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Economic Feasibility Analysis of Shredded Meat (Abon) from Muscovy Duck (*Cairina moschata*)

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ABSTRACT

This study aimed to analyze the economic feasibility of producing shredded muscovy duck meat (abon) as a value-added product for small-scale agroindustry. The production process yielded 60 pouches (50 g each) per batch, with a total production cost of Rp 876,933.3 and a cost of goods sold (COGS) of Rp 14,615 per pouch. The product was marketed at a selling price of Rp 21,923 per pouch, reflecting a 50% profit margin. Economic analysis revealed a break-even point (BEP) of 40 pouches or equivalent to Rp 876,920 in revenue, indicating that the business achieves profitability at a relatively low sales threshold. The revenue-cost ratio (R/C ratio) was 1.49, suggesting financial efficiency, as every 1 rupiah spent on production generates 1.49 rupiah in revenue. However, the benefit-cost ratio (B/C ratio) was 0.50, implying that while the venture is profitable, its profit margin remains modest. These findings highlight that shredded muscovy duck meat (abon) production is economically viable and holds significant potential for micro, small, and medium enterprises (MSMEs), particularly with optimization of production scale and cost efficiency strategies.

INTRODUCTION

The muscovy duck (*Cairina moschata*), a domesticated waterfowl originating from Central America, has been widely cultivated in traditional farming systems in Indonesia. Farmers primarily raise muscovy ducks for their meat, as these ducks have a relatively high body weight compared to chickens and other duck species. Male muscovy ducks can reach an average weight of 5.0–5.5 kg, while females weigh approximately 2.5–3.0 kg. The muscovy duck population in East Java reached 1.2 million (Badan Pusat Statistik, 2025)contributing 18% to local poultry meat production. At the national level, the muscovy duck population increased by 3.7% in 2019; however, its productivity remains suboptimal (Lase & Lestari, 2020).

Muscovy duck meat is nutritionally superior, making it a promising raw material for processed food products. A 100 g serving of duck meat contains approximately 22% of protein and its fat content is relatively low (6–8%), lower than that of other duck meats (12–15%) (Anas et al., 2019; Tasirin et al., 2025). Unlike other duck meats, muscovy duck meat is not greasy; it resembles veal with lean muscle fibers and a unique, savory flavor (da Silva Costa et al., 2023). These characteristics suggest strong potential for muscovy duck meat as a healthy, value-added food product to cater to nutrition-conscious consumers.

Currently, the utilization of muscovy duck meat in the food processing industry remains limited. In Indonesia, common preparations such as grilled duck (entok bakar), duck curry (gulai entok), duck satay (sate entok), and fried duck (entok goreng), are typically consumed immediately after cooking and thus have a short shelf life. Raw poultry meat stored at ambient temperature remains safe for only 1–2 days, whereas refrigerated storage at approximately 4 °C extends shelf life up to 5–7 days, after which spoilage becomes significant (Lui & Brown, 2025). Therefore, processing into shelf-stable products is necessary to extend its marketability and value.

One such product is abon, a traditional Indonesian shredded meat product made by boiling and shredding meat, seasoning it with spices, and pan-frying it until dry. Although beef and buffalo meat are commonly used, other types of meat, including fish and pigeon have also been utilized in abon production (Karnita et al., 2024). The shelf life of abon product when stored at temperatures of 25, 27, and 30°C is 515.34, 489.49, and 458.14 days, respectively (Yuwono et al., 2023).

Economic analysis of muscovy duck abon production is crucial to assess its viability and profit potential. Processed meat-based agroindustries, such as abon, have been shown to provide significant added value for micro and small-scale entrepreneurs. For instance, tuna abon enterprises in Bontang reported R/C ratios ranging from 1.23 to 1.58 (average 1.41), indicating efficiency and profitability us(Abdusysyahid et al., 2021). Similarly, a tuna abon business in Pangandaran Regency achieved an R/C ratio of 1.47, demonstrating the venture's feasibility(Rustandy et al., 2023). In addition, benefit-cost ratio (B/C) analysis can provide a comprehensive view of economic feasibility. A study on agroindustry fish abon in Tanjung Karang, Mataram, generated value 1.3 in benefits/costs ratio, making the enterprise financially viable(Hidayat et al., 2018).

Economic analysis is not only useful for assessing feasibility but also for helping entrepreneurs understand the relationship between production costs, selling prices, and sales volumes needed to reach the break-even point (BEP). This knowledge allows for more effective production and marketing strategies to maximize profits. It also provides insight into business risks and sensitivity to changes in raw material prices and product selling prices, enabling more informed investment decisions.

