

IMPLEMENTATION OF VALUE CHAIN ANALYSIS IN THE BROILER SUPPLY CHAIN AGRIBUSSINESS

Rini Oktavera, Erna Andajani

Industrial Engineering Department, WR Supratman University and Management Department
Surabaya University

ABSTRACT

Animal protein has more competitive advantages compared with other vegetable protein due to higher essential amino acid content. Animal protein has good effect in developing human intellectual and growth. The average consumption portion of Indonesian people for animal food is very low, 81.9 gr/day from ideal standard 150 gr/day (WNPG, 2008). While the potential of population poultry (duck, layer, broiler, chicken free-range, quail) in East Java is very big, even this layer population is 30.74 % of national population which result 379.288. Animals commercial poultry feed production of East Java is the highest in Indonesia weighs 2,713,070 tons/year in 2007 or 34,78 % of the national product..

However, the market demand and poultry price of the product for both broiler and layer are fluctuating depending on availability of input and output supply. This is caused by lack of coordination, synergy and effectiveness of poultry agribusiness policy and the limit of information about performance of supply chain management. Broiler is one of animal protein sources that fulfills domestic and export demand. Broiler agribusiness has complete individual plants and facilities constituents from downstream to upstream that can absorb a lot of workers.

Therefore the purpose of this research can be divided into two categories as follows : the general purpose and specific purpose. The general purpose is to know the alternative scenarios which can be relevant to optimize supply chain performance of broiler and to help the government determine the policy of poultry. The specific purpose is to map broiler supply chain using value chain analysis and to understand the “current state” of the whole supply chain from animal production to purchase of meat products which is described in Big Picture Mapping. The next step is to analyze values added in each of the individual plants and facilities of this supply chain using Hayami Method

Big Picture Mapping shows the result of value chain analysis consisting of six groups of small business. The result of the value added analysis of the individual plant and facilities shows that independent farmers, collectors, processing nuggets have obtained an optimal return.

Key Words : Supply chain management, Value chain analysis, Hayami Method, Broiler Agribusiness

INTRODUCTION

Today's developments of various economic sectors and businesses have an impact on competition in the various agribusiness products. Broiler is one of animal protein sources that fulfills domestic and export demand. The broiler agribusiness has complete individual plants and facilities constituents from downstream to upstream that can absorb a lot of workers. As commodities in general, however, the supply chain actors are relatively independent among one another. As a result, every actor acts only based on the local information. It causes information distortion along the supply chain. This distortion makes the fulfilling of demand become less effective and it triggers a very high price fluctuation. Therefore, to improve the performance of broiler supply chain, an innovation it is needed through the value chain approach (value chain) among the doer of businesses by using the supply chain management approach.

For those reasons, the problems can be formulated as follows:

1. What causes the price fluctuation?
2. Does the broiler agribusiness have the added value?
3. How do the mapping of the broiler supply chain in the big picture mapping?
4. How do we know added value of each individual plant and facilities consistent?

The specific objectives of this study are as follows:

1. The supply chain of broiler agribusiness can be mapped by using the value chain analysis approach.
2. By understanding the value chain, it is expected to understand the supply chain conditions described in the *Big Picture Mapping*.
3. It can be analyzed the added value in the each value chain process by using the Hayami's method.

REVIEW OF LITERATURE

Poultry

Poultry is a type of bird cattle used for the its meat and eggs.

Fowl (*Gallus gallus domesticus*) is a commonly poultry used for livestock. The cross-bred among chicken race has produced hundreds of superior or pure strains with various functions. The most common is a broiler (slaughtered chicken) and laying hens (for its eggs). The chicken can also be cross-bred with its close relatives. The green jungle chicken which produces sterile hybrids, its male is known as *Ayam Bekisar*. With a population of more than

24 billion in 2003, *firefly Bird Encyclopedia* states that there are more chickens in this world than the other birds. The chicken supply two sources of protein in food, chicken meat and eggs.

Broiler is a chicken strain as the result of engineered technology which has economic characteristics, characterized by rapid growth as a producer of meat, the short harvest and producing meat with soft fibers, piling the good meat, bigger breasts and smooth skin (North and Bell, 1990). According to Rasyaf (1999), the broiler is a chicken which has rapidly grown at the age of 1-5 weeks. He also explained 6-weeks old broiler has as big as 8-months old general adult chicken. The broiler excellence is supported by the genetic traits and environmental circumstances including food, environmental temperature and maintenance. In general, in Indonesia, the broilers are marketed at 5-6 weeks old weighing 1.3 to 1.6 kg although the growth rate has not been maximized yet, because the heavier broiler is difficult to sell (Rasyaf, 1999). According to Mountney (1983), the good broiler is a fast growing with white coat color, no dark colors on its carcass, having a uniform size. The broiler will grow optimally at the environmental temperatures of 19° C-21° C.

