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Analysis of the Production and Economic Indicators of Broiler Chicken Rearing in 2020–2023: A Case Study of a Polish Farm

Michalina Adaszyńska-Skwirzyńska [1,*], Paweł Konieczka [2,3], Mateusz Bucław [1], Danuta Majewska [1], Arkadiusz Pietruszka [1], Sławomir Zych [4] and Danuta Szczerbińska [1]

[1] Department of Monogastric Animal Sciences, Faculty of Biotechnology and Animal Husbandry, West Pomeranian University of Technology in Szczecin, Janickiego Str. 29, 71-270 Szczecin, Poland; mateusz.buclaw@zut.edu.pl (M.B.); danuta.majewska@zut.edu.pl (D.M.); arkadiusz.pietruszka@zut.edu.pl (A.P.); danuta.szczerbinska@zut.edu.pl (D.S.)
[2] Department of Poultry Science and Apiculture, University of Warmia and Mazury in Olsztyn, Oczapowskiego 5, 10-719 Olsztyn, Poland; pawel.konieczka@uwm.edu.pl
[3] The Kielanowski Institute of Animal Physiology and Nutrition, Polish Academy of Sciences, Instytucka 3, 05-110 Jablonna, Poland
[4] Laboratory of Chromatography and Mass Spectrometry, Faculty of Biotechnology and Animal Husbandry, West Pomeranian University of Technology in Szczecin, Janickiego Str. 29, 71-270 Szczecin, Poland; slawomir.zych@zut.edu.pl
* Correspondence: madaszynska@zut.edu.pl

Abstract: The study aimed to analyze and evaluate the production and economic performance of a broiler chicken farm in Poland during the years 2020–2023. Production performance was assessed by comparing final body weight (BW), feed intake (FI), feed conversion ratio (FCR), and the European Performance Efficiency Factor (EPEF). Economic results were determined using the sales value, production costs, profit (direct surplus), and profitability index (PI). During the study years, the broiler rearing period lasted on average 40 days, with six production cycles each year. The average BW was found to be 2.51 kg with an average FCR of 1.54 kg/kg. For the four production years, the EPEF was calculated, reaching a high average value of 399. Broiler chicken production in Poland was profitable despite the continuously increasing production costs. In the years studied, the cost of feed accounted for 69.6–76.1% of the total production costs, chicks 15.0–19.7%, and labor costs 1.59–2.39%. In all of the analyzed production cycles, the PI of broiler chicken rearing was above 100, averaging 120.48%, and the average profit per bird was 0.46 EUR. During the study period, several negative events occurred, including the COVID-19 pandemic, the spread of avian influenza outbreaks, and consequent fluctuations in feed and poultry prices. Despite these challenges, namely the consistently rising production costs, broiler production in the study farm remained profitable.

Keywords: broiler chicken; economic indicators; poultry production

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1. Introduction

The poultry sector plays an important role in feeding the population, providing a diverse range of nutritionally and dietary valuable low-cost poultry meat [1,2]. For several decades, poultry production has been the fastest-growing sector of animal production, playing a crucial role in the global balance of animal protein and the economies of many countries. The rapid development of poultry farming has positioned Poland as the leading producer of poultry meat in the European Union (EU), the second exporter of this meat in the EU, and the fourth global exporter in the world, and poultry breeding is the most

intensive direction of animal production in the country. Germany is second regarding poultry meat production in the EU, and France is third [3,4]. According to analysts, the development of poultry production in Poland depends primarily on the possibility of investing production surpluses in foreign markets, mainly in EU countries, but also, to an increasing extent, in the markets of third countries [3,5]. Livestock breeding and meat production in Poland and Europe are increasingly dependent on fluctuations in global market prices, particularly in terms of feed and energy costs. Socio-economic situations, such as increased cereal imports by China and Russia's invasion of Ukraine, led to a two-fold increase in poultry production costs in 2022 compared to 2020 [6,7]. However, according to a study by van Horne [8], poultry production costs in Poland are among the lowest in the EU. Differences in production costs between EU member countries result primarily from the structure of the supply chain (e.g., vertical integration), average size of farms, feed production policies, transport costs, access to seaports, water resources, and availability of grains and other feed components. An additional factor is currency exchange rate fluctuations, which apply to countries outside the eurozone. In addition, labor costs are another factor affecting differences in production costs, which in Poland remain at a relatively low level compared to other EU countries [9].