By conducting an economic analysis, the development of muscovy duck abon can contribute to enhancing the value of local products and strengthening the competitiveness of poultry-based food processing industries at the micro, small, and medium enterprise (MSME) level and beyond. This study aims to analyze the economic feasibility of muscovy duck abon production and to assess its potential as a value-added product for supporting agroindustry development.

MATERIALS AND METHODS

This was a quantitative research using an economic analysis approach to evaluate production costs, revenue, and profitability of shredded muscovy duck (*Cairina moschata*) meat (abon). The study focused on numerical data collection and statistical calculations to determine cost efficiency and economic feasibility. This study was conducted in April–June 2025 at the Meat Processing Laboratory, State Community College of Putra Sang Fajar Blitar, Indonesia. Primary data were collected through direct observation of the production process and experimental documentation of all cost components involved in abon production. Data collection was carried out systematically through:

a. Direct observation of the production process of muscovy duck abon.
b. Recording all production cost components, including raw materials, labor, energy, and packaging.
c. Documenting financial inputs and outputs from the production process.
d. Analyzing production cost and revenue data to assess economic feasibility.

The economic analysis included the following variables:

a. Cost of Goods Sold (COGS)
b. Break-Even Point (BEP)
c. Revenue-Cost Ratio (R/C)
d. Benefit-Cost Ratio (B/C)

These indicators were used to assess the efficiency and profitability of muscovy duck abon production.

RESULTS AND DISCUSSION

a. Fixed cost

Fixed costs represent routine weekly expenses incurred regardless of production volume. These costs were calculated based on the depreciation of equipment over its economic lifespan, assumed to be five years (240 weeks) for major tools such as pressure cookers, non-stick pans, mixing bowls, meat pounders, digital scales, and work-tables. Supporting tools like large knives, small knives, plastic measuring cups, and serving plates were assumed to have a one-year (48 weeks) economic lifespan. The total fixed cost for one production cycle of muscovy duck shredded meat (abon) was IDR 14,833.3 (Table 1). This reflects the proportion of equipment depreciation that must be allocated weekly to ensure the continuity of production.

b. Variable cost

Variable costs fluctuate according to production volume and primarily consist of raw materials and consumables. For producing 60 pouches of abon (each weighing 50 g), the total variable cost amounted to IDR 862,100 (Table 2). The largest portion of variable costs came from the raw duck meat, accounting for more than 60% of total variable expenses. This is consistent with findings by Triwidatin, (2022), who observed that raw materials typically contribute 65–75% of total production costs in processing businesses.

c. Total production cost and COGS

The total production cost, including fixed and variable components per bacth/weekly, was calculated at IDR 876,933.3 for one batch (60 pouches). The COGS was determined as:

Table 1. Fixed cost breakdown for muscovy duck abon

Component	Purchase Price (IDR)	Economic Lifespan	Weekly Depreciation (IDR)
Pressure cooker	250,000	240 weeks	1,041.66
Non-stick pan	190,000	240 weeks	791.66
Mixing bowls (4 pcs)	196,000	240 weeks	816.66
Meat pounder	69,000	240 weeks	287.50
Large digital scale	2,000,000	240 weeks	8,333.33
Small digital scale	30,000	240 weeks	125.00
Work table	500,000	240 weeks	2,083.33
Large meat knife	50,000	48 weeks	208.33
Small knife	25,000	48 weeks	520.83
Plastic measuring cup	11,000	48 weeks	229.16
Plastic plates (1 pack)	19,000	48 weeks	395.83
Total Fixed Costs	**3,340,000**		**14,833.3**

Table 2. Breakdown of variable costs for muscovy duck *abon per batch*

No	Ingredients/Components	Quantity Used	Unit Price (IDR)	Total Cost (IDR)
1	Muscovy duck	5 birds	150,000/bird	750,000
2	Shallots	225 grams	40,000/kg	9,000
3	Garlic	225 grams	40,000/kg	9,000
4	Candlenut	225 grams	30,000/kg	6,750
5	Turmeric	225 grams	25,000/kg	5,625
6	Galangal	225 grams	20,000/kg	4,500
7	Ginger	120 grams	25,000/kg	3,000
8	Lemongrass	30 stalks	15,000/kg	7,500
9	Ground coriander	90 grams	10,000/pack	6,030
10	Salt	60 grams	2,000/200 grams	600
11	Granulated sugar	150 grams	18,000/kg	2,700
12	Palm sugar	375 grams	6,500/380 grams	3,125
13	Cooking oil	675 mL	4,750/220 mL	14,575
14	Kaffir lime leaves	30 leaves	500/12 leaves	1,070
15	Bay leaves	45 leaves	500/12 leaves	1,875
16	LPG gas (fuel)	2,587.5 grams	20,000/3 kg	17,250
17	Sticker labels	60 pieces	8,500/65 pieces	7,800
18	Plastic pouches	60 pieces	19,500/100 pieces	11,700
	Total Variable Cost			**862,100**

