

Analysis of financial feasibility of open house system for broiler chicken farming in Bulukumba Regency

Handayani Indah Susanti*

Department of Animal Science, Faculty of Science and Technology, Universitas Islam Negeri Alauddin Makassar, 92113, Indonesia.

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*Correspondence:

Corresponding author: Handayani Indah Susanti
E-mail: handayani.indah@uin-alauddin.ac.id

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ABSTRACT

This study aimed to analyze the financial feasibility of broiler chicken farming using the open house system in Bulukumba Regency, South Sulawesi. The research focused on 94 partner farmers distributed across Ujungloe, Herlang, and Rilau Ale districts, who were selected using purposive sampling based on their active participation in cattle farming and partnership schemes. The novelty of this study lies in its regional and empirical specificity by comprehensively examining the cost structure and profitability of broiler farming under real-world partnership models. The research applied descriptive quantitative analysis to determine cost components, revenue, income, Breakeven Point (BEP), Revenue-Cost Ratio (R/C), and Benefit-Cost Ratio (B/C). The results showed that the average production cost per cycle was IDR 428,500,000 with a total revenue of IDR 468,750,000, resulting in a net income of IDR 40,250,000. The R/C ratio was 1.09 and the B/C ratio was 0.094, indicating that broiler farming using the open house system is financially viable and profitable for farmers in the study area. To enhance financial sustainability, farmers are recommended to improve cost efficiency through optimized feed management, adopt better health and biosecurity practices to reduce mortality, and strengthen market linkages to ensure stable selling prices. Additionally, scaling up production and adopting technological innovations could further increase profitability and competitiveness in the long term.

Introduction

The raising of broiler chickens has been a major contributor to Indonesia's rural economy and national food security. Over the past decade, demand for broiler meat has continued to increase as a relatively affordable source of animal protein (Abdullah *et al.*, 2019; Zulkarnain *et al.*, 2019). Broiler farming provided employment opportunities for rural households and generated rapid returns on investment due to its relatively short production cycle of around 30 to 40 days (Singh *et al.*, 2024).

The open house method continues to be the most popular among production systems, particularly in small and medium-sized businesses. This technique is easy to adopt in rural areas and requires less financial expenditure (Sari *et al.*, 2021). However, flock performance and productivity are frequently impacted by environmental exposure and an uncontrolled temperature (Quintana-Ospina *et al.*, 2023). On the other hand, despite their superior technology, closed house systems are more expensive and frequently only available to major integrators (Ismiyah, 2021).

Partnership programs for broiler farming have become a practical way to help independent farmers by giving them access to market assurance, technical assistance, and inputs. However, there aren't many empirical research on the financial feasibility of these systems in certain areas, especially when they're open house (Armelia and Setianto, 2022). In Bulukumba Regency, South Sulawesi, broiler production is a significant livelihood activity because it contributed to household income, created employment opportunities, and played an important role in meeting the local demand for chicken meat, but comprehensive financial assessments are lacking. This indicates that although broiler farming has become an important source of income for the community, in-depth studies on the financial aspects of partnership systems, particularly under open house conditions, remain scarce. Few studies have systematically calculated and analyzed production costs, profit margins, financial risks, and the long-term sustainability of the business. The absence of such comprehensive

financial assessments makes it difficult for farmers, investors, and policymakers to fully understand the economic efficiency of broiler farming, design effective development strategies, and minimize potential financial losses. Therefore, further research focusing on financial feasibility analysis is essential to provide a strong foundation for decision-making and to support the sustainable development of the poultry sector in the region.

Decision-making and policy development at the farm level require an understanding of the cost structure and profitability of broiler production. To assess the feasibility of a livestock business, financial indicators such as the Breakeven Point (BEP), Revenue to Cost Ratio (R/C), and Benefit to Cost Ratio (B/C) are crucial (Rifqi *et al.*, 2024). This study contributed to the literature by presenting a financial analysis of broiler farming using the open house system in the context of partnerships. The research was expected to generate evidence-based recommendations to enhance the sustainability and profitability of broiler businesses. The urgency of this research lay in the need to understand the economic dynamics of broiler farming in Bulukumba Regency, South Sulawesi, as one of the poultry production centers that faced challenges such as fluctuating production costs, limited market access, and dependency on partnership systems. Therefore, the findings of this study provided a strong foundation for policymaking and strategies to improve the competitiveness of farmers in the region.

