

# OPTIMIZATION OF THE ACEH BEEF CATTLE PRODUCTION AND PROCESS USING SWOT ANALYSIS AND INDUSTRIAL SUPPLY CHAIN APPROACHES

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## ABSTRACT

The problem in management process and production of Aceh beef cattle farms in Aceh Besar has not been explored. This study aimed to determine the basic system of supply chain for the Aceh beef cattle production in Central Aceh Besar developed a model for optimizing the supply chain management and sustainability to increase productivity and business efficiency. This research used SWOT analysis and industrial supply chain approaches. The results showed that the current supply chain system of the Aceh beef cattle industry in Aceh Besar which has been running so far, needs to be strengthened to increase production and population of Aceh beef cattle in the future. There were 4 issues were identified: time, 29.6% faster than the current supply chain supply time; method, 60% no longer needed a business intermediary; cost, 21.4% of the live weight price of cattle was cheaper than the live weight price of current supply chain cattle; and stages, 30.8% shorter than the ongoing supply chain stages. The result of the SWOT analysis matrix showed that the SO (strength-opportunities) strategy was the main strategy for business developing of Aceh beef cattle in Central Aceh. In conclusion, it is necessary to optimize the implementation of the supply chain of Aceh Cattle Industry at Central Aceh by utilizing its strengths and suppressing the existing weaknesses from the breeding production to marketing process.

Key words: Aceh cattle, industry, production, supply chain, SWOT

## ABSTRAK

Permasalahan dalam manajemen proses produksi peternakan sapi Aceh di Kabupaten Aceh Besar belum tereksplorasi. Penelitian ini bertujuan untuk mengetahui sistem dasar rantai pasok produksi sapi potong Aceh di Aceh Besar untuk mengembangkan model optimalisasi pengelolaan rantai pasok dan keberlanjutan guna meningkatkan produktivitas dan efisiensi usaha. Penelitian ini menggunakan analisis SWOT dan pendekatan rantai pasok industri. Hasil penelitian menunjukkan bahwa sistem rantai pasok industri sapi potong Aceh di Kabupaten Aceh Besar yang berjalan selama ini perlu diperkuat untuk meningkatkan produksi dan populasi sapi potong Aceh di masa mendatang. Ada 4 isu utama yang telah diidentifikasi: waktu, 29,6% lebih cepat dari waktu pasokan rantai pasokan saat ini; metode, 60% tidak lagi membutuhkan perantara bisnis; biaya, 21,4% dari harga bobot hidup sapi lebih murah daripada harga bobot hidup sapi rantai pasok saat ini; dan tahapan, 30,8% lebih pendek dari tahapan rantai pasokan yang sedang berlangsung. Hasil matriks analisis SWOT menunjukkan bahwa strategi SO (strength-opportunity) merupakan strategi utama pengembangan usaha sapi potong Aceh di Kabupaten Aceh Besar. Kesimpulan dari penelitian bahwa implementasi rantai pasok industri Sapi Aceh di Kabupaten Aceh Besar perlu dioptimalkan dengan memanfaatkan potensi yang dimiliki dan menekan kelemahan-kelemahan yang ada mulai dari proses pembibitan, produksi hingga pemasaran.

Kata kunci: sapi Aceh, industry, produksi, supply chain, SWOT

## INTRODUCTION

Beef cattle sector is one of the potential agricultural sectors in Aceh, but there are still many people who have not been involved in the business sector, especially in District of Aceh Besar. Therefore, many development programs have been launched by the Aceh Government, including coaching, monitoring and evaluation of breeding system, trading model that result the increase in benefit of cattle business. It was well known that Aceh cattle is one of native Indonesian cattle (Aceh cattle, coastal cattle, Madura and Bali cattle) but Sumba-Ongole and Java-Ongole (PO) cattle are also considered as local Indonesian cattle breeds (Martoyo, 2003). Currently, there are 200 thousand families in Aceh, raising more than 700 thousand cattle and more than 350 thousand buffalo (Bapenas, 2015). However, the breeding system of Aceh beef cattle are still traditional, resulting the economic income of farmer is still low. Economically, breeder of Aceh beef cattle will generate economic added value if they have a minimum of 4 cows.

