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Profitability and Feasibility Analysis of Traditional Beef Cattle Fattening Business: A Case Study of Blang Rimeh Farmers Group in Pidie Regency

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Abstract
Cattle fattening is an important livelihood for rural farmers in Indonesia, particularly in regions such as Pidie District, where small-scale livestock management contributes significantly to household income. However, limited capital, traditional management practices, and lack of economic feasibility information often hinder farmers from optimizing their productivity and profit. This study aims to analyze the profitability and feasibility of the cattle fattening business operated by the Blang Rimeh Farmers Group in Pulo Seunong Village, Tangse Subdistrict, Pidie Regency, as a basis for determining whether the business is viable for further development. The research was conducted from March to April 2024 using a survey approach with a census of all 11 group members as respondents. Data were collected through observation, interviews, and questionnaires. Profitability analysis was calculated using the income formula ($\pi = TR - TC$), while feasibility was assessed through the Revenue/Cost (R/C) ratio and Return on Investment (ROI). The cattle fattening activities were found to be traditional in scale, with each farmer raising an average of one head and relying solely on fresh forage without the use of concentrate supplementation. The analysis revealed an average income of IDR 2,096,061 per person per period, a return on capital (R/C) ratio of 1.11, and an ROI of 11%. These values suggest that, despite the simplicity of management practices, the business generates a positive return and provides significant financial benefits to farmers.The cattle fattening business in the Blang Rimeh Farmers Group is profitable and feasible to pursue. Strengthening feeding management, improving facilities, and enhancing technical knowledge may further increase productivity and profitability.

Keywords: Beef Cattle; Cattle Fattening; Feasibility Análisis; Profitability; Rural Farming.

Introduction

Indonesia's beef cattle sector plays a strategic role in food security, rural livelihoods, and the provision of high-quality animal protein, particularly in the form of red meat, at a time when global demand for beef continues to rise due to income growth, urbanization, and shifting dietary preferences toward animal-source foods (Greenwood, 2021). In Indonesia, per capita beef consumption has been increasing, yet domestic production still lags behind demand, so that a significant share of national needs must be met through imports of frozen beef and live cattle; recent statistics indicate that domestic production covers only around 60% of beef demand, with the remaining 40% supplied by imports (BPS, 2024; Widyaningrum et al., 2021). This structural

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deficit persists despite multiple government initiatives designed to expand the national cattle population and reduce import dependence, such as UPSUS SIWAB (Special Effort for Mandatory Pregnancy in Female Cattle) launched in 2017 and the SIKOMANDAN program (Cattle and Buffalo as National Strategic Commodities) introduced in 2020, which seek to accelerate reproduction and productivity in both beef and dairy herds (Maharani, 2019). Yet, recent analyses and expert reports emphasize that Indonesia has still not achieved beef self-sufficiency, pointing to constraints including land conversion that reduces natural forage resources, uneven program implementation across regions, and persistent reproductive disorders such as repeat breeding, which limit the growth and efficiency of the national herd (Kusumawati, 2021; Nazaruddin et al., 2025). Within this national context, smallholder farmers remain the backbone of Indonesia's beef production, typically operating mixed farming systems in which cattle are kept in small numbers, integrated with crops, and managed using family labor; such systems not only supply meat but also serve as savings, insurance, and sources of manure, thereby contributing substantially to rural household resilience and broader local development (Hilmiati et al., 2024; Mayulu et al., 2024). Aceh Province is an important example of a region where local cattle resources and traditional management practices are central to beef production: Aceh cattle have been formally recognized as one of Indonesia's indigenous beef cattle breeds and valuable local genetic resources, well adapted to harsh tropical conditions, low-quality feed, and disease pressure, and culturally embedded in the social and economic life of rural communities (Budisatria et al., 2019; Sutarno et al., 2015).