Materials and methods

This study was conducted in Bulukumba Regency, South Sulawesi Province, Indonesia, specifically in the districts of Ujungloe, Herlang, and Rilau Ale. These locations were purposively selected due to the high concentration of broiler farming operations that employed the open house system, which made the area one of the potential centers of broiler production. The total number of respondents in this study was 94 broiler farmers, all of whom were engaged in partnership-based production sys-

tems, with the sample determined using a census approach.

In the context of this study, partnership-based production systems were defined as a form of collaboration between farmers (plasma) and integrator companies (core). The integrator was responsible for providing essential production inputs such as day-old chicks (DOC), feed, medicines, and technical assistance, while plasma farmers provided housing facilities, labor, and managed daily farm operations. The harvested broilers were then marketed back to the integrator company under predetermined contracts or pricing agreements. This mechanism not only ensured the availability of production inputs and market access for farmers but also helped reduce production and marketing risks. Nevertheless, such partnership schemes also created high dependency on the integrator, which could weaken the bargaining power of farmers. This condition made the analysis of financial feasibility an important aspect to understand the prospects and sustainability of broiler farming enterprises in the study area.

To determine the financial feasibility of broiler chicken farming under the open house system, this study employed a descriptive quantitative approach supported by financial analysis models that were widely used in agricultural economics. The analytical process included the identification of fixed and variable costs, the calculation of revenues, the assessment of net income, and the evaluation of the financial soundness of the farming activities using feasibility indicators such as the Breakeven Point (BEP), Revenue Cost Ratio (R/C), and Benefit Cost Ratio (B/C). This approach was chosen because these indicators had been empirically proven to provide a comprehensive understanding of efficiency, profitability, and risk levels in livestock agribusiness (Geo *et al.*, 2020). Thus, the analysis not only assessed the ability of the farming enterprises to cover costs but also measured the extent to which they could generate sustainable profits.

These parameters are helpful in figuring out if the company makes money, breaks even, or loses money. To assess the size of revenues and overall costs incurred within a single manufacturing cycle, a profitability analysis was carried out. Additionally, the R/C and B/C ratios provide clear insights into the financial viability of the company, and BEP analysis aids in determining the production level necessary for cost recovery. The formulas used in this analysis are as follows:

Total Cost

$$TC = TFC + TVC \quad (1)$$

Where

TC = Total cost (IDR/period)

FC = Total Fixed Costs (depreciation of buildings and equipment)

VC = Total Variable Costs (DOC, feed, vaccines, labor, electricity, etc.)

Revenue (TR)

$$TR = Q \times P \quad (2)$$

Where

TR = Total revenue (IDR/period)

Q = Quantity of broiler output (kg/period)

P = Price per kilogram (IDR/kg)

Net Income (π)

$$\pi = TR - TC \quad (3)$$

Where

π = Net income (IDR/period)

TR = Total revenue

TC = Total cost

Breakeven Point (BEP)

BEP in Units (kg)

$$BEP_u = TFC / P - AVC \quad (4)$$

BEP in Price (IDR/kg):

$$BEP_p = TFC / Q + AVC \quad (5)$$

Where

BEP = Breakeven point in units or price

AVC = Average variable cost per unit

P = Selling price per unit

Q = Quantity produced

Feasibility Ratios

Revenue to Cost Ratio (R/C)

$$R/C = TR / TC \quad (6)$$

If $R/C > 1$, the business is profitable, $R/C < 1$ indicates loss.

Benefit-Cost Ratio (B/C)

$$B/C = TR - TC / TC \quad (7)$$

If $B/C > 0$, the business yields a net benefit, $B/C < 0$ indicates not feasible.

In agricultural economics, these indicators are frequently employed to assess the sustainability and financial success of farm businesses (Wijoyo *et al.*, 2024). Microsoft Excel 2010 was used to process and analyze all the data. To shed light on the profitability and cost effectiveness of broiler production in Bulukumba using the open house approach, the results were tabulated and descriptively evaluated.

