

## INCREASING THE ADDED VALUE OF BROILERS IN LHOKSEUMAWE CITY BY DEVELOPING SUPPLY CHAIN AND FOOD BALANCE MODELS

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### Abstract

*The purpose of this study was to determine the supply chain's path or flow pattern from the production source area to the consumer, as well as the parties involved, design a supply chain model, and build a food balance to determine whether there was a surplus or deficit of broiler meat in Lhokseumawe City. Furthermore, utilizing the Hayami technique, this study assesses the added value and profit for traders selling chicken meat. Documents, questionnaires, and interviews with retailers were used to collect data. The findings revealed that retailers controlled or monopolized the supply chain of broiler meat distribution, while producers were accomplices of several large corporations that controlled or monopolized the commodity of broiled chicken in Aceh Province. North Aceh Regency, Pidie Jaya Regency, and Pidie Regency are all sources of commodities coming from outside of Lhokseumawe City. To solve the problem of broiler meat supply, all competent parties, including the government, the commercial sector, relevant agencies/institutions, researchers, academics, scientists, and specialists, must work together to build a design model for the purebred broiler meat supply chain. Most actors cooperate and support one another to gain additional value and profit. Meanwhile, to make up for the losses, a few dealers sell other poultry products including free-range chicken and duck, as well as collect waste from the birds.*

**Keywords:** *Supply Chain, Food Balance, Value Added, Profit*

### 1. INTRODUCTION

Food issues are always more urgent and vital in addition to other needs due to the high population growth rate [1]. The community's use of food commodities has resulted in a rise in the supply of the food commodity. Broiler meat is one of them, as it is one of the ten commodities that contribute to inflation [2].

Commodity apart from seafood and beef, chicken meat is a popular item. The increased consumption is attributable to the vast number of people who eat this item, the rise in people's income, and the expansion of the food industry, which supports the broiler farming industry. During Islamic holy festivals such as fasting, Eid al-Fitr, Eid al-Adha, and the birthday of the Prophet Muhammad SAW, there is an increase in demand for animal food in the city of Lhokseumawe.

This commodity's total production or sale is 139,627 tons, while its entire consumption is 1,128.96 tons [2]. The results of these data show that consumption needs far outnumber production. As a result, much of the broiler meat consumed in Lhokseumawe City is imported.

The increased consumption in Lhokseumawe City stimulates the development of a broiler meat market with a variety of different qualities, varieties, and prices, increasing the broiler market's complexity. Policymakers need to know about consumption and demand to estimate community needs and the impact of changes in prices and income on consumption and demand levels (demand elasticity), as well as to supply and fulfill broiler meat supply capacity. Meanwhile, producers and traders in Lhokseumawe City can utilize this data to organize the supply chain for broiler meat.

The supply chain is a notion in which product flow, information flow, and financial flow are all governed by a regulatory framework [3]. According to [4] and Munawir [5], supply chain refers to the integration of business operations from end users to initial suppliers that give products, services, and information that add value to customers.

One strategy for increasing competitiveness is to use the supply chain. Because supply chain operations are a part of value chain activities, supply chain improvements will benefit the added value chain [6]. The supply chain process must be considered in the poultry sector so that it does not solely rely on production activities. Because, in essence, various activities in the chicken supply chain can add value that is advantageous for all parties involved in the production chain and product distribution from farmers to end customers [7]. The profit value is calculated using the extra value offered to chicken products, as well as product mobility from one link to the last.

Based on the amount of food produced, procured, and used, as well as the level of availability for population consumption per capita, the food balance can explain the availability of chicken meat commodities in the city of Lhokseumawe. The food balance reports on the status of food procurement and supply, including food stock and use for industrial purposes, whether from own production or other sources. In addition, the food balance shows how much food is available for consumption by the population throughout a given time period.