The population of Aceh Beef Cattle in Aceh Besar in the last 5 years has increased by 8% thus the cattle population in Aceh Besar has the potential to be developed more advanced. Supply chain is a network of business system that work together to create and deliver a product into the hands of end users which also applies to the cattle business. The main component of supply chain usually includes suppliers, manufacturers, wholesalers (distributors), retailers, as well as supporting companies such as logistics service companies (Gounaris, 2005; Pujawan, 2005). As a part of business development efforts, SWOT analysis is a systematic identification of various factors to formulate a company strategy (Van der Vorst *et al.*, 2011; Osita, 2014), including as a business strategy of Aceh beef cattle. This analysis was based on logic that can maximize strengths and opportunities but simultaneously can minimize weaknesses (Dahlan *et al.*, 2017). It was necessary to conduct research on Aceh cattle farms, especially related to the supply chain to determine the basic supply chain system and optimization models in supply chain management on

Aceh cattle farms to increase the productivity of Aceh beef cattle farms in Aceh Besar.

**MATERIALS AND METHODS**

This research used a model of supply chain and SWOT analysis approaches. Analysis of supply chain management used to identify the connection of all parties involved in the input, process, implementation, marketing and other mechanism of Aceh cattle industry in Aceh Besar. In addition, SWOT analysis compared the external factors (opportunities and threats) and internal factors (strength and weaknesses) that affecting the Aceh cattle industry in Aceh Besar. In general, the method used in this research is described in Figure 1.

**RESULTS AND DISCUSSION**

**Chain Flow of Aceh Cattle Breeding at UD. Aceh Tani Lestari, Aceh Besar**

The result of the present study showed that the application of the business supply chain was very important in running a cattle breeding business in District of Aceh Besar, covering the business supply chain from the breeding activity, the growing and fattening activity to the marketing, and consumer processes. Based on the observations on the implementation of the supply chain flow of Aceh cattle breeding business at UD. Aceh Tani Lestari, Aceh

Besar, starting from the identification of the input (source), the process of transforming the input into a calf/calf (make), marketing (delivery), and consumers there were 23 supply chain components that carried out in the business. In detail, the supply chain flow and its components are described in Figure 2 and Table 1.

The results showed that supply chain flow on Aceh Cattle Breeding Program has 22 stages. This is a characteristic of traditional livestock business where the supply chain flow runs very long. Aramyam *et al.* (2006) stated that in the agribusiness value chain, value chain analysis has been developed into many stages where the purpose of the value chain analysis is to improve supply chain performance. It was clearly known that the requirements to be met are the understanding of the product flows, information flow (information flows), as well as management and control in the value chain (Rakhmat *et al.*, 2017). In this context, value chain analysis is a diagnostic tool used to assist management decisions and produce recommendations for improved value chains.

In addition, supply chain covers all interactions between suppliers, manufacturers, distributors, and customers in all business activities (Korpela *et al.*, 2002). Supply chain including interactions, dealing with transportation, scheduling the information, transferring the credit and cash, and transferring the raw material (Heizer and Render, 2001). Supply chain management is related to the complete cycle of raw