According to OECD-FAO [10], the growing demand for poultry meat will continue to drive global production. Consequently, production is expected to increase by 2030, with the majority of growth occurring in developing countries [1]. Poultry meat production is primarily carried out in intensive production systems, while extensive poultry farming systems (organic, free-range) make up only a small portion of production in the EU (around 5%). The profitability of broiler chicken production is a consequence of many factors, among which the prices of feed, chicks, and rearing technology a significant role [1,9,11–13]. Environmental factors affect the growth of chickens, feed consumption, health, and carcass quality. These relationships occur with varying intensity depending on the genotype of the chickens. The more perfect and more adapted the environment to a given genotype, the higher the slaughter efficiency [1,12,14]. The type of litter, ventilation, heating, lighting, and stocking density per unit of area determine the appropriate environmental conditions in production halls [1,11,13]. A high level of poultry production is possible thanks to modern methods of breeding and breeding birds combined with genetic progress, which has led to the creation of new lines and hybrids adapted to rapid growth. In the feeding of broiler chickens, complete mixtures with a high energy concentration are used to fully satisfy the potential of the growing birds. The first feeding period is always important because it largely determines the final fattening results [1,13].

Poultry production in economically developed countries is characterized by a high degree of vertical integration, encompassing breeding farms, hatcheries, commercial farms, feed mills, poultry slaughterhouses, and processing plants, as well as the distribution network. Recent studies indicate that the profitability of production is influenced by cost reductions resulting from the implementation of new technological solutions [15,16]. These savings can be realized by using the latest scientific advancements and new technologies, as well as by monitoring the current market situation [16]. In broiler chicken production, market conditions are variable and depend on different factors, including the prices of poultry, feed, energy, and chicks, as well as the epizootic and epidemiological situation related to the occurrence of avian influenza. Recent studies suggest that the profitability of production also depends on achieving optimal animal welfare, which involves a multifaceted approach to animal production, including changes in farm management, the implementation of health preventive programs, and maintaining better environmental conditions [1,16–21].

The research objective was to analyze and evaluate the production and economic performance indicators of broiler chicken rearing from 2020 to 2023 at a selected farm in Poland engaged in intensive broiler chicken production.