The following issues will be investigated in this study: tracing the supply chain path from the source of production to consumers and other parties involved in the supply chain, the flow pattern of the supply chain for broiler meat commodities, how to design a purebred chicken supply chain model in the city of Lhokseumawe, forming the food balance to see the surplus or deficit of this commodity, and determining or calculating the added value as the profit level of each party in the supply chain.

The supply chain, food balance, and value addition are all highlighted and discussed in this study. So that it may identify the gain of added value that is beneficial for broiler dealers in the city of Lhokseumawe by applying supply chain models and food balances.

## 2. IMPLEMENTATION METHOD

The supply chain, according to Assauri [8] and Pangestuti [9], is a set of activities or processes that transport commodities or services from producers to consumers. Supply chain management will be used to determine the relationship between product flows, financial flows, and information flows from farmers to final customers, resulting in an activity that can provide added value products.

According to the Ministry of Agriculture [10], the food balance depicts the availability of food for each commodity and its processed products that are commonly consumed by the population, based on supply and use. The entire amount of food produced is subtracted from the change in stock, which is added to the total amount imported and subtracted from the total amount exported during the time. While the usage is derived from the entire demand for feed, seeds, food and non-food sectors, as well as food ingredients for human use,

Production minus stock changes, plus imports, and minus exports yields the supply of a food commodity. Production, stock movements, imports, and exports are all included in the supply chain. The supply equation is written in this format:

$$TS = O - \Delta St + M - X$$

where, TS = total domestic supply (total supply), O = production, St = ending stock – beginning stock, M = import, X = export.

The added value estimated by Sari [11] is used to determine the size of the price difference between the input value and the output value created by the company. The pricing differential will boost business actors' earnings. The Hayami method was used to calculate the added value. The value added method of hayami is used to determine the additional value of broiler meat. Table 1 shows how the Hayami Method was used to calculate the added value analysis.

**Table 1. Value Added Analysis Framework of the Hayami Method**

| <b>Output, Input, Harga</b>              | <b>Formulasi</b>           |
|--|----------------------------|
| 1. Output (kg)                           | A                          |
| 2. Raw Material (kg)                     | B                          |
| 3. Labor (JKO)                           | C                          |
| 4. Conversion factor                     | $D = A/B$                  |
| 5. Labor coefficient                     | $E = C/B$                  |
| 6. Output price                          | F                          |
| 7. Wages                                 | G                          |
| <b>Pendapatan dan Keuntungan (Rp/kg)</b> |                            |
| 8. Raw material prices (Rp/kg)           | H                          |
| 9. Other input contributions (Rp/kg)     | I                          |
| 10 Output Value (Rp/kg)                  | $J = D \times F$           |
| 11. a. Added Value (Rp/kg)               | $K = J - I - H$            |
| b. Value Added Ratio (%)                 | $L\% = (K/J) \times 100\%$ |
| 12. a. Labor Rewards (Rp/kg)             | $M = E \times G$           |
| b. Labor share/share (%)                 | $N\% = (M/K) \times 100\%$ |
| 13. Margin                               |                            |
| a. Profit (Rp/kg)                        | $O = K - M$                |
| b. Profit rate (%)                       | $P\% = (O/K) \times 100\%$ |

All business actors involved in the distribution of broiler meat in 5 (five) markets in the Lhokseumawe City area were interviewed for this study. According to field observations, Lhokseumawe City has 64 business actors scattered throughout all markets. However, only 30 business actors agreed to be questioned since others refused to be interviewed and were not available when the survey crew went to the field to conduct interviews.