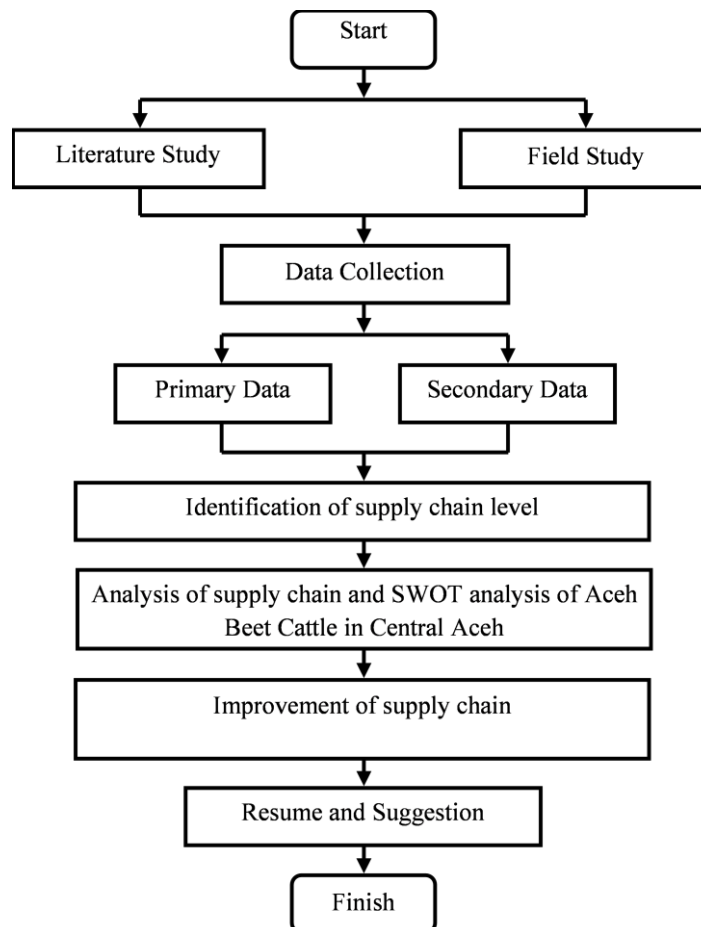


Figure 1. Flow chart of research approaches

materials from suppliers to productions, warehouses, and distributions to customers (Siagian, 2005). In short, it was clear that companies strengthen competitiveness through product quality, cost, and speed to create added value in the supply chain and it was a major step on supply chain flow of Aceh Cattle Breeding Program in Aceh Besar.

**The System of Supply Chain for Aceh Cattle Industry in Aceh Besar**

Currently, it was well known that the supply chain system of the Aceh cattle industry in Aceh Besar consists of several parts. Supplier section were feeding and cattle farmers, production section were growing heifer and female cows; distributor division were cow middleman and animal market; wholesaler section were cattle trader; the retail section were the meat market; and the consumer section were wedding party

activities, commemoration of Islamic holidays, meugang, qurban, restaurant, catering, hotel, meatball culinary, restaurants, and households.

The supply chain that used for supply chain system was longer than generally accepted in cattle farming system, where breeders did growing heifer and female cows activity and then picked up by middleman or the breeders themselves bring cows to sell at animal market. In the animal market the middleman started negotiating with the cow owners before the cattle send to cow traders at agreed price. All cows suitable for slaughter were sent to both official and private slaughterhouses (RPH) by cattle traders. Finally, beef that has been slaughtered then sent to meat market before reaching the consumers. The current supply chain system of Aceh cattle farming industry in Aceh Besar was shown in Figure 3.

In the livestock business to run a business providing

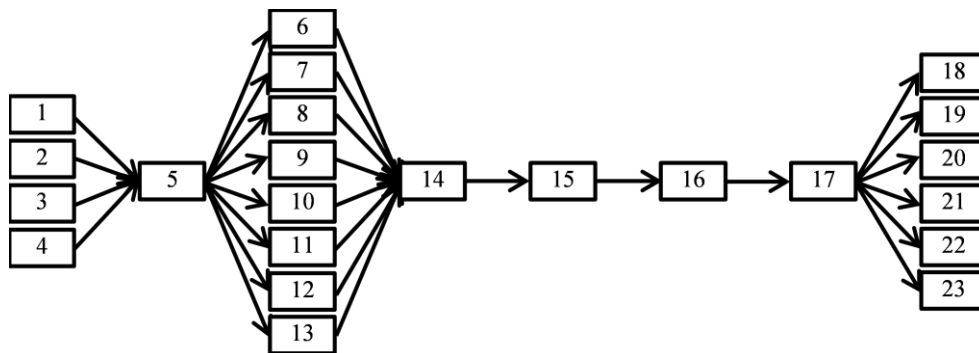


Figure 2. Supply chain flowchart of Aceh Cattle Breeding business at UD. Aceh Tani Lestari, Central Aceh