Day Old Chicken (DOC)

Day Old Chicken or often called as DOC is a 1-day-old chick. The DOC is crucial to the success of the farm business. A good condition of DOC is a first important asset and needed to be considered. Recognizing this, the government has issued the Indonesian National Standard (SNI) 01-4868.1-2005 for DOC of commercial broiler (broiler type). This is done to ensure the DOC quality in the circulation. The DOC must come from the broiler breeders which must be free from infectious animal diseases and comply with the regulations. The good DOC is marked with the following criteria:

1. Meet the ideal body weight: 35 grams or according to standard weight which is not less than 32 grams. The DOC weight positively correlates with the growth rate of chickens.
2. Behave nimble, agile and active foraging. If it is held, it will react, and its feces is not sticky on its rectum.
3. Its position in the group is always scattered.
4. Elastic abdominal cavity, dry navel covered by soft cotton feathers, smooth and shiny.
5. Her eyes are round and bright.

If, in this effort of selecting, the farmers are able to identify the above conditions, then at least this will reduce the risk of unexpected internal factors.

Value Chain

Womack, Jones et al, 1990 defines the Value Chain Analysis (VCA) as follows:

"...is a technique widely applied in the fields of operations management, process, engineering and supply chain process." management, for the analysis improvement of resource utilization and product flow within manufacturing process."

While Shank and Govindarajan, 1992: Porter, 2001, defines the VCA, as a tool to understand the value chain forming a product. This value chain is based on the done activities, from the raw materials to the consumers, as well as the after-sales service. Furthermore Porter (1985) describes the Value Chain Analysis as a strategic analysis tool which is used to better understand the competitive advantage, to identify where the customer value can be increased or decreased the cost, and to better understand the company's relationships with the suppliers, the customers and other companies in the industry. The value chain identifies and connects the variety of strategic activities in the firm (Hansen, Mowen, 2000). The trait of value chain depends on the industries' traits and it is heterogeneous for manufacturing companies, service companies and organizations which are non profit-oriented.

Supply Chain Management

Supply Chain Management (SCM) is not really a new concept. According to Jebarus (2001) SCM is a further development of the product distribution management to meet the consumer needs. This concept emphasizes on the integrated pattern related to the product flow from suppliers, manufacturers, retailers to consumers. From here, the supplier activity to the end consumer is in a unity without a major barrier, so the mechanism of information among the various elements takes place in a transparent manner. The SCM is a concept related to the product distribution pattern which can replace the distribution patterns, production schedule and logistics.

The pattern of traditional logistics management relationship is still adversarial, meaning that the relationship pattern is still concerned the parties individually and do not refer to the overall performance of the parties forming a supply chain.

Big Picture Mapping

Big Picture Mapping is a tool adopted from the Toyota production system, it is a tool which can be used to describe a system as a whole and its flow (value stream) contained in the company. Thus later, it obtains a description of the information flow and physical flow of the system, identifies where the *waste* takes place, as well as describes the lead time required based on the each process characteristic activity

.Value Added Analysis

According to Hayami et al (1987) in Sudiyono (2002), there are two ways to calculate the added value, i.e. the value added for processing and the value-added for marketing. The factors affecting the value added for processing can be categorized into two, namely technical factors and market factors. The influential technical factors are the production capacity, the amount of raw materials, and the employees. While the influential market factors are the output price, the employee's salary, the raw material and other input values.

According to Sudiyono (2002), the value added of processing is derived from the reduction of raw material costs and other inputs towards the produced product value, excluding employees. In other words, the added value describes the benefits for employees, asset and management which can be expressed mathematically as follows:

$$\text{The Added Value} = f (\mathbf{K, B, T, U, H, h, L})$$

Notes	:	K	:	Production Capacity (Kg)
		B	:	Used raw materials (Kg)
		T	:	Used employees (HOK)
		U	:	Employee's salary (Rp)
		H	:	Output price (Rp/Kg)
		h	:	Raw materials price (Rp)
		L	:	Other input value

RESEARCH METHODOLOGY

The location and time of the research were conducted in Pandanarum, Mojokerto during June to July 2012. In this research, data processing and collection were performed by using secondary and primary data methods. The primary data were obtained from the interview result with the related people in the field. While the secondary data was obtained from literatures studies and previous studies related to this research and from statistical data related to this study.