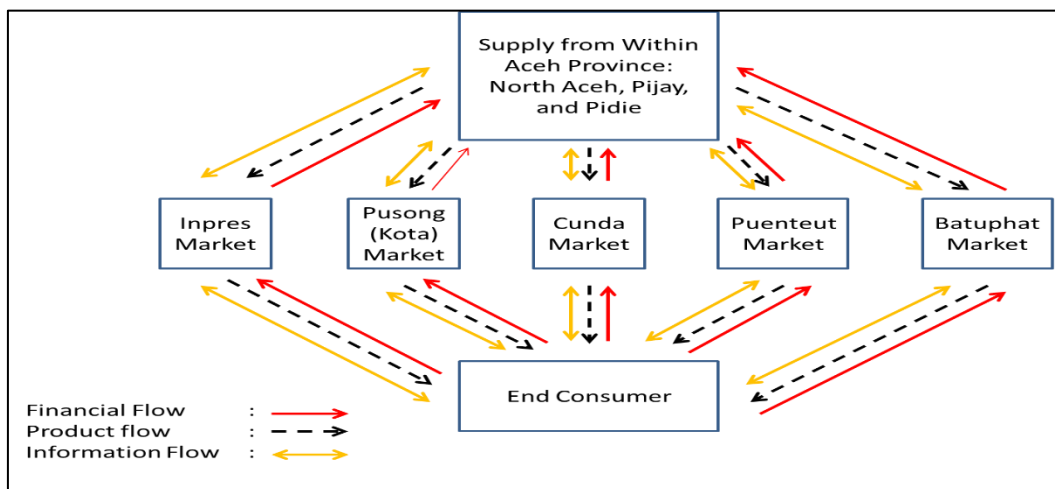
### 3. RESULTS AND DISCUSSION

#### 3.1 Supply Chain Paths and Involved Parties

The supply chain for purebred chicken in Lhokseumawe City is based on the findings of field research that purebred chicken is sourced from Aceh Province's North Aceh Regency (Lhoksukon, Nisam, Cot Trung, Bungkah, Krueng Mane), Pidie Jaya Regency (Meureudu), and Pidie District (Beureunuen). PT. Japfa (PT. Ciomas Adisatwa and PT. Comfeed), PT. Charoen Pokphan, and PT SUR are among the big firms that manufacture commodities in these three locations.

All of the corporations work with local Aceh breeders, and local farmers only donate land for cage facilities that meet the company's standards. The organization handles all manufacturing operations, including providing chicken seeds, feed, and immunizations, as well as distribution.

Broiler meat commodities are distributed directly to retailers in all marketplaces in Lhokseumawe City by associates of the four significant enterprises indicated above, bypassing the wholesaler route. This is why these industries are so reliant on broiler meat in Lhokseumawe City. Figure 1. depicts the purebred chicken supply chain in Lhokseumawe City. The only parties participating in the purebred chicken supply chain in Lhokseumawe City are retailers, whereas purebred chicken farmers and suppliers are all sourced from outside the city limits.



**Figure 1. Lhokseumawe City Chicken Meat Commodity Supply Chain**

In the supply chain process of purebred chicken in Lhokseumawe City, three types of flow: product flow, financial flow, and information flow. Figure 4.15 shows the flow's shape. The product flow begins with manufacturers from North Aceh Regency, Pidie Jaya Regency, and Pidie Regency, all of which are located outside of Lhokseumawe City. Producers (PT. Ciomas Adisatwa and PT. Comfeed, PT. Charoen Pokphan and PT SUR) provide directly to shops in five market regions of Lhokseumawe City on a daily basis. After retailers acquire purebred chicken from producers, the meat is sold directly to individuals in need, such as ultimate customers, meatball and somay dealers, restaurants, hospitals, street fried chicken traders, chicken penyet traders, and fried chicken sellers.

In Lhokseumawe City, the financial flow in a purebred chicken supply chain is a financial cycle from customers willing to pay for purebred chicken. The money goes from the final consumer to the retailer, who then sends the money to the producer the same day.

Meanwhile, smoothing the flow of products and financial flows that occur along the chicken meat supply chain in Lhokseumawe City requires the flow of information. All supply chain actors, including manufacturers, merchants, and customers, communicate through information flow. Information is exchanged in both sides, from producers to retailers and vice versa. Then it's on to the customer from the retailer, and vice versa. In the supply chain, information can move either horizontally or vertically. The flow of information between actors in the purebred chicken supply chain in Lhokseumawe City relates to price, quantity demanded, and quality. This is done to keep the supply chain's actors trusting each other.

