

COMPARATIVE INVESTMENT ANALYSIS OF SMALL-SCALE BROILER AND LAYER ENTERPRISES IN OSUN STATE, NIGERIA

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Abstract: The study investigated the investment patterns, costs and return structures of the layer and broiler production in Osun State, Nigeria. It also compared their net present value in the study area to determine their investment returns. A multistage sampling technique was employed in selecting respondents for the study. Primary data were collected from 180 broiler and layer farms, comprising 90 broiler farms and 90 layer farms from six local governments in Osun State using a structured questionnaire. The data were analysed using descriptive statistics, budgetary techniques and investment tools. The investment pattern indicated that a larger amount of money was invested in capital assets for small-scale layers (₦651,274.5) compared to broilers (₦448,068.6). Personal saving was the major source of funding among the small-scale layer enterprises compared to that of broiler enterprises. In addition, the survival of re-investment in small-scale layers depends largely on funds from family members while the small-scale broiler enterprise depends on retained earnings. The budgetary analysis showed that the gross margin of the farmers was ₦166,321.8 and ₦1,150,470.8 for broiler and layer enterprises, respectively. Investment analysis revealed that the layer enterprise had a higher positive net present value (NPV) and the internal rate of return (IRR) value of ₦1,523,692.6 and 64.9 per cent, respectively. In contrast, the broiler enterprise had lower positive NPV and IRR values of ₦961,173.3 and 63.0 per cent, respectively. The study concluded that the small-scale layer enterprise was found to be more economically profitable compared to the small-scale broiler enterprise with higher NPV and IRR values and a shorter discounted payback period in Osun State.

Key words: broilers, layers, NPV, IRR, discounted payback period.

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Introduction

In developing nations, most poultry farmers embark on small-scale poultry enterprises due to difficulty in obtaining sufficient inputs. Thus, they are found in the rural area where production inputs are difficult to obtain and the marketing outlet is not well organised (Adeyemo and Onikoyi, 2012). Therefore, these are farms with fewer than 1,000 birds. Medium-scale poultry enterprises have between 1,000 and 5,000 birds. Farms that produce more than 5,000 birds are large-scale (Busari and Okanlawon, 2015). Mostly, small-scale farmers engage in the production of broilers and layers with the primary aim of generating income (Okonkwo, 2016). Moreover, the production costs per unit of broiler production are relatively lower compared to other types of poultry (layers) and returns on investment are high. Therefore, a small amount of start-up capital is needed by farmers for a broiler poultry farm. It has a short production cycle (payback period). As such, capital cannot be held down over a long period (Van Veenhuizen and Danso, 2007). Poultry production of broilers assures fast returns within weeks, whereas it is months in the case of layers (Anang et al., 2013). Furthermore, small-scale broiler production can produce meat within eight weeks while small-scale layer farms play an important role in the supply of eggs in addition to poultry meat, thereby contributing to national protein supply (Kabir and Haque, 2010).

According to Okonkwo (2016), most small-scale broilers reach slaughter weight at between 5 and 7 weeks of age, although some layers reach slaughter weight at approximately 14 weeks of age while layers start dropping eggs between 22 and 24 weeks. However, they are constrained by the rising cost of inputs, particularly of feed and medication (Ahmad and Kiresur, 2016). Broiler production has the advantage of the fast growth rate, cheaper, higher feed conversion efficiency when compared to other livestock enterprises such as layer production.

Furthermore, an investment for income, risk and resale value should be evaluated with the ultimate goal of measuring how the given investment is a good fit for a portfolio (James, 2013). Cost and benefit analysis is the essence of investment analysis of the production of layers and broilers. This becomes the basis of the whole decision-making process under resource constraints, which are put into alternative uses (Mwansa, 2013). Having the limited reversibility of investment projects, it is significant to consider many business opportunities and all associated risks before making a final investment decision (Mwansa, 2013). Investment appraisal is the starting point to determine the worthiness of a prospective project. The economic profitability of each enterprise determines the attractiveness of the enterprise. The more economically profitable a project is, the more attractive it is for investment and vice versa (Mwansa, 2013).

Despite the nutritional value of poultry meat and egg, the production in the country is very insufficient, as reflected by the wide interval between supply and

demand of the products (Ohajinya et al., 2013). Local demand for poultry products in Nigeria is about 1.5 million tonnes. The supply capacity is between 700,000 and 1 million tonnes, but the poultry production capacity of farms must increase rapidly to meet the increasing demand. To achieve this, the current production level must be improved. In developing countries, most poultry farmers start small-scale poultry enterprises due to the difficulty of obtaining sufficient input.