Table 1. Supply Chain Flow on Aceh Cattle Breeding Program

No	Source	No	Make	No	Delivery	No	Consumer
1.	Female cow	6.	Feeding	15.	Promotion	18.	Restaurant
2.	Feed nutrition	7.	Drinking water	16.	Marketing	19.	Catering
3.	Medicine and supplement	8.	Feeding supplement	17.	Cattle traders	20.	Hotel
4.	Frozen cement for AI	9.	Artificial insemination			21.	Culinary of meatball
5.	Barns	10.	Barn management			22.	Household
		11.	Female cow management				
		12.	Delivery process				
		13.	Heifer management				
		14.	Commercial cows				

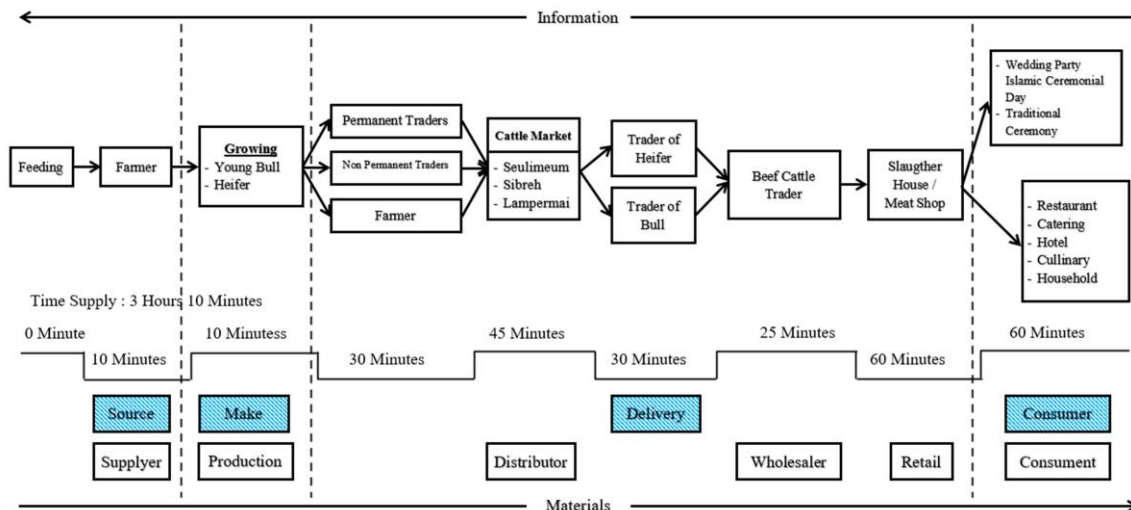


Figure 3. Supply chain system of Aceh Cattle Industry in Central Aceh (base line)

profit, the success of companies depends on the strength of its weakest supply chain participants. The primary goals of supply chain management is satisfying end-consumers as well as all supply chain participants by getting the right product, to the right place, at the right time and price and at the right cost (Dunne, 2001; Olhager *et al.*, 2002). In this study, it was observed that supply chain system of Aceh cattle industry in Central Aceh also affected by the time to implement all components of supply chain system.