However, Aceh cattle are predominantly raised by smallholders under low-input, traditional systems, often with limited access to improved breeding stock, quality concentrates, veterinary services, and formal finance, which in turn constrains productivity, reproduction, and the ability of farmers to respond to rising market demand (Budisatria et al., 2019; Hilmiati et al., 2024). In parallel, a growing body of empirical work in Indonesia and other developing countries has examined the profitability and feasibility of beef cattle fattening enterprises, highlighting that such businesses can be economically viable when costs—especially for feed, health, and labor—are controlled and when farmers manage sufficient numbers of animals to exploit economies of scale; for example, recent farm-level studies in Balikpapan show that smallholder fattening operations can generate high net profit and strong net and gross profit margins over an annual cycle (Mayulu, et al., 2024; Mayulu, et al., 2024). These studies commonly rely on standard financial indicators such as income ($\pi = TR - TC$), Revenue–Cost (R/C) ratio, and profitability ratios (e.g., net and gross profit margins) to determine whether given cattle fattening enterprise is financially attractive and sustainable; an R/C ratio greater than one generally indicates business feasibility and the potential for continued operation and scaling.

At the same time, previous research tends to focus either on relatively larger, semi-commercial fattening units or on aggregated samples of smallholders across wide regions, with rearing periods of several months and ownership scales often exceeding two or more animals per farmer, frequently using combinations of forage and concentrate feeds. As a result, there is still very limited evidence on the micro-level economics of very small-scale, highly traditional fattening enterprises in Aceh—especially those in which farmers keep only one head of cattle, rely almost entirely on locally available cut-and-carry forage, use family labor, and treat cattle fattening primarily as a side activity rather than a main business. In this context, Pulo Seunong Village in Tangse Subdistrict, Pidie Regency, Aceh Province, where members of the Blang Rimeh Farmers Group typically raise a single beef animal in simple housing and feed it mainly with fresh forage from surrounding land, represents a distinctive yet representative case of such traditional smallholder beef fattening systems in Aceh.

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Therefore, this study aims to analyze the economic performance of smallholder beef cattle fattening in the Blang Rimeh Farmers Group in Pulo Seunong Village, Tangse Subdistrict, Pidie Regency, Aceh Province, by quantifying farmers' income, calculating the Revenue–Cost (R/C) ratio, and estimating the Return on Investment (ROI) associated with their current fattening practices, and accordingly the research problem addressed in this study is whether the traditional, small-scale beef cattle fattening enterprise managed by the Blang Rimeh Farmers Group in Pulo Seunong Village is economically profitable and financially feasible—when evaluated through income, R/C ratio, and ROI indicators—under the prevailing local resource, management, and market conditions

Literature Review

Livestock production is widely recognised as a strategic component of rural development, household income diversification, and national food security, especially in low- and middle-income countries where smallholders dominate the sector (Otte et al., 2019). In Indonesia, rapid population growth and changing dietary preferences have driven a steady increase in meat consumption, while domestic beef supply remains structurally insufficient, forcing the government to rely on substantial annual imports—beef import volume for 2024 was set at about 145 thousand tonnes. This tension between growing demand and limited domestic output has placed renewed emphasis on strengthening smallholder beef cattle systems as a means to reduce import dependence and support national beef self-sufficiency targets (Keloay, Pangemanan, & Pandey, 2022; Sio, Sikone, & Usboko, 2017), as cited in Haryuni et al. (2023). Within this broader context, Aceh Province is frequently highlighted as a region with considerable livestock potential: it possesses abundant feed resources, established livestock traditions, and local policy support, yet still struggles to fully exploit these advantages because of low productivity, limited business orientation, and infrastructural constraints in smallholder systems (Jamilah, 2017).

In this study, the relationship between theory and research variables is clearly established to ensure conceptual coherence and analytical precision. The theoretical foundation draws on farm management and agricultural economics theories, which explain how smallholder decision-making, cost structures, and resource allocation influence profitability and business feasibility. Profitability theory provides the framework for understanding income as the difference between total revenue and total costs, while investment appraisal theory supports the use of indicators such as the Revenue–Cost (R/C) ratio and Return on Investment (ROI) to evaluate financial performance. These theories directly inform the selection and operationalization of the study's key variables—income, R/C ratio, and ROI—which collectively measure the economic viability of the cattle fattening enterprise. Within this theoretical context, income represents the dependent variable influenced by production costs, capital input, and management efficiency as independent variables. The R/C ratio and ROI act as evaluative variables linking theoretical concepts of business efficiency and investment return to empirical financial outcomes. Thus, the theoretical framework not only underpins the research model but also provides logical justification for how traditional management practices and limited resources shape the profitability and feasibility of smallholder beef cattle fattening systems in the Blang Rimeh Farmers Group.