### 3.2 Design Supply Chain Model

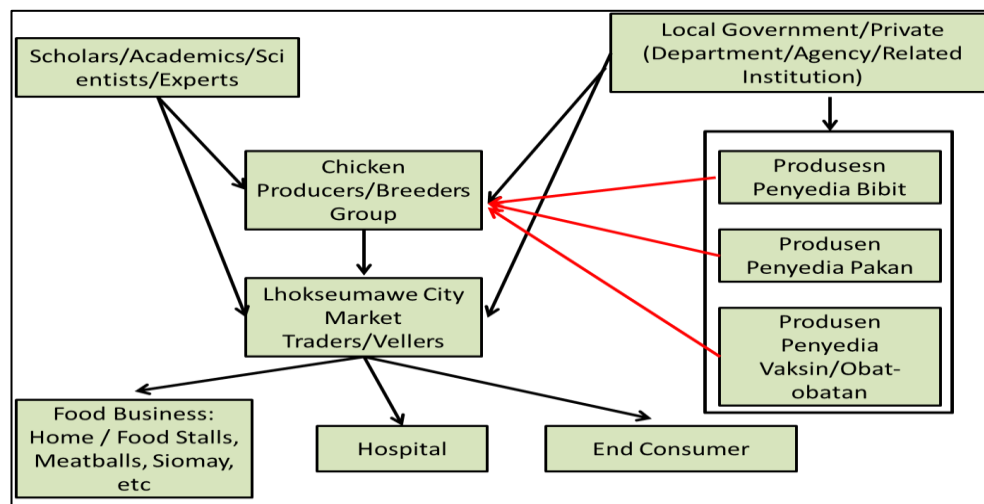
According to observations and information from chicken meat retailers in all markets in Lhokseumawe City, it is necessary to pay attention to the government and local private parties (entrepreneurs) in order to grow and develop broiler farms in the Lhokseumawe City area through the formation of farmer groups. Scholars/academics/scientists/experts must also be active in order to contribute to groups of farmers and traders in all markets in Lhokseumawe City. Empowerment, such as training, counseling, and mentorship, can help develop broiler breeder groups. So that the farmer group can grow this enterprise on its own.

The expansion of broiler farming in Lhokseumawe City will have a positive impact on the city's economic growth. The introduction of employment prospects for people of Lhokseumawe City from the business or industry of broiler farming itself has a significant impact on economic growth. The expansion of job options has a direct impact on the reduction of unemployment and poverty rates. The multiplier effect, or the derivative industry of broiler farming, will increase if this can be

accomplished by the government and the local business sector. Feed, vaccination, and livestock medicine are examples of derivative industries that are directly tied to the broiler cattle industry.

The government's focus should not be solely on the broiler livestock business and its derivatives. What is required now, however, is essential and ongoing aid to groupings of broiler breeders and dealers in the development, maintenance, and expansion of their enterprises. Bank Indonesia representatives from Lhokseumawe City have so far aided a large number of retailers. Bank Indonesia contributed in the form of training to enhance sales, rather than providing capital aid.

Retailers believe that the government will always provide capital support and manage the availability of purebred chicken meat supplies, whether in surplus or deficit, to keep purchasing and selling prices consistent. If a deficit occurs, it is the government's and private sector's responsibility to assist in the procurement of goods to meet the needs of the residents of Lhokseumawe City. In the event of a surplus, the government and private sector, through the appropriate agencies, seek out or aid in the marketing of broiler meat commodities to places in need. Figure 2. depicts the design form of the purebred chicken supply chain model for Lhokseumawe City.



**Figure 2. Lhokseumawe City Chicken Meat Supply Chain Model Design**

Retailers have only been able to advertise or distribute purebred chicken to food establishments in the Lhokseumawe City region and areas outside of the Lhokseumawe City area, such as the Matangkuli area in North Aceh Regency, thus far. Retailers also distribute or sell chicken meat to the community (end customers) and all hospitals in Lhokseumawe City.

