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Research Article

Financial Analysis of Intensive *Kamang* Duck Farming Through R/C Ratio Analysis

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ABSTRACT

The Kamang Duck is a local livestock breed from West Sumatra, originating from the Kamang region in West Sumatra. Kamang ducks can produce quality eggs and tender meat, contributing to Indonesia's food security. Duck farming is one of the livestock sectors with significant development potential, especially in Indonesia, where poultry meat consumption is high. To optimize farming ventures, financial analysis is a crucial aspect for evaluating profitability, efficiency, and business to develop duck farming. The research was conducted at Dapur Bundo N-3 in Nagari Kamang, Agam Regency, using a survey method presented descriptively in tables and figures. The study aims to determine the financial value of Kamang duck farming by analyzing costs, revenues, income, and the R/C ratio. The R/C ratio result of 1.53 indicates that, with a value greater than 1, this meat duck farming business is feasible. A hybrid duck farming business with an R/C ratio over 1 is suitable for further development. The BEP (Break-Even Point) production value of 72.06 kg indicates the level of production at which the meat duck farming operation breaks even, with no profit or loss. This is a crucial metric for understanding the minimum production required to sustain the business. The study's actual production of meat ducks was 130 kg. The research conducted at Dapur Bundo N-3 on the Kamang duck business, with a stock of 100 ducks and a rearing period of seven (7) weeks from DOD (Day-Old Ducks), yielded the following results: total rearing cost of Rp 3,817,473, total revenue of Rp 5,850,000, and profit of Rp 2,032,527. The Kamang broiler duck farming business, on a scale of 100 ducks, is considered viable, with an R/C ratio of 1.53.

Keywords: analysis, financial, Kamang duck, income, revenue

INTRODUCTION

The Kamang Duck is a local livestock breed from West Sumatra, originating from the Kamang region in West Sumatra, Indonesia. It exhibits high adaptability to tropical environments and holds significant potential in poultry farming (Department of Agriculture, Agam Regency, 2024). Additionally, the Kamang Duck is known for its high productivity as a meat producer (Triani *et al.*, 2024). Furthermore, Suhaemi (2019) explains that Kamang Duck meat contains higher levels of HDL (good cholesterol), which enhances its quality. This makes Kamang Duck an attractive farming choice for poultry producers in West Sumatra.

The development of Kamang Duck farming began as a local effort in Kamang, Agam Regency, to create a duck breed that could thrive in diverse natural conditions while meeting the community's need for animal protein. With proper care, Kamang Ducks can produce quality eggs

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and tender meat, contributing to local food security. In terms of cultivation, Kamang Ducks require special attention in feed, housing, and health management. With proper care, Kamang Ducks can thrive and bring economic benefits to farmers.

Duck farming is one of the livestock sectors with significant development potential, especially in Indonesia, where poultry meat consumption is high. To optimize farming ventures, financial analysis is a crucial aspect for evaluating profitability, efficiency, and business growth potential (Mayulu *et al*., 2023). Financial analysis is the process of evaluating finances to assess the health and performance of a business. This analysis involves examining revenue, expenses, profits, and the investments needed for operations.

In the Kamang duck business, financial analysis is used to assess production costs, such as feed, maintenance, and labor costs, so that income from duck meat sales based on market prices can be calculated. Based on this information, financial strategies can be designed to improve efficiency and enable business expansion.

Cassava waste, especially its peels and residue, has great potential as a feed ingredient for ducks, as it contains sufficient energy. Utilizing cassava waste as duck feed can help reduce feed costs. Before being used as feed, cassava waste is typically fermented or dried to improve its nutritional value and reduce antinutritional components, such as cyanide (Moran *et al*., 2016). Fermentation also enhances its nutritional profile and extends its shelf life. Using cassava waste as feed helps farmers reduce agricultural waste and supports environmental conservation.

Fermented cassava waste can be used as feed ingredients in duck farming to substitute corn, thereby reducing feed costs and increasing profitability. Research has shown that cassava waste fermented with microbes can improve its quality as feed, enhance duck weight gain, and increase feed efficiency (Triani *et al*., 2024).

Given the adaptability, potential, and advantages of Kamang ducks, as well as the quality of their meat, it is essential to conduct a financial analysis of intensive Kamang duck farming. This research can reveal the financial value of Kamang broiler duck farming, including revenue, costs, income, R/C ratio, production breakeven point (BEP), and price BEP.