Many studies (Adepoju, 2008; Olasunkanmi 2008; Taru et al., 2010; Ike and Ugwumba, 2011; Mahama et al., 2013; Olufemi and Adeolu; 2013; Ohajianya et al., 2013; Anang et al., 2013; Tanko and Aji, 2014) were done separately on layer and broiler production enterprises with a greater focus on egg production. However, all these studies failed to compare the investment pattern and net worth of these two categories of poultry production. Thus, the aim of this study is to provide answers to the following research questions: What are the investment patterns of small-scale broiler and layer production? What is the cost and benefit structure of the small-scale layer and broiler production? Is investment in small-scale broiler or layer production economically viable? How comparable is their economic profitability? The specific objectives are to investigate the investment pattern of small-scale broiler and layer production, estimate costs and returns structures of layer and broiler production, and compare the net value of small-scale broiler and layer production.

Material and Methods

The study was conducted in Osun State. Osun State is located in the geopolitical zone of southwestern Nigeria. The state is bordered by Ogun State to the south, Oyo State to the west, Kwara State to the north and Ondo State to the east. It lies between longitude 040 00'E and 050 05'E and latitude 050 58'N and 080 07'N (Omodele and Okere, 2014). There are two separate climate seasons. The rainy season is between March and October, and the dry season between November and early March. The state is a typical rainforest with an average annual rainfall ranging from 880 mm to 2,600 mm and the temperature varies between 25 and 27.5°C, and it is also characterised by forest vegetation (BBC Weather Center, 2008). The majority of the population in the state is agricultural farmers. The production of livestock such as goats, sheep, pigs, rabbits and poultry (chicken) is popular in the area (Adepoju, 2008). The state covers an area of 14,875 square kilometres; of which 9,251 square kilometres are bounded by other territories such as Kwara, Ondo, Oyo, Ogun and Ekiti States. It has 30 local government areas. The state of Osun is large and its population is estimated at approximately 3,423,535 people (Deji, 2012). It has six cities. These include Ede, Ife, Ilesha, Ikirun, Iwo and Oshogbo.

The target population was small-scale broiler and layer producers in Osun State. A multistage sampling technique was employed in selecting respondents for the study. The first stage involved random selection of two agricultural zones (Osogbo and Ife-Ijesha zones) out of the three agricultural zones (Osogbo, Iwo and Ife-Ijesha zones) in Osun State in order to obtain a good geographical spread of the areas. In the second stage, three local government areas were randomly selected from each of the two agricultural zones (Ife-Central, Ife-North, Ilesa-West, Osogbo, Odo-Otin and Obokun LGAs). The third stage involved purposive selection of three communities from each LGA (giving a total of 18 communities) based on a high concentration of poultry producers through the registered poultry farmers' association in the zones. The fourth stage involved the selection of ten poultry farmers from each community using a simple random sampling technique (giving a total of 180 respondents). Respondents were stratified into 90 broiler producers and 90 layer producers. The primary data were collected using a pre-tested and validated questionnaire. The variables observed were: the farm capital outlays of the respondents, and quantities and prices of inputs and outputs in the area during the 2017/2018 production season. The descriptive statistics, budgetary technique, and investment tools were used to analyse data collected.

The budgetary technique was used to estimate the costs and returns on the small-scale broiler and layer production. The different types of inputs used and their cost implications were analysed using the enterprise budget analysis. The cost was divided into variable costs and fixed costs. The variable costs included the cost of labour, day-old chicks, medication, transport, feeding, utility and general management of birds. Fixed costs included depreciation on fixed assets (e.g. building, battery cages, water trough, etc.); this was charged using the straight-line method. The enterprise budget equations are as follows:

Gross margin (GM),

$$GM = \sum p_i q_i - \sum r_i x_i, \quad (1)$$

where

p_i = the average price of eggs per crates, broilers and layers sold (₦),

q_i = the average quantity of sold eggs in a tray, broilers and layers sold per production cycle,

r_i = the average price of variable inputs (₦),

x_i = the average quantity of variable inputs used (kg).

Subsequently, the net return was obtained from gross margin:

$$NR = GM - TFC, \quad (2)$$

where NR = Net returns; TFC = Total fixed cost.