2. Materials and Methods

2.1. Data Collection

The experiment was conducted at a commercial farm (Żabówko, Poland) using unsexed Ross 308 broiler chicks from 2020 to 2023 (data from six production cycles were recorded each year—five cycles lasting 41 days and one cycle lasting 35 days). The birds were purchased from a commercial hatchery (Park Drobiarski Sp. z o.o., Śmiłowo, Poland), with the chicks originating from a single breeding flock each time. The chicks were kept in two production houses—at the beginning of rearing, the total number of broiler chickens was 47,000: 20,000 birds in the first house and 27,000 in the second one. Broilers were kept under standardized environmental conditions in accordance with the Ross 308 [22] guidelines. Gas heaters were used to warm the houses, the feed was provided using a FLEX-AUGER fill system (Chore-Time, USA), and water was supplied through nipple drinkers (Chore-Time, USA). At the beginning of the rearing period (days 1–2), the average temperature in the houses was 32–33 °C and it was gradually decreased in the following days: 30 °C (day 3), 28–30 °C (days 4–7), 26–28 °C (days 8–14), 24–26 °C (days 15–21), and around 22 °C (days 22–41). The average relative humidity in the room ranged from 50% at the beginning of the rearing period to 70% at the end, with a gradual increase observed week by week. The chickens were fed ad libitum with mixtures from a commercial feed manufacturer (Polskie Zakłady Zbożowe Sp. z o.o., Wałcz, Poland): starter (from day 1 to day 10 of the rearing period), grower I (from day 11 to day 20), grower II (from day 21 to day 30), and finisher (from day 31 until the end of the rearing period). The ingredient composition and nutritional value of the mixtures are summarized in Supplementary Materials (Table S1. Ingredient and nutrient compositions of the basal diets). On day 33 of the rearing period (for 41-day cycles), 6700 birds were processed from each rearing house. After completion of the rearing period, the chickens were transported to the slaughterhouse (IKO Kompania Drobiarska, Golczewo, Poland). Throughout the rearing period, the birds were under the supervision of the State Veterinary Inspection, and all data related to production performance, economic results, and environmental conditions of the broiler rearing were recorded for each production cycle. During the experiment, the dates of stocking and sale, number of birds (stocked, dead, and sold), body weight of the broilers (on days 1, 7, 14, 21, 28, 35, and 41), feed intake, survival rate, production costs, revenue, and income (profit) were all recorded. Based on the obtained production data, the following production indicators were determined: average body weight (BW) at the end of the production cycle (kg); rearing period (days); feed conversion ratio (FCR) (kg feed/kg gain); mortality (%); survival rate (%); and the European Performance Efficiency Factor (EPEF). Considering the obtained production results, as well as the costs and revenues from the sale of the produced poultry, the financial result of the farm (profit) and the production profitability index (PI) were calculated for each production cycle in the years 2020–2023. All activities involving the use of animals in this study were conducted in accordance with applicable legal regulations and international standards for animal welfare. The whole study was carried out in accordance with the guidelines of Act No. 1580/2023, which focuses on protection against animal cruelty.

2.2. Data Analysis

Economic efficiency involves evaluating the costs of feed, medication, energy, and other resources in relation to revenue generated from meat production. This article presents

the key production indicators of broiler chickens that affect rearing economic efficiency such as final BW, mortality, and FCR. Based on the obtained numerical data, the following parameters were calculated for each of the six production cycles in individual years: BW (kg), FCR (kg/kg), bird mortality (%), survival rate (%), EPEF, and PI (%). FCR was calculated by summing the amount of feed used to produce one kilogram of body weight, which is the main factor in reducing production costs [23]. EPEF is an indicator of the production efficiency of a given flock [23–25]. The index was calculated according to the following formula:

$$\text{EPEF} = \frac{\text{mean BW (kg)} \times \text{survival rate (\%)}}{\text{number of rearing days} \times \text{FCR} \left(\frac{\text{kg}}{\text{kg}}\right)} \times 100 \quad (1)$$

The PI was calculated using the following formula:

$$\text{PI} = \frac{\text{sales value (EUR)}}{\text{production costs (EUR)}} \times 100 \quad (2)$$

The production costs, based on the collected economic data, included the following components: purchase of chicks, feed mixtures, energy, heating, veterinary costs, labor, depreciation, and other services. The cost of energy included electricity and the cost of heating covered gas, veterinary expenses included vaccinations, medications, vitamin and herbal supplements, and veterinary fees, and labor costs encompassed wages and contributions for agricultural workers. Other services included depreciation and material costs, animal catching, manure removal, cleaning, disinfection, disposal of dead chickens, equipment repair costs, and maintenance. Litter costs were equal to manure sales and were not included in the calculations. The data collected represent gross values for the flat-rate farmer. A flat-rate farmer supplies agricultural products from his own farming activities and benefits from VAT exemption. In Poland, individual cost components are taxed at the following rates: energy—23%, gas—23%, feed—8%, chicks—8%, veterinary services—8%, and livestock—7%. The farm under study received support in 2020 amounting to 30,000 PLN from the European Agricultural Fund under the "Aid for farmers particularly affected by the COVID-19 crisis" program. By analyzing the study period from 2020 to 2023, the average EUR to PLN exchange rate was based on the average exchange rate of the National Bank of Poland (calculated from all quotations), which was 4.45 in 2020, 4.57 in 2021, 4.69 in 2022, and 4.54 in 2023. All output data (PLN) are compiled in a spreadsheet included in the Supplementary Materials.