MATERIAL AND METHODS

The research method used was a survey with a descriptive approach, conducted at Dapur Bundo N-3 Farm in Nagari Kamang Mudiak, Agam Regency, West Sumatra. The primary goal of raising Kamang ducks at Dapur Bundo N-3 is to supply ducks for *itik lado hijau*, a traditional Minang dish specific to Agam Regency. Data collection was carried out over two months, from August to September 2024. The data collected included both primary and secondary data.

Primary data were obtained directly from Dapur Bundo N-3 Farm, consisting of revenue data from duck and manure sales (manure being sold as fertilizer), and cost data, which included fixed costs (depreciation of housing and equipment) and variable costs (purchase of ducklings, equipment, labor, and feed). Secondary data were gathered from various literature sources and documents from relevant institutions, such as feed ingredient and medication prices, market data, and the demand for duck meat.

The parameters observed in this study include costs, revenue, income, R/C ratio for the Kamang duck business, production breakeven point (BEP), and price BEP. The data analysis methods used in this study are:

1. Cost, Revenue, and Income Analysis

Total Cost

To determine the total cost incurred over one production cycle in broiler duck farming, a cost analysis calculation is used by summing the variable and fixed costs. According to Soekartawi (2002), total cost is defined as the sum of fixed and variable costs. Generally, it is formulated as follows:

$$TC = FC+VCTC = FC + VCTC = FC+VC$$

Description:
TC = Total Cost
FC = Fixed Cost
VC = Variable Cost

Revenue

According to Boediono (2002), revenue refers to the income generated from the sale of output. Total revenue can be determined by multiplying the output or production result by the selling price of the output. Mathematically, this can be expressed as follows:

To determine the revenue earned by duck meat producers, the formula can be written as:

$$TR = P \times Q$$

Description:
TR = Total Revenue
P = Price (selling price)
Q = Quantity (production output)

Income

To determine whether a farming business is profitable, whether in cultivation or processing activities, an income analysis is conducted. The income earned by duck meat producers can be calculated using the formula according to Soekartawi (2006) as follows:

$$\Pi = TR - TC$$

Description:
Π = Income
TR = Total Revenue
TC = Total Cost

2. Analysis of R/C Ratio and Break-Event Point (BEP)

R/C Ratio

To assess the comparison between total revenue and total cost, the R/C ratio can be formulated as follows:

$$R/C=TRTC\text{R/C} = \frac{\text{TR}}{\text{TC}}R/C=TCTR$$

Description:
TR = Total Revenue (total income)
TC = Total Cost (total expenses)
Calculation Criteria:

1. If R/C ≥ 1, then the broiler duck farming business is considered viable and profitable.
2. If R/C ≤ 1, then the broiler duck farming business is not yet viable and is unprofitable.
3. If R/C = 1, then the broiler duck farming business breaks even.

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Break-Event Point (BEP)

BEP (Break-Even Point) represents the financial breakeven in farming operations. In this calculation, there are two types of BEP: price BEP and production BEP. To determine if the layer duck farming business is profitable, at a loss, or at breakeven, the following formula can be used. The variables required for BEP analysis include fixed costs, variable costs, sales price, and quantity sold (total production). The formula used is as follows (Prawirokusumo, 2000):

$$BEP\ Price = \frac{\text{Production Cost}}{\text{Total Production}}$$

$$BEP\ Production = \frac{\text{Production Cost}}{\text{Selling Price}}$$

RESULTS AND DISCUSSION

Analysis of Cost, Revenue, and Income

Broiler ducks are raised from DOD (Day-Old Ducklings) to seven weeks of age. This analysis aims to assess whether the broiler duck farming business is profitable by examining three aspects: costs, revenue, and income. Below are the costs, revenue, and income associated with the broiler duck farming business at Dapur Bundo N-3 over a seven-week maintenance period.

Cost

Costs represent the sacrifice of economic resources measured in monetary units, used to acquire goods or services. In business and accounting, costs include expenses incurred by a company to achieve specific goals, whether in production, distribution, marketing, or administration. Costs may also encompass the value of resources sacrificed to sustain business continuity. Production costs comprise the sum of two types of costs in the production process: fixed costs and variable costs over a seven-week period, expressed in rupiah.