$$COGS = \frac{Total\ Production\ Cost}{Total\ Units\ Produced}$$

$$= \frac{Fixed\ cost + Variable\ cost}{Total\ Units\ Produced}$$

$$= \frac{Rp\ 14{,}833.3 + Rp\ 862{,}100}{Total\ Units\ Produced}$$

$$= \frac{Rp\ 876{,}933.3}{60\ units}$$

$$= Rp\ 14{,}615.5\ per\ unit$$

This COGS is relatively low compared to beef abon reported by Kholikin et al. (2023), which had a COGS of IDR 19,800 per 50 g pouch. Thus, muscovy duck abon offers a cost advantage as a value-added product with comparable nutritional benefits.

d. Selling price

Each production batch yields 60 pouches (50 g per pouch). This weekly production scale was used as the reference in determining the cost of goods sold (COGS), selling price, and profitability metrics. The selling price was determined by adding a profit margin to the cost of goods sold (COGS) per pouch. Setting the appropriate selling price is crucial to ensure that producers obtain the desired profit. The formula used is as follows:

$$Selling\ price = COGS + (COGS\ x\ profit\ margin)$$

$$= Rp\ 14{,}615.5 + (Rp\ 14{,}615.5\ x\ 50\%)$$

$$= Rp\ 14{,}615.5 + Rp\ 7{,}307.5$$

$$= Rp\ 21{,}923$$

Thus, by applying a 50% profit margin, the selling price per 50 g pouch of shredded muscovy duck meat (abon) was set at IDR 21,923.This pricing strategy aims to cover production costs while providing a reasonable profit margin for small-scale producers. Similar pricing approaches were adopted by Smith & Birbeck (2012), in developing selling price, where profit margins ranged between 40–60%, depending on production scale and market segmentation. Such pricing is considered competitive for premium meat-based processed products, particularly those with attractive packaging and distinctive flavor quality.

e. Break-even point (BEP) in units

The break-even point (BEP) in units indicates the minimum number of products that must be sold to ensure that the business does not incur a loss. This calculation is essential to determine the production threshold required for financial sustainability. In this study, the selling price per pouch was set at IDR 21,923, and the cost of goods sold (COGS) per pouch was IDR 14,615.5. The profit per unit and BEP were calculated as follows:

$$BEP\ (units) = \frac{Total\ Fixed\ Cost}{Selling\ Price\ per\ Unit}$$

$$BEP\ (units) = \frac{Rp\ 876{,}933.3}{Rp\ 21{,}923}$$

$$BEP\ (units) = 40$$

This result shows that a minimum of 40 pouches of muscovy duck shredded meat (abon) must be sold to cover the total production costs and avoid losses. The analysis suggests that the BEP achieved in this study demonstrates a relatively high level of efficiency for small-scale production. Micro- and small-scale enterprises achieve lower break-even points when fixed and variable costs are minimized, and pricing strategies include reasonable profit margins (Oppusunggu, 2020). This aligns with the premise that reducing COGS and setting a fair selling price accelerates the path to profitability. Similarly, a study by Abdusysyahid et al (2021),on tuna abon in Bontang, Indonesia, found that the BEP ranged between 15–18 pouches per batch. These findings indicate that muscovy duck abon has strong potential for achieving cost-efficiency and profitability, particularly within small-scale agroindustrial settings.

f. Break-even point (BEP) in revenue

The break-even point (BEP) in revenue represents the minimum income required to fully cover production costs. It is calculated using the formula:

$$BEP\ revenue = BEP\ (units) x\ Selling\ Price\ per\ Unit$$

$$BEP\ revenue = 40\ x\ Rp\ 21{,}923$$

$$BEP\ revenue = Rp\ 876{,}920$$

This result indicates that the business will reach its break-even point when total sales revenue reaches IDR 876,920. Any sales beyond this threshold will generate net profit for the producer.

