZYNSZYLI NA PODSTAWIE WYNIKÓW PRODUKCYJNYCH NA WYBRANEJ FERMIE

Streszczenie. Celem badań było szacowanie opłacalności chowu szynsyli w Polsce na podstawie wyników produkcyjnych w wybranej fermie, zlokalizowanej w województwie mazowieckim. Analiza obejmowała okres 2 lat, a ocenie poddano łącznie 250 zwierząt, należących do odmiany standard oraz czarna aksamitna. Cechami brannymi pod uwagę były: liczba urodzonych i odchowanych młodych szynsyli. Analizie ekonomicznej zostały poddane przychody oraz koszty fermy. Został zastosowany kalkulacyjny układ kosztów, przyjmujący podział kosztów na bezpośrednie i pośrednie. Efektywność ekonomiczną fermy oceniono na podstawie wskaźników ekonomicznych oraz wyników reprodukcyjnych fermy. Największy wpływ na koszty chowu szynsyli miały koszty zakupu pasz oraz wypłat dla pracowników. Znaczący wpływ na opłacalność hodowli miały również wyniki reprodukcyjne szynsyli. Chów szynsyli w badanej fermie był dochodowy, o czym świadczy wskaźnik opłacalności, który w 2011 roku wyniósł 127,27% a w roku następnym wzrósł do wartości 143,13%. Wykazujący tendencję wzrostową wskaźnik rentowności (27,27% w 2011 i 43,13% w 2012 roku) może świadczyć o postępie w efektywności chowu i hodowli w badanej fermie.

Słowa kluczowe: cena, koszt, opłacalność, przychód, skóra, szynszyla

Accepted for print – Zaakceptowano do druku: 22.09.2014