Fixed Costs are types of costs that remain constant over a specific period, regardless of changes in production volume or company activity. This means that fixed costs are not influenced by the quantity of goods or services produced. These costs are typically essential expenses that must be incurred to keep the business operational. In the broiler duck farming business at Dapur Bundo N-3, Kamang District, Agam Regency, fixed costs incurred by farmers include depreciation on housing and equipment. The average depreciation costs for housing and equipment over the production period are shown in the following table:

Table 1. Components of the cost of Kamang ducks for 7 weeks for 100 ducks

Description	Amount (Rp)	Percentage (%)
A. Fixed Costs		
Depreciation of housing	67,125	1.73
Depreciation of equipment	3,045	0.07
B. Variable Costs		
Purchase of DOD	600,000	15.00
Feed	2,589,303	66.88
Equipment	68,000	1.76
Labor	490,000	12.66
Total	3,871,473	

In this study, the housing, feeding, and drinking equipment were made from simple materials without sacrificing the essential functions of the housing. It serves as a comfortable space for production and protects the ducks from predators. The depreciation cost for the housing amounted to Rp 67,125 or 1.73% of the total cost, while the depreciation for feeding and drinking equipment was Rp 3,045, equivalent to 0.07%. Proper housing is crucial in maintaining the health and productivity of Kamang ducks. Depreciation costs for housing and equipment are categorized as fixed costs. With proper housing management, ducks are protected from stress, diseases, and conditions that could reduce egg productivity and meat quality. Farmers should pay attention to every aspect of housing, such as ventilation, lighting, cleanliness, and security, to ensure optimal Kamang duck farming.

Variable costs are those that fluctuate based on the level of production or business activity. In other words, the higher the production volume or sales, the higher the variable costs, and vice versa. Variable costs are directly proportional to output, as they are tied directly to the production or sale of goods and services. For Kamang duck farming, variable costs depend on the number of ducks raised. Table 1 lists variable costs, including ducklings, feed, equipment, and labor. The cost for 100 ducklings (DOD) is Rp 600,000, or 15% of the total cost.

Selecting appropriate feed can help farmers reduce production costs. Providing feed with the right nutritional content minimizes waste, as the ducks can fully utilize the nutrients, thus enhancing productivity. Conversely, inadequate feed may hinder optimal duck growth, requiring more time and expense to reach production targets.

The feed cost percentage in duck farming is typically high, as feed is a primary component essential for supporting duck growth and productivity, whether for egg or meat production. Generally, feed costs in duck farming can account for 60-70% of total operational expenses. Quality feed is vital to achieve the ideal weight in a shorter period. In this study, the feed cost percentage for meat production was 66.88%, which is 1.88% above the lower threshold of the total production cost. This relatively low percentage was achieved by using self-produced feed from fermented cassava waste. Feed should be both high-quality and affordable for farmers. Alternatives, such as utilizing nutrient-rich agricultural waste or local feed ingredients, can help lower feed costs.

For a scale of 100 meat ducks, Bundo N 3's operation used PVC pipes for feeding and drinking containers. Feeding and watering 100 ducks takes about an hour daily, with a labor cost of Rp 80,000 per day, resulting in a labor cost of Rp 490,000 for one hour of daily maintenance over seven weeks.

Revenue

Revenue represents all income or proceeds received by a company, organization, or individual from various activities, such as product or service sales, investments, or other activities. In a business context, revenue typically refers to gross income generated before deducting production or operational costs. Revenue is a key performance indicator for a company or economic entity. High revenue indicates that the business successfully attracts the market and generates stable or increasing income.

The revenue from meat duck farming reflects the monetary value received by farmers from the sale of ducks, along with the manure obtained during rearing. Revenue analysis in duck farming is determined by multiplying the quantity of production obtained by the selling price.

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Total production value over a specific period, whether sold or unsold, constitutes the revenue. The following outlines the revenue obtained in meat duck farming.

Table 2. Revenue from Kamang Duck Farming

Description	Price per kg (Rp)	Amount (Rp)
Revenue		
Sale of ducks (1.3 kg each)	40,000	5,200,000
Duck manure (650 kg)	1,000	650,000
Total		5,850,000

Income

Revenue is the total amount of money or economic return earned by an entity, whether an individual or organization, as a result of economic activities such as the sale of goods, services, or investments within a specific period. Revenue is a key element in the income statement that reflects a company's financial performance and serves as the foundation for assessing business profitability.

The revenue from meat duck farming represents the net result of a farming business, derived from total income minus the costs incurred in the production process. The following outlines the revenue generated in meat duck farming at Dapur Bundo N 3:

Table 3. Revenue from Meat Duck Farming for 100 Ducks

No.	Description	Amount (Rp)
1.	Income	
	Sale of meat ducks	5,200,000
	Duck manure	650,000
	Total Income (TR)	5,850,000
2.	Costs	
	A. Fixed Costs	
	Depreciation of housing	67,125
	Depreciation of equipment	3,045
	B. Variable Costs	
	Purchase of ducks	600,000
	Feed	2,589,303
	Equipment	68,000
	Labor	490,000
	Total Costs (TC)	3,817,473
	Revenue (TR-TC)	2,032,527

Based on Table 3, if scaled to 500 ducks, a duck farming business would generate a total income of Rp 10,165,635 over the seven-week rearing period.