Results

The economic viability of broiler chicken farming in Bulukumba Regency is assessed through the analysis of cost structure, revenue, net income, breakeven point (BEP), and profitability ratios such as R/C and B/C. The analysis reflects the operational dynamics of the open house system under partnership schemes.

The breakdown of average cost components is presented in Table 1. Table 2 highlights the financial returns of the farming operation. The total revenue (TR) per cycle was IDR 468,750,000, while the total production cost was IDR 428,500,000. This yielded a net income of IDR 40,250,000 per cycle. The R/C ratio was 1.09 and the B/C ratio was 0.094. In Table 3, the breakeven analysis shows that production surpassed the minimum thresholds for profit. The BEP unit was calculated at 23,805 kg, while actual average production was 25,000 kg.

Table 1. Average Total Cost Structure per Production Cycle.

Cost Component	Amount (IDR)	Percentage (%)
Feed	308,000,000	71.9
DOC (Day Old Chick)	64,275,000	15
Vaccines & Medicine	21,425,000	5
Labor	12,000,000	2.8
Electricity & Bedding	11,000,000	2.6
Depreciation (Fixed)	11,800,000	2.7
Total Cost (TC)	428,500,000	100

Table 2. Revenue and income analysis.

Indicator	Value (IDR)
Total Revenue (TR)	468,750,000
Total Cost (TC)	428,500,000
Net Income (π)	40,250,000
R/C Ratio	1.09
B/C Ratio	0.09

In this study, integrators referred to core companies that acted as the main suppliers and coordinators within the partnership scheme. These integrators provided essential production inputs such as day-old chicks (DOC), feed, medicines, and technical guidance to the broiler farmers (plasma). The partnership scheme worked as a contractual arrangement: the integrators supplied inputs and ensured marketing for harvested

broilers, while the farmers were responsible for housing, labor, and daily farm management. This arrangement reduced risks for farmers related to input availability and market access, and it helped stabilize production costs and income. The key stakeholders in this partnership scheme included the broiler farmers (plasma), integrator companies (core), local cooperatives, and sometimes local government extension officers who provided technical support. In this study area, the integrators were predominantly private companies that managed supply chains and facilitated the marketing of broilers to larger markets. The findings also indicate that open house systems, while less technologically advanced compared to closed house systems, can remain profitable if managed efficiently. This includes optimal scheduling, proper disease control, and good litter management. However, the relatively modest B/C ratio suggests that profit margins are narrow, making the system vulnerable to cost spikes, particularly in feed prices. In conclusion, broiler farming using the open house system in Bulukumba Regency is financially viable. Cost control especially in feed and maintaining production levels above BEP are key to sustainability. These findings provide valuable insights for policy makers, farmer cooperatives, and agribusiness firms aiming to support scalable, smallholder poultry enterprises.

Table 3. Break-Even Point (BEP) Analysis

BEP Indicator	Value
BEP Unit (kg)	23,805
BEP Price (IDR/kg)	17,937
Average Selling Price	19,000
Average Production (kg)	25,000

Discussion

The findings of this study indicate that broiler farming using the open house system in Bulukumba Regency was financially viable, as evidenced by the R/C and B/C ratios that exceeded the critical thresholds for feasibility. The profitability analysis showed a positive net income of IDR 40,250,000 per production cycle, supported by an R/C ratio of 1.09 and a B/C ratio of 0.094. These figures demonstrate that revenues are sufficient to cover costs and generate a return, consistent with the benchmark of $R/C > 1$ and $B/C > 0$ used in agribusiness feasibility assessments (Setianto *et al.*, 2023). According to Wijoyo *et al.* (2024), an R/C ratio greater than 1 and a B/C ratio greater than zero indicates a viable and profitable farm.

One of the most critical components influencing profitability is feed cost, which constituted approximately 72% of the total production cost. This finding is consistent with previous studies (Pizolotto *et al.*, 2024), which identified feed price and efficiency as dominant factors in broiler production economics. Feed management, including ration formulation and feeding strategies, is thus central to improving overall margins.

In this study, feed dominated the cost structure, accounting for nearly 72% of total expenses. This aligns with (Adeyonu and Odozi, 2022), who emphasized that feed is the most significant cost factor in broiler operations. High feed cost sensitivity means that price changes directly affect profitability.