In accordance with Ekunwe and Soniregun (2007), the following economic comparisons were used to measure the economic performance of the farms: the rate

of return on investment (ROI); operating expense ratio (OER); profit margin (PM); and benefit-cost ratio (BCR).

The rate of return on investment (ROI) shows the amount gained on every naira (₦) invested. It is measured as:

$$\text{ROI} = \frac{\text{NFI}}{\text{TC}} \times 100, \quad (3)$$

where:

NFI is net farm income, and

TC is the total cost.

$$\text{Operating expense ratio} = \frac{\text{Total variable cost}}{\text{Gross revenue}} \quad (4)$$

$$\text{Profit margin} = \frac{\text{NFI (₦)}}{\text{Total revenue (₦)}} \times 100 \quad (5)$$

$$\text{Benefit-cost ratio (BCR)} = \frac{\text{Total revenue}}{\text{Total cost}} \quad (6)$$

The following assumptions were made for the layer enterprise:

- 1) The foundation stocks were day-old chicks.
- 2) The mortality rate was 10 per cent.
- 3) The production period was 12 months and the production cycle was 18 months.
- 4) Layers started to lay eggs at 6-month-old and continued to lay eggs until 18 months. The total laying period was 12 months.

The layer enterprise had two sources of revenue: namely, eggs laid and culled hens for meat.

The following assumptions were made for the broiler enterprise:

- 1) The foundation stocks were day-old chicks.
- 2) The mortality rate was 10 per cent.
- 3) The production period was 6 months and the production cycle was 18 months.

Adopting the analytical technique of Mwansa (2013), investment tools such as net present value (NPV) and internal rate of return (IRR) and discounted payback period were used to analyse and compare the net present value of the small-scale broiler and layer production.

The net present value:

$$\text{NPV} = \frac{\text{CF}_1}{(1+i)^1} + \frac{\text{CF}_2}{(1+i)^2} + \frac{\text{CF}_3}{(1+i)^3} + \dots + \frac{\text{CF}_n}{(1+i)^n} - C_0 \quad (7)$$

where,

CF_n – Cash flow at period n (from n number of sales of broilers, eggs and culled hens)

C_0 – Initial cost of investment (costs of land, building, battery cages, drinkers, and feeders)

i – Discount rate.

Internal Rate of return

Discount rate offered for investing by creditors to farmers was used. The IRR will make NPV equals zero.

$$NPV = \frac{CF_1}{(1+i)^1} + \frac{CF_2}{(1+i)^2} + \frac{CF_3}{(1+i)^3} + \dots + \frac{CF_n}{(1+i)^n} - C_0 = 0 \quad (8)$$

Results and Discussion

Investment patterns of small-scale broiler and layer enterprises

The investment patterns in small-scale broiler and layer enterprises are shown in Tables 1, 2 and 3. These indicate the various commitments of funds to these enterprises at present and in anticipation of some positive rates of return in the future. The investment patterns encompassed: capital inputs, the distribution of initial sources of funds and sources of finance for subsequent investment. A larger amount of money was invested for capital assets in small-scale enterprises for layers compared to broiler enterprises. This shows that personal savings were predominantly used to fund the small-scale layer enterprise compared to that of broilers (Table 2). To infer, the survival of re-investment in small-scale layers depended largely on funds from family members while small-scale broilers depended largely on retained earnings (Table 3). The small-scale broiler and layer enterprises were reflections of submission by Pawariya and Jheeba (2015) who showed that layer farms needed higher investment and the profitability was greater compared to broiler farms.

Percentage distribution of enterprises by investment patterns

Table 1. Enterprises by costs of capital assets.

Assets	Layer costs (₦)	Percentage	Broiler costs (₦)	Percentage
Land	204,182.07	31.35	200,000.00	44.64
Housing	319,738.50	49.09	232,501.70	51.89
Battery cages	101,718.70	15.62	-	-
Crates	9,817.31	1.51	-	-
Feeders	8,887.67	1.36	8,887.77	1.98
Drinkers	6,930.26	1.06	6,829.22	1.52
Total	651,274.51	100.00	448,068.69	100.00

Source: Field survey, 2018.

Table 2. Enterprises by the source of initial capital.