Analysis of R/C Ratio, Break-Even Point (BEP), and Return on Investment (ROI)

R/C Ratio

The R/C Ratio is the ratio of sales revenue to the costs incurred throughout the production process to generate the product. This ratio indicates the amount of revenue obtained for each rupiah of cost spent, as shown in the following equation:

$$\begin{aligned} \text{R/C Ratio} &= \text{TR/TC} \\ &= 5{,}850{,}000/3{,}817{,}473 \\ &= 1.53 \end{aligned}$$

The R/C ratio result of 1.53 indicates that, with a value greater than 1, this meat duck farming business is feasible. This finding aligns with Tenrisana *et al*. (2021), who stated that a hybrid duck farming business with an R/C ratio over 1 is suitable for further development. The R/C ratio in this study is also higher than the result found by Lembong (2015), cited in Hastuti (2018), who reported an R/C ratio of 1.19 for hybrid meat duck farming.

Break-Event Point (BEP)

The BEP analysis determines the break-even level of sales or production where no profit or loss is realized, calculated in terms of rupiah. There are two types in this calculation, i.e. BEP production and BEP price.

BEP Production

$$\begin{aligned} \text{BEP Production} &= \frac{\text{Production Cost}}{\text{Selling Price}} \\ &= \frac{3{,}817{,}473}{52{,}000} \\ &= 72.06 \text{ kg} \end{aligned}$$

The BEP production value of 72.06 kg indicates that at this production level, the meat duck farming operation breaks even, with no profit or loss. The study's actual production of meat ducks was 130 kg.

BEP Price

$$\begin{aligned} \text{BEP Price} &= \frac{\text{Production Cost}}{\text{Total Production}} \\ &= \frac{3{,}817{,}473}{130} \\ &= 29{,}365 \end{aligned}$$

The BEP price of Rp 29,365 indicates the minimum selling price per kilogram needed to cover the total production costs.

Comparison of financing percentage for Kamang ducks as shown in Figure 1. Figure 1 illustrates that feed costs constitute the largest expense component in the intensive duck farming system in Kamang, accounting for 68% of the total costs. Based on this observation, the success and profitability of the enterprise heavily depend on feed costs. Feed manipulation using unconventional feed ingredients can reduce feed expenses. The feed cost component in this farm

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is lower compared to the feed costs in duck farming systems utilizing conventional feed, which can reach up to 73% (Triani *et al*., 2024).

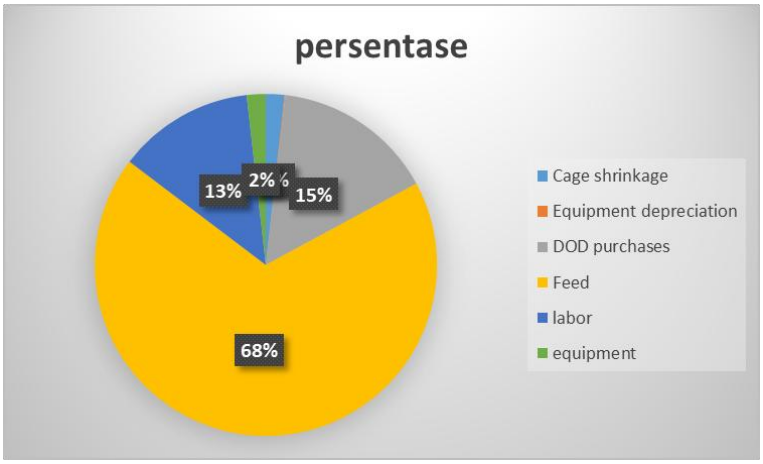


Figure 1. Comparison of Financing Percentage for Kamang Ducks

CONCLUSION

The research conducted at Dapur Bundo N-3 farm on the Kamang broiler duck business, with a stock of 100 ducks and a rearing period of seven weeks from DOD (Day-Old Ducks), yielded the following results: total rearing cost of Rp 3,817,473, total revenue of Rp 5,850,000, and profit of Rp 2,032,527. The Kamang broiler duck farming business on a scale of 100 ducks is considered viable, with an R/C ratio of 1.53.

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