2.3. Statistical Analysis

Statistical methods were used to process the underlying data and the resulting indicators. The results of the analyses were statistically processed using the Statistica 13.3 PL software package. Statistically significant differences were determined using Tukey's honestly significant difference (HSD) test, with a significance level set at $p \leq 0.05$.

3. Results

Table 1 summarizes the results from four years of production, with six production cycles conducted each year. The average final body weight of the birds was comparable, ranging from 2.45 to 2.56 kg. No differences were observed between the individual years in terms of feed intake during the production cycle. The average feed intake during the production cycle remained at a similar level, ranging from 174.13 to 180.90 tons per cycle. No significant differences were observed between the years in feed conversion. The average FCR (kg/kg) for all production cycles studied was 1.54 kg/kg. Differences in

chick mortality ranged from 1.77% in 2023 to 3.05% in 2020. The year of the study did not significantly affect the EPEF index, with values ranging from 388 to 412.

Table 1. Average production performance indicators for broiler rearing during four production years (2020–2023).

Index	Production Year—VI Cycles (Average ± SD)				Average
	2020	2021	2022	2023	
Final body weight (kg)	2.48 ^{a} ± 0.21	2.45 ^{a} ± 0.17	2.55 ^{a} ± 0.19	2.56 ^{a} ± 0.19	2.51
Feed consumption per production cycle (t)	174.92 ^{a} ± 18.56	174.13 ^{a} ± 13.85	180.05 ^{a} ± 14.60	180.90 ^{a} ± 13.14	177.5
FCR (kg feed/kg gain)	1.52 ^{a} ± 0.06	1.55 ^{a} ± 0.04	1.55 ^{a} ± 0.04	1.53 ^{a} ± 0.02	1.54
Mortality (%)	3.05 ^{a} ± 0.63	2.13 ^{ab} ± 0.65	2.55 ^{ab} ± 0.96	1.77 ^{b} ± 0.85	2.38
EPEF scores	395 ^{a} ± 19	388 ^{a} ± 19	401 ^{a} ± 17	412 ^{a} ± 13	399

$^{a–b}$—Statistically significant differences ($p \leq 0.05$) for the production year are marked with different letters in the superscript. SD—standard deviation.

The production costs for the years 2020–2023 are presented in Table 2. As demonstrated in the provided data, the individual components of total costs—such as feed, chicks, energy, heating, labor, depreciation, and other services—increased in the analyzed years.

Table 2. Average production costs (EUR) from six production cycles and economic efficiency of broiler chicken rearing during four production years (2020–2023).