From the result of interviews and literature studies, the data are figured out in the *Big Picture Mapping* to determine the actors involved in the supply chain and to know the scenario which occurs in the supply chain and its information flow. From the results of big

picture mapping, we can see its supply chain flow. Then, the added value will be analyzed on the each process member by using the Hayami's method.

ANALYSIS AND DISCUSSION

From the result of interviews and direct survey to some farmers, information was obtained information about the value chain of broiler supply from the upstream industry to downstream. The data were then mapped in the flow structure of value chain contained in Figure.1 The flow structure of the value chain.

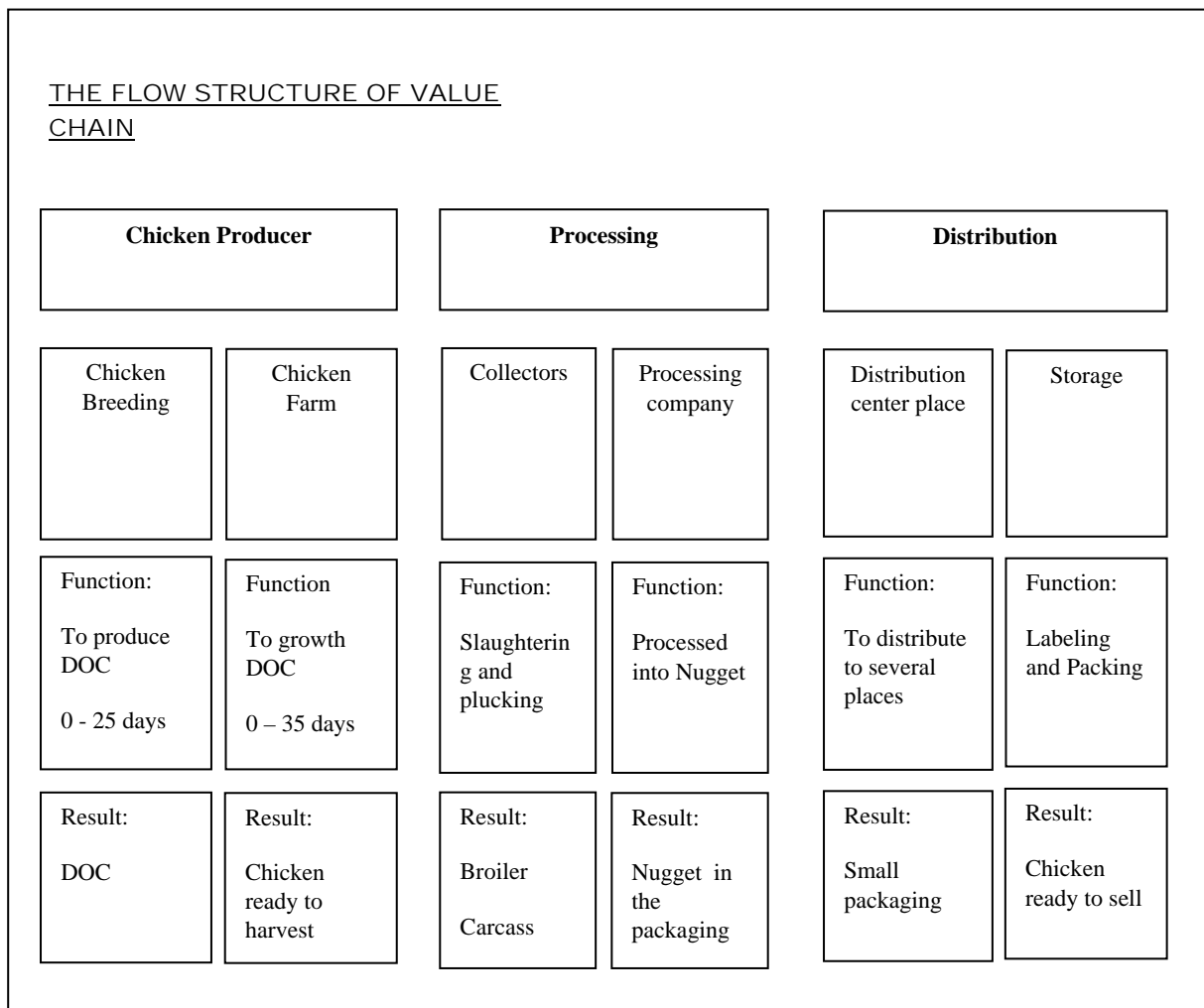


Figure 1. The flow structure of the value chain.

