

Comparison of Marketing Efficiency in the Sheep-Fattening Business Supply Chain Scheme in Langkat District

ABSTRACT

Aims: Analyze the economic efficiency of production and describe the supply chain scheme for the fattening sheep business in Sei Bingai District, Langkat Regency.

Study design: This type of research is quantitative descriptive research.

Place and Duration of Study: The research was conducted from November 2022-January 2023 in Sei Bingai District, Langkat Regency.

Methodology: Data collection techniques include several techniques, namely using questionnaires through Focus Group Discussions (FGD), in-depth interviews with respondents, document analysis, informal discussions, and direct observation. The data analysis method used is Economic Efficiency Analysis and System Supply Chain.

Results: The results showed that 1) The marketing of fattening sheep in Sei Bingai District, Langkat Regency, has been efficient. This is proven by the results of efficiency calculations which show the efficiency of the three supply chain schemes is below 50%. Compared to the other two channels, scheme two is said to be the most efficient because the efficiency value is only 13.2%. In comparison, the highest efficiency value is in scheme three, followed by the first channel scheme. 2) The supply chain scheme for fattening sheep in Sei Bingai District, Langkat Regency, consists of producer breeders, agents, regional market intermediaries, and consumers.

Conclusion: Improvements in performance indicators provide good performance results for the sheep-fattening supply chain. Efforts to improve the indicators of order fulfillment and compliance with standards are carried out by having good cooperation with suppliers. Companies must be more involved in handling the quality and quantity of fattening sheep.

Keywords: Langkat Regency, Marketing efficiency, Sheep Fattening, and Supply Chain.

1. INTRODUCTION

Sheep fattening business is one of the strategic commodities in Indonesia because changes in the price of fattening sheep business can affect inflation [1]. The cause of high inflation can be an increase in the price of the livestock business [2]. In addition, the business of fattening sheep is also a high-value commodity, so many farmers are working on it. The total production for fattening sheep businesses in North Sumatra in 2021 will reach 29,222 tons, while the need for 43,000 tons [3]. The high demand for fattening sheep in 2021 will increase prices due to a decrease in production.

This condition is caused by the uneven marketing distribution of the fattening sheep business, resulting in price fluctuations in each region. During the harvest season, the

28 central areas experienced a decline, resulting in losses for producer farmers, while in other
29 areas, consumers had to buy at high prices [4]. An effort must be made to organize the
30 supply chain system so that there is an even distribution from the central area to other
31 regions to create a balance between stock and price [5].

32 So far, the cooperative system between breeders and companies has yet to be a written
33 contract [6]. This collaboration only relies on trust between the two, in which breeders sell
34 their sheep fattening to the company, and the company only buys fattening sheep according
35 to the company's grade. The selling price for fattening sheep offered by the company to
36 farmers for fattening sheep is above the price for fattening sheep in traditional markets.
37 However, the selling price for fattening sheep is not fixed but is adjusted to market conditions
38 because there is no contract, so the selling price has yet to be agreed upon.

39 This study aimed to analyze the economic efficiency of the production of sheep-fattening
40 businesses and describe the supply chain scheme for sheep-fattening businesses in Sei
41 Bingai District, Langkat Regency. This research is essential to carry out, namely 1) because
42 the results of the research can be used as information for sheep fattening business farmers
43 in improving their performance through the application of agribusiness development strategy
44 models for fattening sheep business in Sei Bingai District, Langkat Regency by examining
45 the production aspect, namely measuring the level of efficiency economy by measuring the
46 efficiency of the use of production inputs and the efficiency of production unit prices. 2)
47 Information for stakeholders or companies can be used to hold good cooperation with
48 partners to manage their supply chain so that they can meet consumer needs, from breeders
49 to retailers. 3) For government, the results of this study are expected to be helpful for the
50 local and regional government to be used as a reference in efforts to increase production
51 and profit for breeders in the fattening sheep business.