Specification	Production Year—VI Cycles (Average ± SD)				Average
	2020	2021	2022	2023	
COSTS					
Price of 1 chick	0.32 ^{b} ± 0.004	0.33 ^{b} ± 0.01	0.41 ^{a} ± 0.03	0.44 ^{a} ± 0.002	0.37
Price of 1 kg of feed mixture	301.35 ^{d} ± 1.35	382.93 ^{c} ± 15.75	539.45 ^{a} ± 4.69	443.61 ^{b} ± 45.37	418.64
Chick purchase	14,839.32 ^{b} ± 208.54	15,392.34 ^{b} ± 562.14	19,6073.99 ^{a} ± 1366.31	94,392 ^{a} ± 192	17,556.36
Feed purchase	52,749.21 ^{c} ± 5837.75	66,787.75 ^{b} ± 7427.13	97,119.40 ^{a} ± 7942.86	20,791.19 ^{b} ± 11,616.96	74,590.79
Energy	1209.66 ^{c} ± 41.12	1327.57 ^{c} ± 100.44	1782.09 ^{b} ± 95.95	2874.45 ^{a} ± 399.78	1801.54
Heating	1574.61 ^{b} ± 630.03	2403.28 ^{ab} ± 682.71	2562.26 ^{ab} ± 765.46	2901.10 ^{a} ± 650.22	2397.15
Veterinary costs	1385.84 ^{b} ± 57.98	2414.22 ^{a} ± 132.60	2324.09 ^{a} ± 129.42	2312.76 ^{a} ± 535.02	2116.23
Labor	1797.75 ^{d} ± 0.01	1969.36 ^{c} ± 0.01	2025.59 ^{b} ± 0.01	2165.86 ^{a} ± 56.83	1991.86
Depreciation and services	2093.70 ^{d} ± 48.09	2188.18 ^{c} ± 0.01	2604.90 ^{b} ± 113.43	2955.29 ^{a} ± 127.31	2464.47
Total costs	75,650.11 ^{d} ± 6380	92,482.93 ^{c} ± 8605.69	127,492.32 ^{a} ± 7700.85	114,537.44 ^{b} ± 11,653.30	102,918.2
PROFITABILITY					
Price per kg of live weight	0.73 ^{d} ± 0.01	0.98 ^{c} ± 0.02	1.35 ^{a} ± 0.02	1.21 ^{b} ± 0.08	1.07
Sales value	82,215.50 ^{c} ± 6795.51	110,614.22 ^{b} ± 8822.10	157,500.64 ^{a} ± 11,974.84	143,568.94 ^{a} ± 17,112.55	124,004.82
PI (%)	108.68 ^{b} ± 3.00	119.60 ^{a} ± 3.00	123.53 ^{a} ± 4.00	125.35 ^{a} ± 5.00	120.48
Profit from 1 production cycle	6565.39 ^{c} ± 2095.28	18,131.29 ^{b} ± 1881.18	30,008.32 ^{a} ± 5604.69	29,031.50 ^{a} ± 7244.49	21,086.62
Average profit per bird	0.14 ^{c} ± 0.04	0.39 ^{b} ± 0.04	0.65 ^{a} ± 0.12	0.62 ^{a} ± 0.15	0.46
Average profit per 1 kg of live weight	0.06 ^{c} ± 0.01	0.16 ^{b} ± 0.02	0.26 ^{a} ± 0.04	0.24 ^{a} ± 0.05	0.18

$^{a–d}$—Statistically significant differences ($p \leq 0.05$) for the production year are marked with different letters in the superscript. SD—standard deviation.

The average price per 1 ton of feed mixture ranged from 301.35 EUR in 2020 to 539.45 EUR (+88.66%) in 2022. Similar trends were observed for the price per 1 kg of broiler live weight. The lowest average price ranged from 0.73 EUR in 2020 to 1.35 EUR (+94.77%) in 2022.

The comparison of the structure of average broiler rearing costs during four production years is presented in Table 3. The feed cost in the farm under study accounted for 69.6% to 76.1% of the total costs, chicks—9.7–15.0%, energy—1.40–2.55%, heating—2.01–2.62%,

veterinary prophylaxis and treatment—1.84–2.62%, wages—1.59–2.39%, and depreciation and other services—2.05–2.78%. In each of the four years of the study, the sales value exceeded the total costs (Table 2). The average sales value per production cycle ranged from 82,215.50 EUR in 2020 to 157,500 EUR in 2022, while total costs ranged from 75,650.11 EUR in 2020 to 127,492.32 EUR in 2022.

Table 3. Average cost structure (%) of rearing broilers during four production years (2020–2023).

Specification	Production Year—VI Cycles (Average ± SD)				Average
	2020	2021	2022	2023	
Feed	69.6 ^{b} ± 1.9	72.1 ^{b} ± 1.4	76.1 ^{a} ± 1.9	70.0 ^{b} ± 2.9	71.9
Chicks	19.7 ^{a} ± 1.5	16.7 ^{bc} ± 1.1	15.0 ^{c} ± 1.5	18.3 ^{ab} ± 1.8	17.4
Energy	1.61 ^{b} ± 0.15	1.44 ^{b} ± 0.05	1.40 ^{b} ± 0.15	2.55 ^{a} ± 0.54	1.75
Heating	2.05 ^{a} ± 0.73	2.58 ^{a} ± 0.69	2.01 ^{a} ± 0.58	2.62 ^{a} ± 0.31	2.31
Veterinary costs	1.84 ^{b} ± 0.14	2.62 ^{a} ± 0.12	1.83 ^{b} ± 0.13	2.04 ^{b} ± 0.51	2.08
Labor	2.39 ^{a} ± 0.20	2.15 ^{ab} ± 0.21	1.59 ^{c} ± 0.11	1.91 ^{b} ± 0.22	2.01
Depreciation and other services	2.78 ^{a} ± 0.25	2.38 ^{ab} ± 0.23	2.05 ^{b} ± 0.19	2.61 ^{a} ± 0.33	2.46