In Aceh specifically, Sofyan et al. (2020) demonstrate through SWOT analysis that Aceh cattle have high economic potential driven by strong local demand, premium meat characteristics, and relative ease of husbandry, but also face serious threats from limited feeder availability, low productivity, and competition with higher-growth breeds, implying that realizing this potential requires both technical and business-oriented improvements. Collectively, the recent literature indicates that smallholder and group-based beef cattle fattening can be profitable where farmers manage multiple animals, combine forages with purchased concentrates, and access adequate

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capital, yet most empirical studies focus on semi-intensive or intensive units with at least two to twenty head and relatively structured rations (Haryuni et al., 2023; Kusumawati, 2021). There is still very limited micro-level evidence on the economic performance and financial feasibility of highly traditional, forage-based fattening systems in which smallholders keep only a single head of beef cattle—often Aceh cattle—within a farmers' group setting, rely almost entirely on locally available forages with minimal concentrate inputs, and operate with very small working capital. This constitutes the core research gap that the present study seeks to address by conducting an in-depth economic and financial analysis of one-head, forage-based beef cattle fattening in the Blang Rimeh Farmers Group in Pulo Seunong Village, linking simple profitability indicators such as income, R/C ratio, and ROI to the practical conditions and constraints faced by Acehnese smallholders.

Research Method

This study employed a mixed-method survey design that integrated both quantitative and qualitative approaches to obtain a comprehensive understanding of the profitability of cattle fattening enterprises in the Blang Rimeh Farmers Group, Pulo Seunong Village, Tangse District. The research was conducted from March to April 2024, and the site was selected purposively based on the predominance of smallholder beef-cattle farmers in the area, consistent with common recommendations for purposive site selection in agricultural studies (Arikunto, 2013). The population consisted of all 11 members of the farmers' group, all of whom were included as respondents. Data collection relied on literature review and field-based methods, including structured observations, semi-structured interviews, and questionnaire administration to document production activities, cost structures, feeding practices, capital use, and management patterns. The scope of data included production volume, input usage, price information, revenue components, and socio-economic characteristics of respondents, aligning with established farm-management research frameworks (Putri et al., 2023). Qualitative data were used to describe management conditions, including housing, feeding, labor involvement, and disease prevention, while quantitative data served as the basis for profitability and feasibility analysis.

The analytical procedures employed both income analysis and financial feasibility evaluation. Income was calculated using the standard farm-income formula $\pi = TR - TC$, where revenue (TR) derives from the total sale value of cattle and total cost (TC) consists of fixed and variable components (Putri et al., 2023). Production costs included cattle purchase price, feed expenditures, labor, depreciation of sheds and equipment, and interest on capital, with depreciation calculated following conventional agricultural asset-valuation methods (Aznar et al., 2011). A feasibility analysis utilized the Revenue-Cost Ratio (R/C ratio) and Return on Investment (ROI), widely applied indicators for evaluating the viability of livestock businesses (Rahmawati et al., 2025). An R/C ratio greater than 1 indicates that the business generates returns exceeding production costs, while ROI measures profit relative to the total investment incurred. These analytical tools allowed the study to determine whether the cattle fattening enterprise managed by smallholder farmers in Blang Rimeh is profitable and financially feasible under current management conditions.

Results and Discussion

Result

The results of this study present a comprehensive overview of the profitability, cost structure, production outcomes, and management practices of the cattle fattening business operated by the Blang Rimeh Farmers Group in Pulo Seunong Village, Tangse District. The findings demonstrate that the cattle fattening activities undertaken by the respondents are still predominantly traditional, marked by small-scale operations, limited adoption of technology, and reliance on locally sourced

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feed materials. The demographic characteristics of the respondents show that all 11 individuals involved in the program are male farmers aged between 21 and 60 years, with the majority falling within the productive age range of 31–50 years, indicating strong labor capacity to support cattle fattening tasks. Educational backgrounds vary, with most respondents having completed secondary school, which provides them with adequate literacy to follow basic farm management recommendations. All respondents list farming as their primary occupation and maintain relatively large household sizes, meaning that income diversification, including livestock activities, becomes essential for sustaining family needs. The volume of the cattle fattening business is uniform, as each respondent manages only one animal, further reinforcing the traditional and small-scale nature of the enterprise. Work experience in livestock farming ranges from 0 to 10 years, indicating that most respondents are not highly experienced and therefore have potential room for improvement in farm management practices. Capital for the cattle fattening venture comes entirely from the farmers' own resources, which limits investment capacity and subsequently the scale of operations.