52

53 **2. METHODOLOGY**

54

55 The research was carried out in Langkat Regency by specifying several areas that develop
56 farming for fattening sheep. The object of research is farming actors, both producing
57 breeders, marketing institutions, and production input business actors. Other respondents
58 are the Department of Agriculture Agricultural Extension Agency. Data was collected using a
59 questionnaire through Focus Group Discussion (FGD) and in-depth interviews with
60 respondents. The research was carried out with three stages of research, as follows; Stage
61 (1) analyzes economic efficiency; Stage (2) describes the supply chain model for fattening
62 sheep in Sei Bingai District, Langkat Regency, to produce a more effective and efficient
63 scheme for carrying out farming business for fattening sheep using Supply Chain
64 Management Analysis.

65 This research was carried out from November 2022 to January 2023 in Sei Bingai District,
66 Langkat Regency, because this area is one of the areas with great potential in developing a
67 sheep farming business. Respondents' requirements were breeders cultivating sheep-
68 fattening businesses in the study area. The research method used is a survey method with a
69 unit of analysis of breeders who carry out the business of cultivating sheep fattening.

70

71 **2.1. Population and Sample**

72 The population in this study were all cattle breeders in the business of fattening sheep in Sei
73 Bingai District, Langkat Regency. In this study, sampling was carried out by census or as a
74 whole.

75 **2.2. Data Collection Technique**

76 Data collection activities include several techniques: questionnaires through Focus Group
77 Discussions (FGD), in-depth interviews with respondents, document analysis, informal
78 discussions, and direct observation. Interviews involved decision makers and experts who
79 are responsible for the cultivation of fattening sheep business in Sei Bingai District, Langkat
80 Regency. This data collection technique is appropriate for analyzing marketing efficiency
81 comparisons in supply chain schemes for sheep fattening and implementing contract farming
82 models in Sei Bingai District, Langkat Regency.

83 **2.3. Data analysis**

84 **2.3.1. Economic Efficiency Analysis**

85 Namely measuring the efficiency level in the use of factors of production and determining the
86 right price for the implementation of fattening sheep business in coastal lands. The research
87 was conducted in the first year using the Cobb-Douglas equation:

88
$$Y = X_1 + X_2 + X_3 + \dots + X_n \dots \dots \dots [2].$$

- 89 Information:
90 Y = Production results
91 X_1 = Production Input 1
92 X_2 = Production Input 2
93 X_3 = Production Input 3
94 X_n = nth Production Input n
95

96 The analysis used to measure allocative efficiency compares revenues with expenses so
97 that the production unit price is known. The analysis used is marketing efficiency analysis
98 with the marketing channel criteria that the EP value is smaller than the EP value of other
99 marketing channels.

100
$$EP = (TB / TNP) \times 100\% \dots \dots \dots [3].$$

- 101 Information:
102 EP = Marketing Efficiency (%)
103 TB = Total Marketing Cost (Rp/kg)
104 TNP = Total Production Value (Rp/kg)

105 **2.3.2. System Supply Chain**

106 Describe the supply chain model for fattening sheep in Sei Bingai District, Langkat Regency,
107 to produce a more effective and efficient scheme for farming operations for fattening sheep
108 in Sei Bingai District, Langkat Regency using Supply Chain Management Analysis.
109

110 3. RESULTS AND DISCUSSION

111 3.1. Production Cost Analysis of Sheep Fattening Business

112 The costs incurred by breeders in managing the sheep-fattening business consist of fixed
113 and variable costs. Fixed costs are costs that cannot change (constant) for each level of the
114 number of results produced or that are not used up in one production period and are still
115 incurred even though they are not producing, including depreciation costs. The fixed costs
116 incurred in this sheep-fattening business are the stable and equipment depreciation costs.
117 One way to calculate depreciation costs is the difference between the item's initial value and
118 the item's final value divided by the length of use. This is by research [7] that the
119 depreciation cost is obtained by dividing the investment price by the estimated number of
120 years the length of the investment is used.

121 Variable costs can change at any time depending on the size of the production volume or
122 costs used up during production. The variable costs of this sheep-fattening business include
123 the cost of beef cattle at the beginning of the year, additional feed, medicines, vitamins, and
124 labor wages. For more details, the average costs incurred in this business can be seen in
125 Table 1.