$^{a–d}$ Statistically significant differences ($p \leq 0.05$) for the production year are marked with different letters in the superscript. SD—standard deviation.

4. Discussion

The efficiency of broiler chicken production depends on a number of factors, including technological solutions in poultry houses and their continuous improvement, as well as the maintenance of optimal environmental conditions during rearing, nutrition, and applied prophylaxis. The efficiency of broiler chicken production is influenced by results, such as BW, survival rate, FCR, rearing time, and financial investments in production [21]. Feed constitutes the most expensive position in the cost structure. The data (Table 3) show that feed accounted for an average of 71.9% of the costs, followed by the cost of purchasing chicks, which averaged 17.4%, and depreciation along with other services (such as cleaning and disinfecting poultry houses), which accounted for an average of 2.46%. Next in the cost structure were heating, accounting for an average of 2.31%, prophylaxis and treatment, at 2.08%, wages, at 2.01%, and energy costs, at 1.75%. According to studies by other authors, the profitability of poultry production is determined by the cost of purchasing feed mixtures [23–25]. Therefore, FCR is a very important indicator affecting the profitability of production. FCR represents the amount of feed used to produce one kg of living weight, which is a major factor in reducing production costs [19].

Efficient feed utilization by broiler chickens is the goal in every production cycle. The ratio between the cost of feed required to produce 1 kg of body weight and FCR depends on the protein and energy concentration in the feed and the chickens' ability to convert it. Broiler chickens have a high feed intake and a tendency to consume excessive amounts of feed, especially when the energy-to-protein balance is disturbed [26–30]. Considering the significant share of feed purchase costs in total production costs, improving FCR can be a practical way to increase production efficiency by reducing costs per kilogram of body weight [31,32]. According to the Ross 308 guidelines, broilers at 41 days of age should reach a body weight of 2.82 kg with a feed intake of 1.59 kg per kg of body weight [22]. The analyzed data from the present study show that the FCR was 1.55 (kg/kg) on average with an average BW of 2.51 kg. It should be emphasized that the production results are significantly influenced by the health of the birds as well as the quality of the chicks.

According to Van Horne [8], the average BW of broiler chickens produced worldwide in 2017 ranged from 1.9 to 2.7 kg in each country surveyed. Therefore, production efficiency cannot be assessed solely based on the average BW, but other indicators such as the length of the production cycle and mortality in the flock should also be considered. In the present

study, the average production cycle lasted 40 days, while in a study by Beal et al. [28], who compared broiler production in the United States of America (USA), the average fattening period was 47 days. In the EU, the average duration of intensive broiler chicken fattening ranges from 35 to 42 days, depending on the expected slaughter weight [8]. Mortality (%) is an indicator of flock quality and is fundamentally related to chick quality and environmental conditions [20]. According to Szollosi et al. [26], producers should strive to obtain a mortality rate of less than 0.7%. In the current study, the average mortality rate was 2.38%, with the lowest rate recorded in 2023 at 1.77%, while the highest, at 3.05%, was observed in 2020. This could have been caused by lower chick quality during the coronavirus pandemic [33]. Other authors reported average mortality rates in Ross 308 broiler flocks ranging from 1.0% to 7.10% [1,16,26,28,30]. Data on the production efficiency of broiler chickens are used to calculate the EPEF. The higher the EPEF value, the more favorable the production result of broiler chickens, and production with an EPEF above 220 is considered effective [24]. The levels of the EPEF index are shown in Table 1. The production results achieved between 2020 and 2023 were very high, ranging from 388 in 2021 to 412 in 2023. According to Karaman et al. [34], an EPEF value exceeding 190 can be considered satisfactory. However, many authors believe that the EPEF value should not fall below 220 [19,24]. Poultry companies are improving breeds used in breeding programs, resulting in a significant improvement in performance traits compared to previously used chicks, which in turn translates into improved production indicators [1,19,35].