The initial source of funds	Layers		Broilers	
	Frequency	Percentage	Frequency	Percentage
Own resources	34.00	40.00	15.00	18.75
Family loan	28.00	32.95	46.00	57.50
Community loan	6.00	7.05	7.00	8.75
Money lender	6.00	7.05	5.00	6.25
Commercial banks	11.00	12.95	7.00	8.75
Total	85.00	100.00	80.00	100.00

Table 3. Enterprises by the source of reinvestment.

Source of reinvestment	Layers		Broilers	
	Frequency	Percentage	Frequency	Percentage
Retained earnings	29.00	34.12	45.00	57.69
Debt	7.00	8.24	3.00	3.85
Family	49.00	57.64	30.00	38.46
Total	85.00	100.00	80.00	100.00

Source: Field survey, 2018.

Relative costs and returns (₦) to broiler and layer enterprises

The results of costs, returns and profitability of broiler and layer enterprises are presented in Table 4. It was found that an average poultry farmer invested about ₦332,699.3 and ₦1,082,060.7 as total costs of production for broiler and layer enterprises respectively. These included stocking, feeding, labour, medication, transport and utility and other costs. The stocking cost for small-scale broilers was 12.8 per cent while the cost for layers was 4.1 per cent as the percentage of the total costs. The feeding costs for the two categories of enterprises constituted the largest share of the total costs for broiler farms (46.3%) and layer farms (60.3%). These results support the findings of Oladeebo and Ojo (2012) and Busari and Okanlawon (2015) that feed cost is the major important cost item associated with broiler and layer production probably due to an increase in the cost of maize, groundnut cake, soybean meal and the scarcity of wheat offal (Busari and Okanlawon, 2015). This was followed by the cost of labour for broilers (15.1%) and layers (11.3%). Costs of medication for broiler farms (1.5%) and layer farms accounted for (1.7%) as percentages of the total costs. Costs of transportation for broiler and layer enterprises were 1.5% and 2.1%, respectively. The utility and other costs as percentages of total costs were 2.7% and 3.8% for broiler and layer enterprises, respectively.

Table 4. Costs and returns (₦) to broiler and layer enterprises (for one production cycle).

s/n	Items	Layer enterprise	Cost as % of TC	Broiler enterprise	Cost as % of TC
1	Foundation stock size	337 day-old chicks		304 day-old chicks	
a	Total revenue	2,050,997.00		432,000.00	
2	Variable cost				
i	Stocking	43,820.00	4.05	42,518.00	12.78
ii	Feeding	652,114.09	60.27	153,982.02	46.28
iii	Labour	121,954.80	11.27	50,138.92	15.07
iv	Medication	18,800.20	1.74	5,002.13	1.50
v	Transport	23,094.17	2.13	5,003.03	1.50
vi	Utility and other costs	40,742.93	3.77	9,034.05	2.72
b	Total variable cost	900,526.19	83.22	265,678.15	79.86
c	Gross margin	1,150,470.81		166,321.85	
3	Fixed costs				
i	Depreciation on cages	43,717.38	4.04	-	-
ii	Depreciation on building	91,733.60	8.48	51,045.60	15.34
iii	Depreciation on feeders/ drinkers	40,164.40	3.71	10,056.40	3.02
iv	Depreciation on other fixed inputs	5,919.10	0.55	5,919.10	1.78
d	Total fixed costs	181,534.48	16.78	67,021.10	6.19
e	Total costs	1,082,060.67		332,699.25	
f	Net farm income	968,936.33		99,300.75	
g	Rate of return on investment (₦) = f/e		0.90		0.30
h	Operating expense ratio (%) = b/a		44.00		61.00
i	Benefit-cost ratio = a/e		1.90		1.30
j	Profit margin % = f/a		47.24		22.99

Source: Field survey, 2018.

Table 4 indicates that the total revenues of ₦432,000 and ₦2,050,997 were earned by average small-scale broiler and layer farmers, respectively. The analysis further showed that the net farm incomes received by average small-scale broiler and layer farmers were ₦99,300.75 and ₦968,936.33, respectively. All the profitability ratios confirmed that the small-scale layer enterprise was more profitable compared to the broiler enterprise (Table 4). The profit margin percentage of the layer enterprise was higher (47.2%) compared to 22.9 per cent of the broiler enterprise. This is in agreement with Bamiro (2008) who asserted that the egg production enterprise recorded a higher gross margin while the broiler

production enterprise recorded a lower gross margin. Similarly, based on the submission by Memon et al. (2015), it was asserted that higher profit was observed in poultry egg farming in Quetta with a higher benefit-cost ratio compared to the broiler enterprise. The reason for the discrepancy in foundation stock sizes of the two enterprises is that layer farmers purchase more day-old chicks than broiler farmers in the study area.