Because retailers are unable to establish a derivative business from chicken meat, the additional value and profits are less than ideal. This is evident in the researchers' calculations of added value and profit, which are based on data from all merchants. In addition, many retailers suffered considerable losses as a result of the corona virus pandemic, which coincided with the local government enforcing health protocol restrictions. Due to a shortage of purchasers, this year's supply of chicken meat at all marketplaces in Lhokseumawe City was in excess.

As a result, involvement and participation in the development of the chicken meat commodities business sector and its offshoot industries/businesses requires seriousness from the government, private sector, academia, and others. Seriousness must be demonstrated by offering training, counseling, and assistance so that business actors can progress toward independence. With independence, it is envisaged that the broiler meat commodity industry/business in Lhokseumawe City will be able to compete with the industries that currently control the distribution of this commodity.

### 3.3 Food Balance

The food balance in a region refers to the equilibrium between food production and consumption. When production exceeds consumption, the area's food commodity production is considered surplus. If, on the other hand, production falls short of consumption, the area is considered to be in deficit.

**Table 2. Food Balance Commodity Chicken Meat in Lhokseumawe City in 2021**

| Commodity       | Production (Ton) | Consumtion (Ton) | Surplus/Deficit (Ton) | Purchase Area                     | Sales Area |
|-----------------|------------------|------------------|-----------------------|-----------------------------------|------------|
| Daging Ayam Ras | 2402.05          | 2007.35          | 394.7                 | Aceh Utara, Pidie jaya, dan Pidie | Aceh Utara |

The results of Table 2. of the food balance demonstrate that North Aceh District, Pidie Jaya District, and Pidie District supply broiler meat to Lhokseumawe City. Meanwhile, a minor portion of the purebred chicken marketed outside of Lhokseumawe City, especially North Aceh Regency, is sold. In 2021, three regencies in Aceh Province will produce 2402.05 tons of broiler meat. As much as 2007,35 Tons for consumption and other requirements. The statistics of purebred chicken production (sales) and consumption in Lhokseumawe City show that there is now a surplus of 394.7 tons of purebred chicken meat in the city (approximately 197,350 chickens).

### 3.4 Added Value and Benefits

The difference between the value of production, the value of raw materials, and the value of other inputs other than labor is known as added value (Noviantari, 2015). This study assesses the added value of a broiler meat retailer based on a year's worth of production (sales). Because all producers supplying broiler chicken to the market region of Lhokseumawe City come from outside the city, such as North Aceh Regency, Pidie Jaya Regency, and Pidie Regency, the added value of producers is not calculated. Purebred chicken is only distributed by suppliers or producers to market merchants and traders' residences.

The added value of sales of purebred chicken meat or input (raw) materials solely is calculated using data gathered from field information sources. Due to a lack of capital, knowledge, and courage, the majority of existing traders do not wish to build a derivative business/industry from broiler meat.

Table 3. shows that retailer 08, who sell purebred chicken meat in the Presidential Instruction market, have the maximum added value of Rp. 10,833/Kg and a profit of Rp. 10,824/Kg. The sale of purebred chicken generates revenues for 16 (sixteen) shops. Their plan is to assist one another in the sales process. If one of the dealers does not run out of stock, another trader assists in the transaction. They agree to aid each other in exchange for the sharing of their profits. Furthermore, they do not solely sell to consumers. In Lhokseumawe City and North Aceh District, they also sell to warungs/restaurants, meatball mills, meatball sellers, somay sellers, hospitals, caterers, and businesses near markets.