**Model for Optimizing Sustainable Supply Chain Management of Aceh Cattle Industry in Central Aceh**

A supply chain model where the marketing efficiency of each supply chain flow is better than the previous one, where component involved: livestock groups raise cows starting from breeding, fattening and female cow, owners (livestock groups) sell themselves to animal markets. In this case, cattle traders directly negotiate with owners on agreed price. On the other hand, cows that are ready to be slaughtered are transported to the Slaughterhouse (RPH) and Non-RPH for slaughter, then meat send to the market then distributed to consumers. Yayat *et al.* (2010) reported that based on the mechanism of supply chain on beef cattle indicated that there were 6 models supply chain which each model was affected by the prevailing system among members of the supply chain, customer location and product quality. The optimization model of sustainable aceh cattle industry supply chain management in Central Aceh Besar was presented in the Figure 4.

It was obtained in this study related to supply chain management of Aceh Cattle, that is necessary to optimize a model sustainable supply chain development model can be proposed so that later it will provide greater benefits. Supply chain competency is necessary for agribusiness actors which can only be reaching though improving their capability to learn, to collaborate with, to absorb knowledge and to execute (Muflikh and Suprehatin, 2009). The optimization of

supply chain model for the Aceh cattle industry that can be suggested for future were: time, method, cost and stages has also been obtained. The optimization model of the supply chain for Aceh Cattle Industry was clearly shown in the Table 2.

**Aceh Cattle Farming Business Development Strategy Using SWOT Analysis**

In the present study, it was observed that a development strategy that are suitable for the development of the Aceh cattle breeding business in Aceh Besar was formulated into four main strategies. It was identified from the result of SWOT analysis where the development strategy was divided into; Strength-Opportunities (SO) strategy, Weakness-Opportunities (WO) strategy, Strength-Threat (ST) strategy and Weakness-Threat (WT) strategy. The result of SWOT analysis on the elements of strategy for developing Aceh's cattle farming business in Aceh Besar was shown in Table 3.

The matrix of SWOT analysis showed that the SO (Strength-Opportunities) strategy for developing Aceh's cattle breeding business in Aceh District were increasing the number of Aceh cattle population; maintain good relations with third parties; and maximizing self-sufficiency program. This result is accordance with Rakhmad *et al.* (2017) which reported the SWOT and QSP analysis matrix or Quantitative Strategic Planning Matrix (QSPM) on the imported beef marketing business. The analysis showed that there were three strategies that can be implemented; Strategy 1: Conducting tripartite cooperation (government, imported frozen beef distributor, and local beef distributor) to conduct joint marketing of imported frozen beef and procuring refrigeration equipment to the point of retailers in the traditional market; Strategy 2: Expanding market share of imported frozen beef to industrial segments (hotels, meat processing company); Strategy 3: Working closely with imported beef suppliers to overcome the problem of taste (taste) and lack of weight of imported frozen beef. Gunasekaran *et al.* (2004) stated that