The BEP analysis strengthens the evidence of economic feasibility. With a BEP unit of 23,805 kg and actual average production of 25,000 kg per cycle, farmers are operating above the breakeven threshold. The BEP price of IDR 17,937 per kg is lower than the actual market selling price of IDR 19,000, further verifying the system's economic sustainability. This confirms that operations are running above breakeven and are financially healthy, consistent with Hayati (2019). These results align with Separman *et al.* (2020), who stressed that breakeven performance is a reliable predictor of production resilience in poultry systems.

The dominant share of feed in the cost structure underlines the im-

portance of feed conversion efficiency. Almeida *et al.* (2020)) emphasized that even minor improvements in feed efficiency can significantly enhance profit margins. Moreover, partnerships with integrators, as practiced in this study, play a crucial role in stabilizing input prices and guaranteeing market access factors that reduce income variability (Armelia and Setianto, 2022).

In terms of partnership dynamics, the study found that integrated farming models under contract agreements provided farmers with input guarantees (e.g., DOC, feed, vaccines) and assured marketing channels. This reduces production risk and income volatility, as highlighted by Karaman *et al.* (2023). Similar models have been shown to boost financial confidence and long-term participation in poultry agribusinesses.

Moreover, these results also underline the importance of technical capacity building for farmers. Despite the use of the open house system, which is more vulnerable to environmental fluctuations compared to closed house systems (Hasanah *et al.*, 2020), strategic management in feeding, vaccination, and hygiene can offset such disadvantages and lead to acceptable profitability levels.

Nevertheless, several challenges remain. The relatively low B/C ratio (0.094), while positive, suggests tight profit margins that could be vulnerable to price fluctuations or supply shocks. Future research should explore comparative sensitivity analysis between open and closed house systems, incorporating risk variables such as disease outbreaks, feed price inflation, and market disruptions. The findings of this study revealed that broiler farmers faced significant challenges related to production efficiency, market access, and limited technical knowledge. These constraints hindered the overall growth of the sector and highlighted the need for strategies that could strengthen farmers' capacity while improving farm performance. The results demonstrated that providing adequate training, enhancing access to quality inputs, and facilitating more transparent market linkages were critical in addressing these barriers.

Furthermore, the study showed that institutional support and collaborative programs played a vital role in empowering farmers to adopt better management practices and innovative technologies. Such interventions not only improved farm productivity but also contributed to greater sustainability within the broiler farming system. Ultimately, these contributions emphasized the importance of farmer-oriented policies and development initiatives in fostering a more resilient and competitive broiler industry. In conclusion, this study not only confirms the viability of broiler farming under open house conditions but also highlights key levers for improving profitability particularly feed cost efficiency, scale of production, and strengthened partnerships. It contributes to the growing body of literature that supports evidence-based policy and investment in small to medium scale poultry systems in developing regions. In line with this, the study recommended the need for strengthening sustainable policy support, improving farmers access to technological innovations, particularly more efficient feed technologies, as well as facilitating access to financial resources to encourage business scale expansion. In addition, the development of more equitable and mutually beneficial partnership models between farmers, integrator companies, and other stakeholders was considered an important aspect in enhancing the competitiveness of smallholder poultry enterprises. Policy interventions that were responsive to the specific needs of the small and medium scale poultry sector also needed to be continuously promoted in order to create a more conducive, competitive, and sustainable business environment. Thus, the findings of this study served as an important reference for formulating development strategies for the poultry sector that were more inclusive, adaptive, and based on proven best practices.

Conclusion

This study concludes that broiler chicken farming using the open house system in Bulukumba Regency is financially feasible and provides positive economic returns to farmers, with an average R/C ratio of 1.09

and a B/C ratio of 0.09. The dominance of variable costs, particularly feed and day old chicks (DOC), highlights the importance of efficient input management in maintaining profitability. To ensure long term financial sustainability, farmers should consistently monitor cost structures, adapt to fluctuations in input and output markets, optimize feed utilization, implement better health and biosecurity practices to reduce mortality rates, and strengthen marketing networks to secure stable selling prices. Furthermore, scaling up production and adopting technological innovations are essential strategies to enhance profitability, resilience, and competitiveness of broiler farming in the future.

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Conflict of interest

The authors declare no conflict of interest related to the publication of this article.

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