From the flow structure of the value chain above, the supply of value chain will be mapped again in the *Big Picture Mapping* in the broiler supply flow which can be seen in Figure.2 The big picture mapping of the broiler supply chain

BIG PICTURE MAPPING OF THE BROILER SUPPLY CHAIN

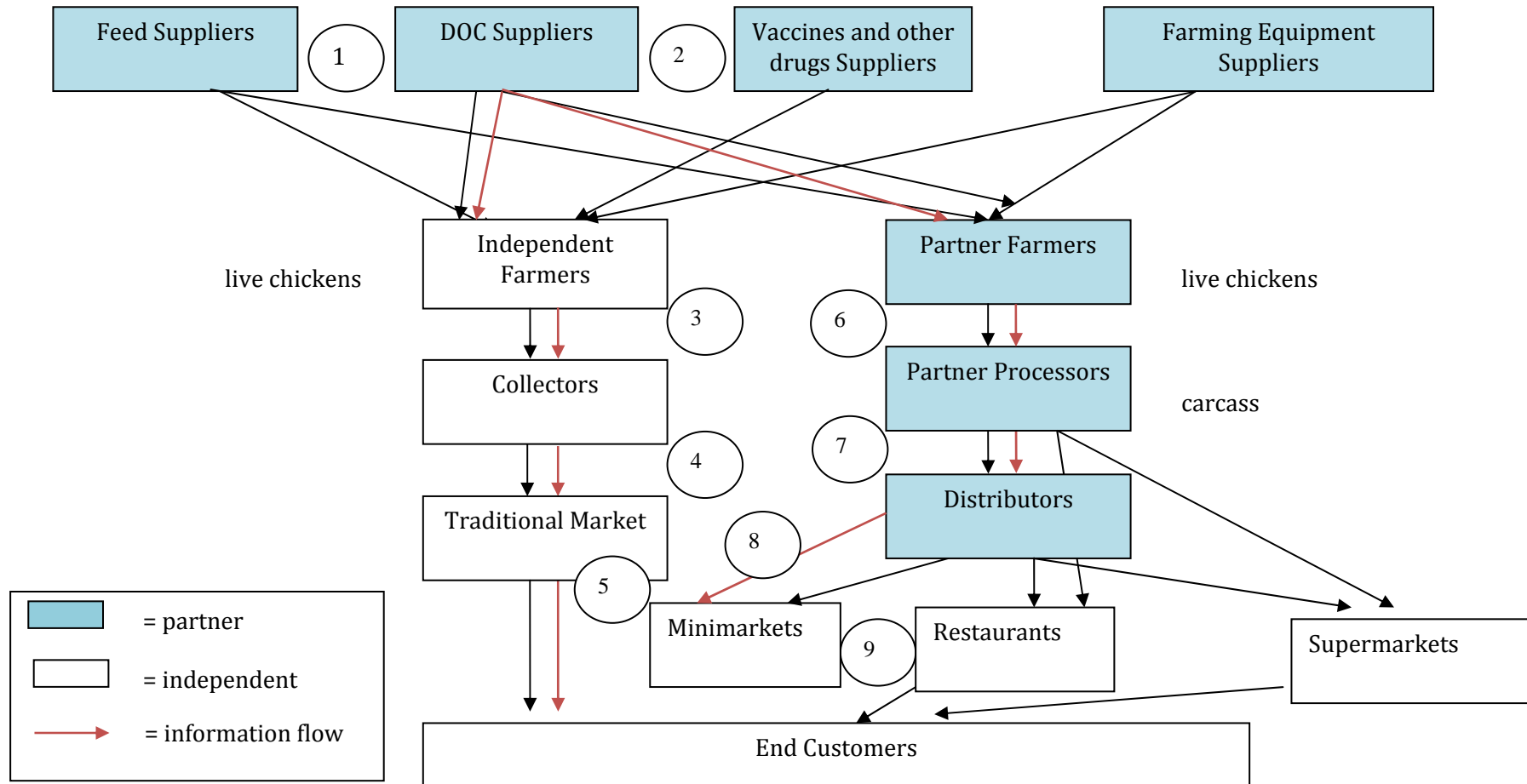


Figure 2. Big Picture Mapping of the broiler supply chain

From the big picture mapping flow above, it is obtained 9 information flows from the upstream to the downstream. Also, it is noted that there are 2 types of farmers involved in this chain flow, namely the independent farmers and the partner farmers. Both are different. The independent farmers bear the entire cost of their own husbandry so that the independent farmers have considerable risks. On the other hand, the partner farmers only have land and employee as their asset because from DOC, feed until the vaccine are supplied by the partner company so farmers have small risks.