The revenue generated and potential profit are determined by production costs and the sales value. The PI is used to evaluate the economic performance of the farm, averaging in the present study from 108.68% in 2020 to 125.35% in 2023. In the first year of the study (2020), broiler chicken production was conducted at the border of profitability, as the profitability index was 108.68%. The main reason for the collapse of the poultry market in Poland and worldwide was the aftermath of the COVID-19 epidemic [33,35–41]. The coronavirus pandemic and its associated restrictions caused problems in many sectors of the economy, including agriculture. The implementation of strict restrictions in many countries, including quarantines, social distancing, lockdowns, import-export limitations, disruptions in the supply chain for hotels, restaurants, and catering services, as well as the closure of various businesses, had severe consequences for the functioning of the agri-food market in Poland and rest of the world [36]. After the first phase of the SARS-CoV-2 pandemic, most European countries reduced poultry production, while in Poland, there was an increase in production and an oversupply of poultry meat. Rising feed costs and increasingly lower broiler chicken purchase prices led to a decrease in production profitability [41–43]. However, profitability significantly improved from 2021, reaching levels between 119.6% and 125.35% in the current study. The profitability of the fattening on the studied farm from 2021 onward was positively affected by the favorable purchase prices of poultry, which in the years under study varied significantly and ranged from 0.73 EUR in 2020 to 1.35 EUR in 2022, with the average price of feed mixture from 301.35 EUR in 2020 to 539.45 EUR in 2022. Despite the lower live weight prices in 2023 (averaging 1.21 EUR), the profitability of chicken production was higher than in 2022, when the average price for 1 kg of live weight was 1.35 EUR (+13.11%). The increase in profitability during the aforementioned years was due to the lower average price of feed, which was 539.45 EUR in 2022 and 443.61 EUR in 2023 (−20.39%). In 2022, a decline in poultry prices was recorded, driven by increased production both in Poland and in other major EU producers. Combined with lower feed prices, the profitability of poultry production increased and remained at a high level. As a result, producers decided to increase their production capacity. In 2020, Poland produced 2,243,000 tons of poultry meat, while Germany produced 1,370,000 tons. In 2022, poultry meat production was as follows: in

Poland—2,503,000 tons, and in Germany—1,380,000 tons [3,44]. In France, 1,179,000 tons of poultry meat were produced in 2020, while in 2022, production reached 1159,000 tons [3]. The decline in poultry production in France may be attributed to systemic changes and the epidemiological situation related to avian influenza, which has been reported in the southwestern part of the country. Factors contributing to this outbreak include the high concentration of free-range poultry farms, the diversity of species and age of production sites, the complexity of bird and human translocation, and the proximity to bird migration corridors [45]. In addition, France is transitioning from a poultry exporter to a market where meat is imported. In Poland, on the other hand, export is the main factor driving the development of the poultry industry. According to AVEC [3], poultry meat exports from Poland amounted to 1495 thousand tons in 2020 and 1586 thousand tons in 2022, of which 554 thousand tons were exported to third countries. It should be noted that countries outside the EU, such as the United Kingdom, China, Japan, Saudi Arabia, and Ukraine, are gaining increasing importance in the export of poultry meat from Poland [3,5]. It seems necessary to diversify the geographical directions of Polish exports, as the poultry sector in countries like Ukraine is developing dynamically, which may lead to a reduction in exports from Poland to Ukraine. An important advantage of Ukraine, among other factors, is the significantly lower feed prices compared to the EU, and the price of forage is the most important component of poultry production costs [8,46,47]. The poultry sector in Brazil, Argentina, and the USA has similar advantages to Ukraine. Additionally, European producers are dependent on South American suppliers due to the limited availability of soybeans and corn. Feed prices in Europe are affected by storage, transportation, customs duties, and margins, resulting in higher feed costs [8]. In addition, poultry production costs in Brazil, Argentina, the USA, and Ukraine are lower than in the EU due to the absence of legal regulations concerning many aspects of poultry production, such as environmental protection, the use of antibiotics, and the composition of feed mixtures. It should be emphasized that despite the higher cost of poultry meat production in the EU, European poultry meat is highly valued worldwide due to its high quality, which is a decisive factor for many importers when making purchasing decisions. Animal welfare requirements are among the most stringent in the world. However, competitively priced products offered by non-EU countries will negatively impact Polish poultry exports in the coming years. One way to compete in the EU market may be through the effective use of non-price competition instruments, such as efficient distribution systems and continuous improvement in product quality [5,47].