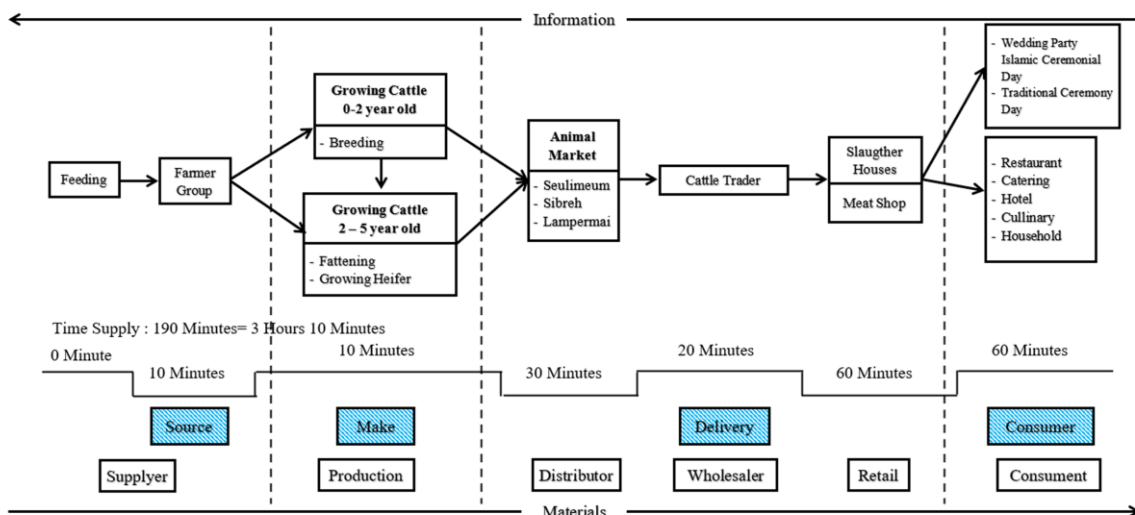


Figure 4. Optimization model of sustainable supply chain management on Aceh Cattle Industry in Central Aceh

**Table 2.** SWOT analysis on improvement strategy of aceh cattle industry at Central Aceh

Internal  External	<b>STRENGTHS</b> 1. Farmer Experience is Fairly Good 2. Farmer education is adequate 3. Land for forage is available 4. Increasing interest in buying superior calves / calves 5. Easy of selling livestock The location of the livestock business is easy to reach 6. There are capital loans from third parties 7. Availability of abundant agricultural waste	<b>WEAKNESSES</b> 1. The scale of the cattle farm business is still small 2. Labor is still limited 3. Ownership of livestock is still low 4. Land use and production capacity are not optimal 5. The existence of substitute products and fluctuations in cattle prices 6. Unstable increase in prices 7. Loan interest rates are still high for breeders 8. There is no optimal utilization of agricultural waste
	<b>OPPORTUNITIES</b> 1. Easy to obtain concentrate 2. Increase demand for beef 3. Self-sufficiency program 4. The use of AI technology	<b>STRATEGY (S-O)</b> 1. Increasing the number of cattle population in Aceh. 2. Maintain good relations with third parties. 3. Maximizing self-sufficiency program.
<b>TREATHS</b> 1. Fluctuating price of concentrate feed 2. Change of function of agricultural land 3. There is no partnership effort 4. Maintenance patterns that are still traditional	<b>STRATEGY (S-T)</b> 1. Provide a new feed area around the barn. 2. Changing the maintenance system from traditional to a modern model	<b>STRATEGY (W-T)</b> 1. Processing agricultural waste into highly nutritious animal feed. 2. Maximize the remaining land to be more productive

**Table 3.** The concept of the supply chain model for the Aceh Cattle Farming Industry

Criteria	Supply chain		(%)
	Base line	Proposed model	
Time	4 hours 30 minutes	3 hours 10 minutes	29,6
Method	5 person (middleman)	2 person (middleman)	60,0
Cost	Rp. 70.000/Kg/Head	Rp. 55.000/Kg/Head	21,4
Step	13 Steps	9 Steps	30,8

aspects of supply chain studies including: supply chain objectives, supply chain structure, resources, management chain, business processes and chain performance supply. However, the ability to take advantage of the strength and opportunity components as well as to suppress weaknesses are important strategy in carrying out the supply chain system in Aceh livestock business in the future.

### CONCLUSION

It was very clear that on the supply chain system of the Aceh cattle industry in Central Aceh which have been running need to be strengthened to support the development of Aceh's cattle production and population in the future. The results of the study on 4 criteria to produce a model of supply chain management optimization of the sustainable Aceh cattle livestock industry in Aceh Besar to increase productivity and business efficiency, including: time (29.6% faster than the current supply chain supply time), method (60% of intermediaries are no longer needed), cost (21.4% of the live weight price of cattle is cheaper than the live weight price of current supply chain cattle) and stages (30.8% shorter than the ongoing supply chain stages). It was also observed that the SO (Strength-Opportunities) strategy is the

main strategy for the development of Aceh's cattle business in Aceh District, which by doing increase the number of Aceh cattle population, maintain good relations with third parties; and maximizing self-sufficiency program.

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