Relative investment analysis for small-scale broiler and layer enterprises

Tables 5 and 6 present the results for the layer enterprise with a positive NPV of ₦1,523,692.6 and IRR of 64.9 per cent while the broiler enterprise showed a positive NPV of ₦961,173.3 with IRR of 63.0 per cent. The positive NPVs are indications that both enterprises were economically profitable for investment, but the layer enterprise was more economically viable with a higher NPV value and positive IRR compared to the broiler enterprise, hence, more attractive for investment. Similarly, the discounted payback period was estimated to reveal the number of years it took the small-scale poultry producers to pay back their initial investments. The result of the discounted payback period showed that the layer enterprise paid back its initial investment in one year, three months and one week while the broiler enterprise was able to pay back after two years and two weeks (Table 7). The layer enterprise was more attractive for investment than the broiler enterprise as it provided more naira in return on each naira that was invested (Tables 5 and 6). The broiler enterprise had the quickest income generation period and provided income at a specific short time interval, unlike the layer enterprise. Broilers took eight weeks to complete one production cycle and required just two weeks for cleaning and sanitation between successive cycles.

Table 5. The net present value and internal rate of return for the small-scale layer enterprise (with one production cycle).

Year	0 (₦)	1 (₦)	2 (₦)	3 (₦)	4 (₦)	5 (₦)	6 (₦)	7 (₦)
Cash inflows	-	892,498.50	1,158,498.50	998,498.50	1,162,698.50	967,538.82	1,168,426.30	1,062,432.15
Cash outflows	-	600,350.79	550,321.54	606,566.89	538,992.13	600,300.42	520,121.53	500,190.42
Net cash inflows	-	292,147.71	608,176.96	391,931.61	623,706.37	367,238.40	648,304.77	562,241.73
Initial investment	(651,274.51)							
Discounted net cash flows	(651,274.51)	259,686.85	480,534.88	275,266.09	389,376.82	203,791.22	319,789.41	246,521.85
NPV	1,523,692.62							
IRR	64.96%							

Discount rate: 12.5%. Source: Field survey, 2018.

Table 6. The net present value and internal rate of return for the small-scale broiler enterprise (two production cycles).

Year	0 (₦)	1 (₦)	2 (₦)	3 (₦)	4 (₦)	5 (₦)	6 (₦)	7 (₦)
Cash inflows	-	864,000.00	870,000.00	895,036.00	885,456.00	899,342.00	909,000.00	936,000.00
Cash outflows	-	601,356.30	608,870.46	541,587.14	542,937.52	560,429.86	577,291.74	580,915.12
Net cash inflows	-	262,643.70	261,129.54	353,448.86	342,518.48	338,912.14	331,708.26	355,084.88
Initial investment	(448,068.69)							
Discounted net cash flows	(448,068.69)	233,461.07	206,324.57	248,238.43	213,832.61	188,072.16	163,621.79	155,691.36
NPV	961,173.30							
IRR	63.03%							

Discount rate: 12.5%. Source: Field survey, 2018.

Table 7. The relative discounted payback period for small-scale broiler and layer enterprises.

Enterprises	Discounted cash flows			Discounted payback period		Post payback cash inflow
	0 (₦)	1 (₦)	2 (₦)	3 (₦)	4 (₦)	(₦)
Layers	(651,274.51)	259,686.85	480,534.88	-	1 year, 3 months, 1 week	88,947.22
Broilers	(448,068.69)	233,461.07	206,324.57	248,238.43	2 years, 2 weeks	239,955.38

Discount rate: 12.5%. Source: Field survey, 2018.