Table 1. Socio-Economic Characteristics of Respondents and Their Implications

Variable	Category	Percentage (%)	Interpretation
Age group (years)	31–50	81.8	Productive age group, ensuring sufficient labor capacity for daily livestock care.
Education level	Senior high school or above	54.6	Moderate literacy enables understanding of simple livestock management but limits adoption of modern practices.
Main occupation	Farming	100	Cattle fattening acts as a complementary income source within existing farming systems.
Household dependents	≥5 persons	36.4	High dependency ratio drives motivation for income diversification but pressures available labor and capital.
Fattening experience	≤5 years	63.6	Limited experience constrains technical efficiency and production optimization.
Source of capital	Own savings	100	Reliance on personal capital reduces financial risk but limits scalability.

Critical Interpretation:
The demographic composition reflects a capable yet financially constrained workforce. Farmers' reliance on personal capital and family labor suggests that while risk exposure is low, innovation and expansion potential remain restricted.

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Table 2. Management Practices and Technical Performance

Variable	Practice Observed	Implication for Efficiency
Type of cattle	Brahman cross males, 2.5–3 years old	Good growth potential, but selection based on price availability, not performance.
Feeding system	100% green forage, no concentrate	Reduces feed cost but limits growth rate and feed conversion efficiency.
Feeding frequency	Twice daily	Below optimal level (3× recommended) — likely suppresses daily weight gain.
Housing	Wooden single stalls	Adequate protection but poor biosecurity and sanitation potential.
Health management	Cleaning only, no vaccination	Maintains cost efficiency but increases disease risk over time.

Critical Interpretation:

All practices are consistent with low-input, traditional systems. The absence of concentrates and limited feeding frequency represent major efficiency bottlenecks that directly constrain profit margins and ROI.

Table 3. Financial Feasibility Analysis

Indicator	Value (IDR)	Interpretation
Average total cost (TC)	19,040,303	High capital concentration in feeder purchase (≈77% of TC).
Average total revenue (TR)	21,136,364	Positive margin achieved despite minimal input use.
Average net income (π)	2,096,061	Equivalent to ~11% ROI; indicates modest but positive profitability.
R/C ratio	1.11	Business feasible; however, narrow profit margin implies vulnerability to market shocks.
ROI (%)	11	Low return compared to capital intensity; efficiency improvements needed to raise profitability.

Critical Interpretation:

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The R/C ratio >1 confirms economic viability, yet the low ROI illustrates structural inefficiency. Nearly 80% of cost tied to feeder purchase makes profitability highly sensitive to price changes. Improvements in feeding, herd size, and input management are key to increasing returns.

Management practices across cattle fattening units indicate that the selection of feeder cattle (bakalan) is primarily based on availability and ease of adaptation, with farmers commonly sourcing Brahman crossbred males aged 2.5–3 years. This selection aligns with the local preference for breeds with favourable growth potential, although the choice is still restricted by the farmers' capital and local market availability. Feeding practices are entirely dependent on fresh forage collected from surrounding areas, and none of the respondents provide concentrate feed supplements that could enhance weight gain and feeding efficiency. This finding contrasts with national and institutional recommendations that advocate combining green fodder with 1–2% body weight of concentrate to optimize daily body weight gain. Feeding frequency is twice daily, which deviates from recommended schedules of three times daily feeding to maintain consistent rumen activity and maximize feed absorption. Water is provided ad libitum; however, sanitation and water provision facilities remain rudimentary. Housing for cattle consists of single-animal wooden structures with bamboo walls and thatched roofs. Although simple, they provide sufficient shelter from weather extremes. Disease prevention is carried out through routine cleaning and environmental sanitation, but there is no vaccination program or administration of vitamins. Nonetheless, farmers reported no major disease outbreaks during the fattening period, indicating relatively good animal health despite the limited preventive measures. Overall, based on the criteria established by Prawirokusumo (2000), these characteristics categorize the cattle fattening operations as traditional livestock production systems.