126 **Table 1. Average costs incurred in fattening sheep**

No	Description	Effort value (Rp)
1	Fix Cost	513.000
	1.1. Cost of depreciation	513.000
	1.2. Tax	-
2	Variable Cost	226.836.410
	2.1. Cost of Production Facilities	221.604.743
	2.2. Labor costs	5.231.667
3	Total Cost (1+2)	227.349.410

127 *Source: Primary Data (processed), 2023.*

128 Table 1 shows that the fixed costs incurred in fattening sheep at the study site amounted to
129 Rp. 513,000, - consisting of depreciation costs for cages and livestock equipment
130 depreciation costs of Rp. 513,000, with a percentage rate of 0.23 percent of the total cost.
131 Variable costs consist of costs of production facilities and labor costs. The production
132 facilities used in the fattening sheep business are Rp. 221,604,743, with a percentage of
133 97.4 percent consisting of additional feed costs, costs for vitamins and medicines, and
134 livestock costs at the beginning of the year. The cost of labor used is Rp. 5,231,667, with a
135 percentage of 2.30 percent of the total cost of fattening sheep in the Sei Bingai District.

136 Based on the research results, variable costs are more significant than fixed costs, namely
137 99.54 percent. This is in line with research [8], which states that spending on fixed costs
138 does not affect the number of products produced but affects the profit earned by beef sheep
139 breeders. Meanwhile, variable costs affect the amount of product produced.

140 Analysis of Income from Sheep Fattening Business

141 The size of the income from the fattening sheep business is primarily determined by the size
142 of the production and the price at harvest. The price for beef cattle for Males is Rp
143 7,500,000; for Adult Males, it is Rp 11,500,000 per head. The average beef cattle production
144 per year for Males is six heads, and for Adult Males is 12. The average revenue and income
145 from the sheep-fattening business can be seen in Table 2.

146 **Table 2. Revenue and Income from Sheep Fattening Business Per Year**

No	Description	Effort value (Rp)
1	<i>Fix Cost</i>	513.000
2	<i>Variable Cost</i>	226.836.410
3	Total Cost (1+2)	227.349.410
4	Total Revenue (P*Q)	314.053.350
5	Income (4 - 3)	86.703.940

147 *Source: Primary Data (processed), 2023.*

148 Table 2 shows the value of production (revenue) generated from businesses in this research
 149 area of Rp 314,053,350 per year. Beef cattle are sold alive and fresh. The total cost, which
 150 results from the sum of fixed costs (fixed costs) and variable costs (variable costs), is Rp.
 151 227,349,410. The data processing results from Table 2 show that the net income from
 152 fattening sheep farmers is obtained from the total income minus the total cost of Rp.
 153 86,703,940 per year.

154 By looking at the assessment criteria that a business is profitable if a price level multiplied by
 155 the amount of beef cattle production exceeds all costs, it can be ascertained that the sheep-
 156 fattening business is feasible to develop. At the level of efforts to maximize profits, it is
 157 usually realized through increased technical efficiency. When viewed from the net income of
 158 sheep breeders per month can be seen in Table 3.

159 **Table 3. Distribution of Income Levels in the Sheep Fattening Business in the Study**
 160 **Area**

<i>Descriptive Statistics Net Income</i>				
Description	Sample	Lowest	Highest	Average
Net Income	30	Rp. 1.931.517	Rp. 42.218.167	Rp. 7.225.328

161 *Source: Primary Data (processed), 2023.*

162 Table 3 shows that the lowest net income for fattening sheep in the study area is Rp
 163 1.931.517 per month, and the highest net income is Rp. 42,218,167. So that the average net
 164 income received by fattening sheep breeders in the study area is Rp. 7,225,328 per month.
 165 This is because there are differences in the amount of business production and the use of
 166 superior seeds owned by breeders, so the resulting production also varies. The difference in
 167 the number of products produced will affect the costs incurred and the income received by
 168 the farmer. Based on field surveys, the difference in production also lies in the scale of the
 169 business. The larger the scale of the business, the greater the production and income. Vice
 170 versa, the smaller the scale of the fattening sheep business, the smaller the products
 171 produced. In addition, farmers' experience in the research area also influences business
 172 production. The greater the business experience, the greater the opportunity to increase
 173 production and income. This was proven when the sample had the highest experience,
 174 namely 16 years of running the sheep fattening business, and the business scale was large;
 175 the production was also high, so the income he earned was also large, namely Rp.
 176 42,218,167 per month.

177 **3.2. Economic Analysis and Feasibility of Livestock Fattening Business**

178 After completing the production costs and income analysis, the feasibility of the fattening
 179 sheep business in Sei Bingai District can be seen in Table 4.