In contrast, layers took a minimum of 24 weeks before stable income began and the layer enterprise provided steady and continuous cash inflows that lasted for 34 to 70 weeks in one production cycle. Cash inflows were obtained from two production cycles of broiler production (Table 6). On the other hand, layer enterprise provided cash inflows from two streams: eggs and sales of spent hens. It was evident that layer production commanded high cash inflow in the second year compared to the first year. This could be attributed to the fact that the layer enterprise generated the revenue from egg production in the first period, while the revenue in the second period comprised eggs and culled hen sales (Table 5). Since the layer enterprise is more attractive in terms of economic profitability than the broiler enterprise in Osun State, this could be seen as a possible explanation as to why small-scale producers prefer investing in layers than in broilers. Farmers only engage in small-scale broiler enterprises because of the quick cash inflow, lower initial investment, cash outlay and lower feed cost per production cycle. However, a daily income is preferred from layer to broiler enterprise when the hens are due for laying eggs. These findings contradict Mwansa (2013) who claimed that the

small-scale broiler enterprise was found to be more attractive for investment than the small-scale layer enterprise as indicated by the results of the NPVs and IRRs. This was the scenario in Zambia, which contradicted the results obtained from Nigeria. However, both countries were built on different economic frameworks such as interest rate, inflation rate, openness, marketing of poultry products and exchange rate.

Conclusion

In general terms, the study has indicated that there are greater potentials for improvement in small-scale broiler and layer enterprises in the study area. It was concluded that small-scale layer enterprises require higher start-up capital investment as well as running capital compared to the small-scale broiler enterprises. Moreover, in terms of returns, layer enterprises promise high percentages of returns with a reasonable return on investment compared to broiler enterprises. However, the production of broilers at the small-scale level tends to exhibit higher short-run return compared to layer production. Furthermore, net present worth for small-scale broiler enterprises was lesser than for small-scale layer enterprises. The total cost involved in layer production was relatively higher compared to broiler production, although in the long run layers yield higher returns than broilers. The cost of feeding was the major component of variable costs for both broilers and layers. The cost of feeding constituted more than the average of total production cost for the layer enterprise and about the average for the broiler enterprise. Given all these, the small-scale layer enterprise is more economically profitable compared to the small-scale broiler enterprise in terms of NPV, IRR and discounted payback period.

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UPOREDNA INVESTICIONA ANALIZA ZA MALE PROIZVOĐAČE
BROJLERA I JAJA U DRŽAVI OSUN, NIGERIJA

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R e z i m e

Ovom studijom se istražuju struktura ulaganja, troškovi i struktura primanja kod proizvodnje jaja i brojlera u Državi Osun u Nigeriji. Upoređuje se takođe njihova neto sadašnja vrednost u ispitivanoj oblasti, kako bi se utvrdili efekti investiranja. Za odabir ispitanika za istraživanje korišćena je tehnika višefaznog uzorkovanja. Primarni podaci su prikupljeni sa 180 farmi za proizvodnju brojlera i jaja, obuhvatajući 90 farmi brojlera i 90 farmi za proizvodnju jaja iz šest lokalnih samouprava u Državi Osun korišćenjem strukturiranog upitnika. Podaci su analizirani korišćenjem deskriptivne statistike, metoda kalkulacija i metoda za ocenu investicija. Obračun ulaganja je pokazao da je veća količina novca uložena u osnovna sredstva kod malih proizvođača jaja (₦651.274,5) nego kod proizvođača brojlera (₦448.068,6). Lična štednja je bila glavni izvor finansiranja kod malih proizvođača jaja u poređenju sa proizvođačima brojlera. Pored toga, mogućnost reinvestiranja kod proizvođača jaja uglavnom zavisi od sredstava članova porodice, dok kod proizvodnje brojlera zavisi od akumulacije. Kalkulacije po varijabilnim troškovima su pokazale da je bruto marža poljoprivrednika ₦166.321,8 odnosno ₦1.150.470,8 za proizvodnju brojlera odnosno jaja. Investiciona analiza je pokazala da proizvodnja jaja ima višu pozitivnu neto sadašnju vrednost (engl. *net present value – NPV*) i vrednost interne stope rentabilnosti (engl. *internal rate of return – IRR*) od ₦1.523.692,6 odnosno 64,9%. Nasuprot tome, proizvodnja brojlera imala je niže pozitivne vrednosti *NPV* i *IRR* od ₦961.173,3 odnosno 63,0%. Istraživanjem se zaključuje da je proizvodnja jaja kod malih proizvođača ekonomski isplativija u poređenju sa proizvodnjom brojlera sa višim vrednostima *NPV* i *IRR* i kraćim dinamičkim rokom povraćaja u Državi Osun.

Ključne reči: brojleri, nosilje, *NPV*, *IRR*, dinamički rok povraćaja.

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