The analysis highlights that this BEP revenue level is relatively low and can feasibly be achieved within a single production cycle using basic marketing strategies. A similar study by Rustandy et al. (2023), on tuna abon reported the break-even point is 8 packs in one production process and the break-even point is IDR 20,404.76/pcs in one production. Compared to these findings, the BEP revenue for muscovy duck abon in the present study is relatively higher, suggesting greater flexibility for initial marketing, particularly for Micro, Small, Medium-Scale Enterprises (MSMEs).

g. Revenue-cost ratio (R/C)

The revenue-cost (R/C) ratio is used to evaluate the financial efficiency of a business by comparing total revenue with total production costs. An R/C ratio greater than 1 indicates that the enterprise is financially viable. The formula applied is as follows:

$$R/C\ ratio = \frac{Total\ Revenue}{Total\ Production\ Cost}$$

$$R/C\ ratio = \frac{Units\ Sold\ x\ Selling\ Price}{Total\ Production\ Cost}$$

$$R/C\ ratio = \frac{60\ x\ Rp\ 21{,}923}{Rp\ 876{,}933.3}$$

$$R/C\ ratio = \frac{Rp\ 1{,}315{,}380}{Rp\ 876{,}933.3}$$

$$R/C\ ratio = 1.49$$

This result indicates that for every 1 rupiah spent on production, the business generates 1.49 rupiah in revenue. Therefore, the production of muscovy duck shredded meat (abon) is economically feasible and profitable.

Nugroho & Mas'ud, (2021) stated that an R/C ratio ≥1.0 reflects a financially efficient and profitable venture. As a comparison, Abdusysyahid et al., (2021),reported R/C ratios ranging from 1.23 to 1.58 in tuna abon production, while Hidayat et al., (2018),recorded an R/C ratio of 1.61 in a similar meat-based product. Although the R/C ratio for muscovy duck abon in this study is slightly lower than some other agro-industrial ventures, it still demonstrates a positive financial outlook. The ratio can be further improved through production efficiency and increased sales volume.

h. Benefit-cost ratio (B/C)

The benefit-cost (B/C) ratio is an economic feasibility indicator that compares the total profit (benefit) to the total production cost (cost). It is calculated using the following formula:

$$B/C\ ratio = \frac{Total\ Profit}{Total\ Production\ Cost}$$

$$= \frac{Total\ Revenue - Total\ Production\ Cost}{Total\ Production\ Cost}$$

$$= \frac{Rp\ 1{,}315{,}395 - Rp\ 876{,}933.3}{Rp\ 876{,}933.3}$$

$$= \frac{Rp\ 1{,}315{,}395 - Rp\ 876{,}933.3}{Rp\ 876{,}933.3}$$

$$= \frac{Rp\ 438{,}461.7}{Rp\ 876{,}933.3}$$

$$= 0.50$$

This result indicates that for every 1 rupiah spent on production, the business generates a profit of 0.50 rupiah. Although the B/C ratio does not yet reach the ideal threshold of ≥1.0, which is commonly considered as the benchmark for optimal feasibility, the production of muscovy duck shredded meat (abon) still demonstrates potential profitability at a small scale.

According to Hidayat et al. (2018), enterprises with a B/C ratio below 1.0 can still be developed by improving production efficiency and increasing output volume. Similarly, Anggardha and Setiafindari (2023)

suggested that scaling up production capacity is an effective strategy to enhance the B/C ratio and overall business viability. Therefore, although the current B/C ratio is moderate, muscovy duck abon holds significant potential for economic feasibility if managed with appropriate production and marketing strategies.

CONCLUSIONS

Based on the findings of this study on the economic analysis of shredded Muscovy duck meat (abon), it can be concluded that the cost of production or cost of goods sold (COGS) for one 50 g pouch is IDR 14,615, with the total production cost for one batch amounting to IDR 876,933.3. The product is marketed at a selling price of IDR 21,923 per pouch, which reflects a 50% profit margin over the COGS.

Break-even analysis revealed that the business begins to generate profit when a minimum of 60 pouches are sold, equivalent to a revenue of Rp 876,920. The revenue-cost ratio (R/C ratio) of 1.49 indicates that the venture is financially viable and efficient, as every 1 rupiah spent on production yields 1.49 rupiah in revenue. Meanwhile, the benefit-cost ratio (B/C ratio) of 0.50 suggests that although the business is already profitable, the profit margin remains relatively modest and could be further improved through increased production scale and cost optimization strategies.

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