The findings give a straightforward picture of how the Blang Rimeh Farmers Group manages its traditional cattle fattening activity and what this means for household income. All 11 respondents are male farmers in their productive age, most of them between 31 and 50 years old, with secondary education as the most common schooling level and farming as their main occupation. They generally have relatively large families and only between zero and ten years of experience in cattle fattening, which suggests that this activity is important for the household but is still handled in a simple, traditional way rather than as a well-developed commercial business. Each farmer keeps only one animal during a four-month fattening cycle, and all capital used comes from their own savings. There is no reliance on credit or formal finance. Together with the use of family labor, this pattern reinforces the view that the enterprise is designed as a low-risk, side activity embedded in the broader farming system, rather than as a primary, growth-oriented livestock enterprise.

Management practices reflect this traditional character. Farmers typically purchase one Brahman cross male, around 2.5–3 years old, primarily based on what is available and affordable in the local market, rather than making deliberate selections for growth or genetic merit. Feeding is entirely based on cut-and-carry green forage collected from surrounding land. On average, each farmer provides approximately 3,609 kg of forage per fattening period, assuming a price of IDR 500/kg, resulting in feed costs of roughly IDR 1,804,545 per head. All daily work—feeding, cleaning, and basic animal care—is done by household members; when valued at IDR 70,000 per labour day, about 25 labour days translate into an imputed labour cost of IDR 1,750,000 per cycle. Depreciation on simple sheds and tools is very low (around IDR 102,122 per period), while the opportunity cost of capital, calculated at 10% per year (4.67% for four months), adds about IDR 610,909. The largest cost component is the purchase of the feeder animal itself: prices range from IDR 12,000,000 to IDR 16,000,000, with an average of IDR 14,772,727 per head. Combining all these items, the average total production cost is IDR 19,040,303 per animal per four-month cycle.

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This figure can be seen as the basic "ticket" a farmer must pay to participate in this one-head fattening system.

On the revenue side, the business generates a clear, though modest, positive return. At the end of the fattening period, the average selling price of the fattened animal is IDR 21,136,364 per head, which is also the average total revenue. Subtracting total costs from this revenue gives an average net income of IDR 2,096,061 per animal per cycle. In simple terms, each farmer earns just over two million rupiah in profit from one head of cattle in four months. This amount is not large enough to transform household welfare on its own, but it does provide an additional and relatively secure income stream. The financial ratios help to interpret this more precisely. The Revenue–Cost (R/C) ratio is 1.11, which means that every IDR 1 spent returns IDR 1.11 in revenue; since the value is greater than 1, the business is financially feasible and not operating at a loss. The Return on Investment (ROI) is 11%, indicating that every IDR 100 invested yields an additional IDR 11 in profit over one year.

Taken together, these results indicate that one-head, forage-based fattening in the Blang Rimeh Farmers Group is profitable but has a low margin. The high share of cost tied up in the purchase of the feeder animal, combined with simple feeding practices (only forage, no concentrate), modest housing, and limited health interventions, restricts the growth potential and the size of the profit. Analytically, this confirms the research gap identified in the introduction: traditional smallholder fattening of a single head of cattle is economically viable, but profitability remains modest and strongly constrained by scale, capital, and management practices. Without policy or program support that helps farmers access better capital, improve feeding and health management, and gradually increase the number of animals kept per cycle, this type of enterprise is likely to remain a supplementary source of income rather than a main pillar of rural economic development.

Discussion

The study demonstrates that the traditional, one-head fattening system practiced by the Blang Rimeh Farmers Group is economically viable but structurally constrained. With an average net income of IDR 2,096,061 per head per four-month cycle, an R/C ratio of 1.11, and an ROI of 11%, the enterprise generates a clear positive return and therefore meets standard feasibility criteria for small-scale livestock businesses. In other words, every rupiah invested yields a modest surplus rather than a loss. However, the magnitude of that surplus is relatively small when viewed against the total production cost of IDR 19,040,303 per cycle and the high share of capital tied up in the purchase of a single feeder animal.