180

181 **Table 4. Feasibility Analysis of Sheep Fattening Business in Dusun I Klambir Lima**
 182 **Village**

No	Description	Unit	Effort value
1	Total Cost	Rupiah	227.349.410
2	Total Revenue	Rupiah	314.053.350
3	Net Income (2 - 1)	Rupiah	86.703.940
4	Revenue Cost Ratio (2/1)	-	1,38

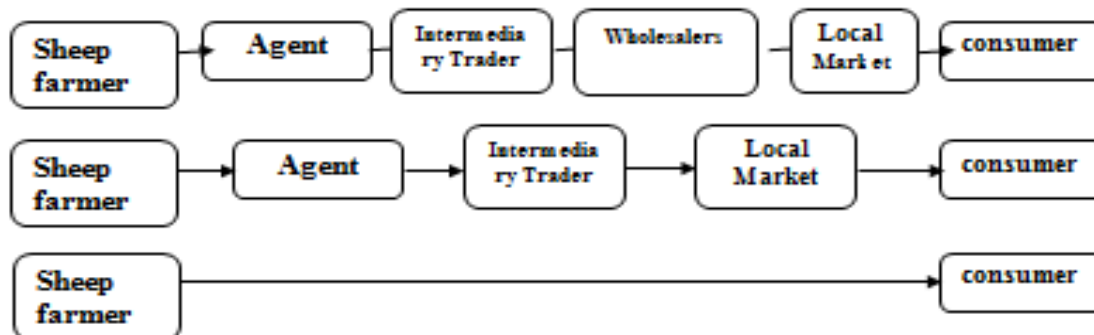
183 *Source: Primary Data (processed), 2023.*

184 Table 4 shows that the R/C ratio is 1.38. The value of the R/C ratio is obtained from a
 185 comparison of the total receipts of IDR 314,053,350 with a total cost of IDR. 227,349,410,-.
 186 Economically, the fattening sheep business in Sei Bingai District is feasible to be cultivated
 187 (developed) as indicated by the value of R/C Ratio > 1, an average value of 1.38. This
 188 means that with a sacrifice (production costs) of Rp. 1.00, the beef sheep breeder will
 189 receive revenue (production value) of Rp. 1.38. Concerning this situation, the fattening
 190 sheep business in the research area is feasible and profitable and can even be developed or
 191 run.

192 3.3. Supply Chain Scheme of Sheep Fattening Business

193 Several areas are production centers for fattening sheep in Sei Bingai District, Langkat
 194 Regency. This area annually produces sheep fattening with characteristics similar to sheep
 195 fattening. The visible difference is that the size is relatively smaller when compared to
 196 fattening sheep from other areas. Marketing for fattening sheep is carried out by marketing in
 197 general, both with general trade patterns and informal contract patterns with several large
 198 dealers with more capital. Marketing is carried out in the regions and distributed outside the
 199 city to meet national needs. On average, breeders do not sell their crops directly to the
 200 market; most are sold to dealers and intermediaries through direct sales or slashing
 201 systems.

202 The supply chain scheme describes the flow or distribution route for fattening sheep to local
 203 and regional markets in Sei Bingai District, Langkat Regency. Based on research data, the
 204 supply chain scheme for fattening sheep in Sei Bingai District, Langkat Regency, is
 205 explained in Figure1.



206
 207

Figure 1. Supply Chain Scheme of Sheep-Fattening Business

208 3.4. Efficiency of Marketing Channels for Sheep-Fattening Business

209 **Table 5. Comparison of Margins, Prices, and Marketing Efficiency of Sheep Fattening**

No	Description	Marketing channel		
		I	II	III
1.	Marketing Margin (Rp/Kg)	32.880	25.200	22.000
2.	Price (Rp/Kg)	68.500	60.000	55.000
3.	Marketing Efficiency (%)	14,6	13,2	17,3

210 *Source: Primary Data (processed), 2023.*

211 Based on Table 5, the marketing of fattening sheep in Sei Bingai District, Langkat Regency,
212 has been efficient. This is proven by the results of efficiency calculations, which show that
213 the efficiency of the three supply chain schemes is below 50%. Compared to the other two
214 channels, scheme two is the most efficient because the efficiency value is only 13.2%. While
215 the highest efficiency value is in scheme three, followed by the first channel scheme.