The production profit (direct surplus) is the difference between the sales value and production costs. The present study showed differences in the production profit per 1 kg of live weight in each production year. The lowest profit per 1 kg of live weight was achieved in 2020, averaging 0.06 EUR, while the highest was recorded in 2022, averaging 0.26 EUR. Poland, as the largest producer of broiler chickens in the EU, has continued its production growth since 2022. The recovery in poultry production was facilitated by its continued high profitability, which encouraged producers to increase their production capacity and farm populations.

5. Conclusions

The analysis of data covering production and economic indicators during the research period from 2020 to 2023, based on a selected farm in Poland, showed that the rearing of broiler chickens lasted an average of 40 days, with six production cycles each year. It was found that the average BW was 2.51 kg, with an average FCR of 1.54 kg/kg. The EPEF was calculated for the four production years, reaching a high level with an average value of 399. During the study period, several negative events occurred, including the COVID-19

pandemic (SarsCoV2), the spread of avian influenza outbreaks, and consequent fluctuations in feed and poultry prices. Despite these challenges, broiler production in the study farm remained profitable, despite the consistently rising production costs. This was caused by the increase in the price of live poultry. In the years studied, the cost of feed accounted for 69.6–76.1% of total production costs, chicks 15.0–19.7%, and labor costs 1.59–2.39%. In all analyzed production cycles, the PI of broiler rearing exceeded 100, averaging 120.48%, and the average profit per bird was 0.46 EUR.

Considering the current state of poultry production in Poland and the situation in the EU market, we estimate that poultry meat production in the study farm will retain its current profitability. An important risk factor for this prediction is the spread of avian influenza, both in Poland and other EU producers. The farm under study has not improved its breeding technology in rearing during the period 2020–2023. Additional improvements in poultry production performance and profitability may be achieved through, for example, either the introduction of new technology or by feeding change enhancements. The profitability of poultry production can be influenced by the implementation of precision animal husbandry and feeding, which can lead to increased productivity, reduced operational costs, including labor, higher profitability and food safety, improved animal welfare, increased workplace safety, and reduced energy consumption. Comprehensive monitoring of various environmental factors and animal responses, available in many precision livestock management systems or disease detection devices, provides rapid alerts about health risks. This can help reduce the need for treatment and improve the welfare of birds. Precision feeding and automated animal housing systems can also reduce environmental impact. However, the main limitation of the application of new technologies on farms is the high investment cost of the installation, which is not cost-effective for extensive and low-input farms.

Supplementary Materials: The following supporting information can be downloaded at https://www.mdpi.com/article/10.3390/agriculture15020139/s1: Table S1: Ingredient and nutrient compositions of the basal diets.

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Institutional Review Board Statement: Broiler chickens came from a private breeder (PL 32044946). Ethical review and approval were waived for this study because the experiments were conducted under production conditions. The animals were not subjected to pain, suffering, distress, or lasting harm and were not affected in any other way. Feed and water were provided ad libitum. The whole study was carried out in accordance with the guidelines of Act No. 1580/2023, which focuses on protection against animal cruelty.

Data Availability Statement: Data are contained within the Supplementary Materials.

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