Table 1. Information flow from Big Picture Mapping

No	Information	Processing
1	Purchasing of DOC and feed from suppliers	2-4 weeks (28 days)
2	Purchasing of vaccine and other drugs from suppliers	1-2 days
3	Information from farmers to collectors via phone about their harvest.	1 day
	Growing DOC in growth farms (independent or partner farms)	32 days
4	Buying chickens from collectors	1 day
5	Buying chickens from collectors in the traditional market	1 day
6	The partner farmers give the information about harvest to the partner processors	1 day
7	Distributing of the processor of the chickens to partner distributors	1 week (1-7 days)
8	Distributing from distributor partners to retail such as supermarkets, restaurants, coffee bar etc.	1 week (1 – 7 days)
9	End consumers get the end product the chickens	1 day

All of the process of the broiler supply chain at independent farmers require 65 days to complete. The partners farmers necessitate 78 days to complete all of the process of supply chain.

These days, the partner farmers are more numerous than the independent farmers. Then, in the each process of broiler supply chain flow, the added value will be analyzed by using Hayami's method as in Table 2. The analysis of added value.

Table 2. The analysis of added value by using Hayami's method

Variable	Value	Independent Farmers	Partner Farmers	Collectors	Nugget Processor
I. Output, Input and Price					
1. Output (pcs/kg)	1	15,548	5,920	1,600	2,560
2. Input (kg)	2	360	140	1,600	1,280
3. Employee (HOK)	3	4	2	11	8
4. Conversion factor	4= 1/2	43	42	1	2
5. Coefficient Employee (HOK0	5= 3/2	0.011	0.014	0.007	0.006
6. Output Price (Rp/Kg)	6	12,000	12,000	15,300	45,000
7. Direct Employee Salary	7	300	150	300	1,000
II. Income and Advantage					
8. Raw Material Price	8	62,500	19230	4000	47,031
9. Other Input Donation	9	431,596	1225	500	8,000
10. Output Value	10=4 x 6	518,267	507,429	15,300	90,000
11.a. Added Value	11a = 10-9-8	24,171	486,974	10,800	34,969
11.b. Added Value Ratio	11b=11a/10 x 100%	5%	96%	71%	39%
12.a. Direct Employee Income	12a= 5 *7	3	2	2	6
12.b. Employee Segment	12b = 12a/11 a x 100%	0%	0%	0%	0%
13. a. Advantage	13a = 11 a-12a	24,167	486,971	10,798	34,963
13.b. Advantage Level	13b = 13a/11 a x 100%	100%	100.0%	99.98%	99.98%
III. Services Reply of Production Factors Owner					
14. Margin	14= 10-8	455,767	488,199	11,300	42,969
14.a. Direct Employee Income	14a=12a/14 x 100%	0.001%	0%	0.018%	0.015%
14.b. Other input Donation	14b= 9/14 x 100 %	94.7%	0.25%	4.42%	18.62%
14.c. Company Owner Profit	14c= 13a/14 x 100%	5.3%	99.75%	95.56%	81.37%

From the calculations of the added value analysis above, it is known that the independent farmers have Rp. 24.167 per kg raw material of advantage and 100 % of advantage level. Partner farmers have Rp. 486.971 per kg raw material and 100 % of advantage level. The collectors have Rp. 10.798,00 per kg raw material and 99,98 % of advantage level. Nugget processors have Rp. 34.963, 00 per kg raw material and 99,98 % advantage level.

CONCLUSION

1. From the results of this study, it can map the supply chain of broiler agribusiness by using the value chain analysis approach proved by the figure of the Big Picture Mapping.
2. From the results of big picture mapping, it can be seen the member of the value chain. Among them, there are several industries as suppliers of raw materials (DOC, feed, medicines and vaccines, as well as livestock equipments), the farmers, the collectors, the partner processors, the retailers and the traders in the traditional markets.
3. From the analysis results of added value of each member of supply chain using the Hayami's method, it is known that the independent farmers gain 100% of advantage percentage the advantage, the partner farmers gain 100%, the collectors gain a 99.98% and the processors of nuggets processing gain of 99.98%.

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