216 3.5. Supply Chain Performance Analysis of Sheep-Fattening Business

217 The performance measured is the performance for the past year with the reason of
218 comparing how the performance of the supply chain for fattening sheep in the previous and
219 following semesters. Measurement of a company's performance can be measured between
220 three to six months or even annually [9].

221 3.6. Partner Farmer Supply Chain Performance

222 The internal performance of partner breeders is measured from several indicators, including
223 (Table 6): on the lead time value indicator, the smaller the value produced, the better the
224 supply chain performance. The average value of lead times and order fulfillment cycles for
225 all commodities decreased from semester one to semester two, meaning that the supply
226 chain performance was getting better [10]. The second indicator is about Total Supply Chain
227 Management Cost (TSCMC). The lower the TSCMC value, the better the supply chain
228 performance. The results of the TSCMC calculations in the two semesters say it has
229 experienced a significant decrease in value, although it is not that significant. This is in line
230 with research [11]. This means that the performance of the supply chain for fattening sheep
231 on partner breeders is relatively good.

232 Measuring the external performance of partner farmers consists of several aspects: Perfect
233 Order Fulfillment is the percentage of timely delivery of orders according to the date of the
234 consumer's order and the date desired by the consumer, expressed in percent [12]. Getting
235 closer to 100 percent means that the performance of a supply chain will be better, and if it
236 reaches 100 percent, it means that the performance of the supply chain can be said to be
237 good [11]. Based on Table 6, the value of Perfect Order Fulfillment at the partner farmer
238 level shows good performance. There was an increase in the performance of sending
239 farmers from semester one to semester two, with an average score of almost 100 percent for
240 each farmer.

241 **Table 6. Supply Chain Performance for Sheep Fattening**

No.	Performance Indicator RP	Benchmark	Performance Value RP
1.	POF (%)	100	97,2
2.	Compliance with standards (%)	100	92,8
3.	Order fulfillment	100	98,1
4.	Order fulfillment cycle	decreased	2,05
5.	Lead time	decreased	2,31
6.	TSCMC	decreased	3.875,7

Source: Primary Data (processed), 2023.

242 If the order fulfillment indicator gets closer to 100 percent, it means that the performance of a
243 supply chain will be better, and if it reaches 100 percent, it means that the performance of
244 the supply chain can be said to be good [11]. Table 6 shows that the performance of partner
245 breeders by standards is good, and the standard compliance performance of sheep farmers
246 has increased over the past year.

247 In the standard conformity indicator, if it gets closer to 100 percent, it means that the
248 performance of a supply chain will be better, and if it reaches 100 percent, it means that the
249 performance of the supply chain can be said to be good [11]. Table 7 shows that the
250 performance of partner breeders by standards is good, and compliance with standards
251 performance has increased over the past year. Partner farmers continue to evaluate and
252 improve their performance results. Farmers are categorized as quite good at meeting
253 company standards; this can be seen from the many holidays and aqiqah events that occur
254 throughout the year so that farmers pay more attention to the quality the company wants to
255 reduce the risk of losing customers

256

257 **4. CONCLUSION**

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259 This study concludes that marketing fattening sheep in Sei Bingai District, Langkat Regency,
260 has been efficient. This is proven by the results of efficiency calculations, which showed that
261 the efficiency of the three supply chain schemes is below 50%. Compared to the other two
262 channels, scheme two is the most efficient because the efficiency value is only 13.2%. At the
263 same time, the highest efficiency value is in scheme three, followed by the first channel
264 scheme. The supply chain scheme for fattening sheep in Sei Bingai District, Langkat
265 Regency, consists of producer breeders, agents, regional market intermediaries, and
266 consumers.

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274 **COMPETING INTERESTS**

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276 Authors have declared that no competing interests exist.

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279 **AUTHORS' CONTRIBUTIONS**

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281 This work was carried out in collaboration between all authors. Julia Marisa designed the
282 study, performed the statistical analysis, wrote the protocol and wrote the first draft of the
283 manuscript. Fachrina Wibowo managed the analyses of the study. Ridho Kurniawan
284 managed the literature searches. All authors read and approved the final manuscript

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