**Table 3. Value Added and Profit/Loss (Rp/Kg)**

| No | Name        | Added Value (Rp/Kg) | Profit/Loss (Rp/Kg) |
|----|-------------|---------------------|---------------------|
| 1  | Retailer 02 | 8,000               | 7,996               |
| 2  | Retailer 04 | 7,504               | 7,498               |
| 3  | Retailer 06 | 6,750               | 6,747               |
| 4  | Retailer 08 | 10,833              | 10,824              |
| 5  | Retailer 09 | 557                 | 554                 |
| 6  | Retailer 12 | 1,386               | 1,384               |
| 7  | Retailer 13 | 5,417               | 5,382               |
| 8  | Retailer 15 | 796                 | 794                 |
| 9  | Retailer 17 | 2,774               | 2,772               |
| 10 | Retailer 18 | 1,774               | 1,770               |
| 11 | Retailer 20 | 2,491               | 2,489               |
| 12 | Retailer 21 | 3,490               | 3,446               |
| 13 | Retailer 22 | 3,327               | 3,324               |
| 14 | Retailer 23 | 1,809               | 1,384               |
| 15 | Retailer 26 | 1,948               | 1,946               |
| 16 | Retailer 29 | 3,234               | 3,232               |

Due to the corona virus pandemic, broiler meat sales are currently considerably different from past years. According to dealers, the start of the COVID-19 pandemic in 2020 had little impact on chicken meat sellers' sales. They believe that, despite the fact that Covid-19 is located in Lhokseumawe City, the profit from sales may still be maximized.

The city administration of Lhokseumawe will publish a warning and a policy tightening health regulations for people of the Lhokseumawe City region, including permanent residents and immigrants, in 2021. Despite the fact that the policy was modified, most traders did not maximize their earnings. Table 4. shows the loss obtained by trader 07 who sells in the pusong market. Retailer 07 and other traders sell free-range chicken, duck, and even become collectors of poultry waste to compensate losses from the selling of purebred chicken.

**Table 4. Value Added and Profit/Loss (Rp/Kg)**

| No. | Name        | Added Value (Rp/Kg) | Profit/Loss (Rp/Kg) |
|-----|-------------|---------------------|---------------------|
| 1   | Retailer 01 | -4,000              | -4,006              |
| 2   | Retailer 03 | -3,390              | -3,393              |
| 3   | Retailer 05 | -1,250              | -1,300              |
| 4   | Retailer 07 | -13,384             | -13,386             |
| 5   | Retailer 10 | -1,667              | -1,672              |
| 6   | Retailer 11 | -2,218              | -2,218              |
| 7   | Retailer 14 | -1,687              | -1,691              |
| 8   | Retailer 16 | -890                | -893                |
| 9   | Retailer 19 | -2,695              | -2,699              |
| 10  | Retailer 24 | -63                 | -292                |
| 11  | Retailer 25 | -982                | -990                |
| 12  | Retailer 27 | -2,308              | -2,313              |
| 13  | Retailer 28 | -692                | -693                |
| 14  | Retailer 30 | -7,169              | -7,219              |

#### 4. CONCLUSION

Retailers control the supply chain for purebred chicken distribution at the Lhokseumawe City Market, whereas producers are accomplices of various large companies that control or monopolize the commodity of

purebred chicken from outside the City of Lhokseumawe, namely North Aceh Regency, Pidie Jaya Regency, and Pidie Regency.

To be able to overcome the problems of broiler meat supply in the Lhokseumawe City area, competent parties such as the government, the private sector, relevant agencies/institutions, scholars, academics, scientists, and experts are involved in the development of the design model for the purebred chicken meat supply chain. From breeding to selling meat, it is hoped that all stakeholders will work together to make Lhokseumawe City a center for producing and distributing purebred chicken meat. Because of everyone's care and earnestness, derivative industries and companies associated to broiler meat commodities can flourish. The creation of derivative businesses and companies associated to broiler meat commodities has the potential to create jobs and boost Lhokseumawe City's economic growth.

Some retailers benefit from one other's assistance in order to get additional value and profits. Meanwhile, sellers who lose money sell other poultry products like free-range chicken and duck and become poultry meat waste collectors.

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