This pattern is typical of community-based beef cattle systems in Indonesia, which are widely described as low-input, family-based and side-business oriented, with limited capacity to accumulate capital or expand scale (Mayulu et al., 2024; Mayulu et al., 2024).

The socio-economic characteristics of the respondents help explain why the enterprise occupies this "supplementary" rather than "primary" livelihood role. Farmers are all male, in productive age groups, with secondary education as the dominant level, relatively large households, and exclusive reliance on farming as their main occupation.

This configuration mirrors other smallholder beef studies in Indonesia, where livestock is integrated into mixed farming systems and used both as an income source and as a form of savings or insurance (Otte et al., 2019; Rohaeni et al., 2024). The fact that all capital comes from farmers' own resources, with no use of formal credit, reduces financial risk but also constrains investment in improved housing, feed, or additional animals. Similar capital constraints have been identified

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as key determinants of smallholder beef profitability and scale across Yogyakarta and other provinces (Haryuni et al., 2023; Mayulu, Puteri, et al., 2024; Otte et al., 2019).

From a technical and management perspective, the production system observed in Blang Rimeh fits squarely within the traditional smallholder category: farmers keep only one Brahman cross feeder, rely exclusively on locally collected forage, feed twice per day, use simple single-animal housing, and do not implement vaccination or routine veterinary programs.

While this strategy minimizes cash outlays and leverages abundant local feed resources, it also limits growth rates and exposes the enterprise to avoidable biological risks. Studies of Aceh cattle and traditional systems show that such low-input management—poor housing, forage-only diets, minimal health interventions—tends to depress both reproductive and fattening performance relative to the genetic potential of the animals (Greenwood, 2021; Sofyan et al., 2020). At the broader sectoral level, stochastic frontier analyses of beef production in Indonesia report average technical efficiency indices around 0.67, with labour, green forage, concentrate use, and feeder weight as key determinants of output (Putri et al., 2023; Rahmah et al., 2021). The Blang Rimeh system, which deliberately avoids concentrates and operates at the minimum possible herd size, appears consistent with this picture of underutilized productive capacity.

The structure of costs in this case study also aligns with findings from more recent economic analyses of beef fattening. The purchase price of feeder cattle is by far the largest cost component, followed by forage, imputed family labour, and a relatively small share for depreciation and interest. Similar cost hierarchies have been reported in cross-bred fattening enterprises in West Java and other regions, where calves/feeder prices, feed costs, and labour jointly define margins (Budisatria et al., 2019; Handayani & Safrida, 2023). Several authors emphasize that fluctuations in feeder prices and feed costs can quickly erode profitability when R/C ratios are close to unity (Haryuni et al., 2023; Mayulu et al., 2024), which implies that the R/C value of 1.11 observed in Blang Rimeh places these farmers in a relatively fragile economic position: profitable in normal conditions, but vulnerable to modest increases in feed or feeder prices, or declines in sale prices.

Comparing the Blang Rimeh results with those of other Indonesian fattening studies clarifies how scale and input intensity influence financial performance. A recent analysis of a farmer group in Gorontalo, managing 20 head with intensive feeding, reported an R/C ratio of 2.864 and a B/C ratio of 1.482—more than double the profitability indicators observed here (Bush, 2024). Similarly, profitability studies in Balikpapan describe R/C ratios well above one and high net and gross profit margins when farmers combine forage with concentrates and maintain larger herds (Nazaruddin et al., 2025). At the other end of the spectrum, feasibility analysis in Sumenep shows that very small herds of two to four head produce R/C ratios between 0.99 and 1.06, meaning that profitability is marginal and strongly dependent on herd size and efficiency (Otte et al., 2019). Against this backdrop, the Blang Rimeh R/C ratio of 1.11 and ROI of 11% can be interpreted as typical of low-input, micro-scale operations: a narrow but positive margin, significantly lower than semi-intensive or intensive group enterprises, yet slightly more robust than the smallest, most constrained herds.

These comparisons also illuminate the specific contribution of this study to the research gap. Most recent profitability and feasibility assessments of beef fattening in Indonesia examine groups or farms managing multiple animals (2–20 head or more), often with some level of concentrate supplementation and improved housing or health management (Handayani & Safrida, 2023; Rohaeni et al., 2024). Very few analyses focus on the micro-level economics of a one-head, forage-based system embedded in a farmers' group, particularly in Aceh, where local cattle resources, supply-chain characteristics, and policy initiatives differ from those in Java or

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Kalimantan. Recent work on the economic potential and supply chain of Aceh cattle highlights that, although demand and prices are high, smallholder management, inadequate record-keeping, and limited access to improved genetics and services hinder performance and impede business development (Achmad et al., 2019; Jamilah, 2017; Sofyan et al., 2020). By documenting the profitability of a one-head fattening model and detailing its cost structure, this study provides the kind of localized evidence that has been missing in the Aceh context and directly addresses the micro-level financial gap identified in the introduction.

The findings also carry several practical and policy implications. First, they suggest that traditional one-head, forage-based fattening can be a rational livelihood strategy for resource-constrained households because it offers a low-risk way to generate additional income using family labour, self-owned land, and freely available feed.

This helps explain why such systems persist despite modest returns: they fit well with household labour calendars and cash-flow patterns, a phenomenon also observed among small-scale beef farmers in Yogyakarta and other regions (Achmad et al., 2019; Rahmah et al., 2021). Second, the narrow margin and heavy dependence on a single animal highlight the importance of risk management. A sudden illness, death, or market downturn affecting one animal would wipe out the entire expected profit for that cycle. This suggests that modest increases in scale—moving from one to two or three head per household, as capital allows—could materially improve both income and resilience, consistent with R/C improvements observed when herd size expands from two to four head in Sumenep (Rahmawati et al., 2025).

Statistically, the Blang Rimeh system's profitability indicators (R/C = 1.11; ROI = 11%) fall within the feasible but low-performing range of Indonesian smallholder beef enterprises. When benchmarked against prior studies, the system performs slightly above extensive subsistence herds yet well below semi-intensive and intensive fattening models, confirming that management scale and feed strategy are the dominant determinants of profitability variance.

Conclusion

This study shows that the traditional one-head, forage-based beef cattle fattening system practiced by the Blang Rimeh Farmers Group is economically viable but low-margin. With an average net income of IDR 2,096,061 per head per four-month cycle, an R/C ratio of 1.11, and an ROI of 11%, the business generates a modest but positive return under prevailing local conditions. The system is well suited to resource-constrained smallholders because it relies on family labour, farmer-owned capital, and locally available forage, so financial risk remains relatively low. At the same time, the dominance of feeder purchase costs in the cost structure, the very small scale (one animal per farmer), and simple management practices limit income gains and leave farmers vulnerable to price shocks, animal health problems, or market volatility. In relation to the identified research gap, the study provides rare micro-level financial evidence on a one-head fattening model in Aceh and confirms that such systems can support household income, but are unlikely to become a strong driver of rural economic transformation without targeted support.

This research has several limitations that should be acknowledged. First, the sample is small (11 farmers) and confined to a single farmer group in one village, so the results cannot be generalized to all beef cattle systems in Aceh or Indonesia. Second, the analysis covers only one four-month fattening cycle and does not capture inter-seasonal variation in feed availability or price fluctuations. Third, some variables—such as family labour cost and capital interest—are based on assumptions rather than directly observed market transactions. Finally, the study focuses on simple financial indicators (income, R/C ratio, ROI) and does not include sensitivity analysis, risk modelling, or broader social and environmental dimensions.

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Based on these findings, three lines of recommendation can be drawn. For farmers, gradual scale-up (from one to two or three head), improved feeding (forage quality and limited use of concentrates where affordable), and basic preventive health measures could increase growth and profitability without radically changing the production system. For policymakers and extension services, group-based credit schemes, technical training on feeding and housing, and support for forage cultivation around villages would directly address the main financial and technical constraints identified. For future research, larger and more diverse samples, comparisons between one-head and multi-head systems, longer observation periods, and sensitivity or risk analyses are needed to better understand how changes in scale, management, and prices would affect the feasibility and resilience of smallholder beef fattening in Aceh and beyond.

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