

Supply Chain Analysis Of Cemani Chickens In Temanggung, Central Java, Indonesia

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Abstract: *This study aimed to determine the supply chain of Cemani chicken in Temanggung, Central Java, Indonesia. The method used in this study was survey method with purposive sampling and snowball sampling. Data in this study were analyzed descriptively. Results showed that there were 4 channels of the supply chain of Cemani chicken in Temanggung. Product flows from farmer to the customers. Information and financial flows from customer to the farmers. The most efficient marketing was direct market from farmer to customer (channel IV). This study suggests that farmers need to maximize the usage of social media as marketing media to expand the market. Improvement in shipping transportation also needed to decrease the mortality risk.*

Keyword: *financial flow, Indonesian local chicken, information flow, marketing efficiency, products flow*

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I. Introduction

1.1 Background

Indonesia has a wide variety of biodiversity, one of them is local chicken which is counted to about 32 breeds (Nataamijaya, 2000). Black Kedu chicken is one of the local chicken which is originated from the Temanggung, Central Java. Black Kedu chicken has specific characteristics indicated by black color on all of the feathers and even black color on their whole body including skin, meat, bones, beak, cloaca, comb, face and legs. Black Kedu chicken is locally known as Cemani chicken. Dorshorst (2012) explained that the black color in the body of Cemani chicken is a result of a genetic mutation in the form of duplication in the genome area which consisting of 5 genes, which then cause fibromelanosis or hyperpigmentation. One of the genes contained in those areas of duplication is Endothelin3 (EDN3) which plays a role in the formation of melanocyte-producing proteins. Cemani chicken has a broad market prospect, not only limited to the local market, but also to the global market (Tjahjadi, 2010). In addition to the use as a pet, Cemani chicken is also used as a medicine and complement of the traditional ceremony (Muladno, 2008).

The current business situation of the Cemani chicken is not comparable with existing opportunity. Cemani chicken farming in Temanggung District is still traditional and their definite supply chain has not been identified. According to Kotler and Armstrong (2013), supply chain management is to control and build a long-term satisfactory working relationship with key stakeholders such as customers, distributors, and suppliers, to maintain their long-term preferences and business. Rainer et al (2011) explain that there are three flows in the supply chain, including products flow, financial flow, and information flow. This study aimed to determine the supply chain of Cemani chicken in Temanggung, Central Java, Indonesia.

II. Material And Methods

2.1 Location and time

This study was carried out at Cemani chicken farming, Kedu Subdistrict, Temanggung District, Central Java Province, Indonesia. The selection of location was done with a purposive method, according to the consideration that the center of Cemani chicken farming in Indonesia was located in Kedu Subdistrict, Temanggung District, Central Java Province, Indonesia. This study was conducted on November 2017.

2.2 Methods

The method used in this study was survey method. This method takes samples from a population and uses questionnaires as a means of data collection. Determination of farmer respondent was done by purposive sampling. A farmer who selected as respondent was Mr. Nur Faizin. This selection was based on several considerations. First, Mr. Nur Faizin Head of Makukuhan farmers' group who had Cemani chicken farming which consisted of 5 parental groups (each group consisted of 1 male and 4 females) and 70 chicks. Second, Mr. Nur Faizin was often winning the contest of Cemani chicken. Third, Mr. Nur Faizin often became an informant for other farmers because he was a conservationist of Cemani chicken in Kedu village. Whereas, the determination of the seller and end-customer respondents were conducted by snowball sampling. The sellers and customers were chosen by tracing the supply chain channel owned by Mr. Nur Faizin in Java Island.

2.3 Data collection and analysis

Data of product, information and financial flow was collected from the farmer, the seller and the customer, which were obtained through interviews, questionnaires and direct observation in the field. Data were then analyzed descriptively. Analysis of financial flow was added by the analysis of profit margin and efficiency.

Farm-gate price was taken from sellers' purchase price of chickens at farmer level, While profit margins calculated by subtracting purchasing prices and transaction costs from the selling price (Gondwe et al 2003). Marketing efficiency was calculated using Shepherd Method: $ME = (V/I) - 1$, where V = value of cemani chicken in customer (per bird) and I = total marketing cost (Shepherd, 1965).

III. Result

Results of products flow, information flow and financial flow of Cemani chicken in Temanggung, Central Java, Indonesia is showed in Figure 1.

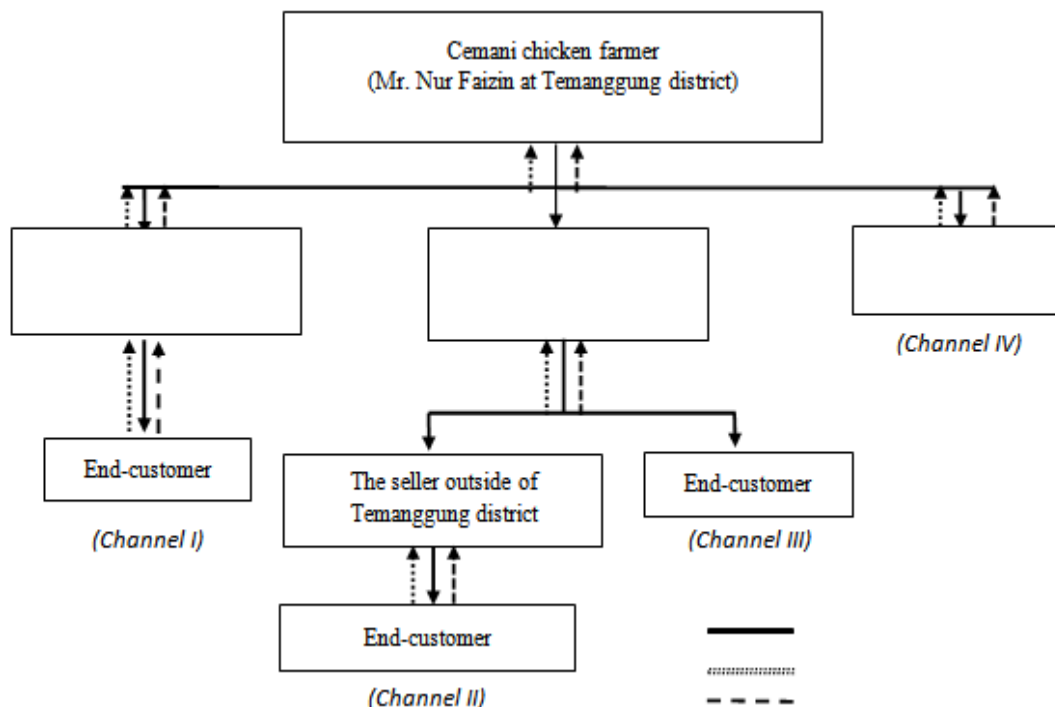


Figure 1. Supply chain of Cemani chicken in Temanggung, Central Java, Indonesia

3.1 Product flow

Farmer: Mr. Nur Faizin reared various ages of Cemani chickens ranging from one-day-old to the breeder. Cemani chickens also had two grades. The first grade of Cemani chicken had good posture and black tongue color, this type had an expensive price. The second grade of Cemani chicken had a good posture with gray tongue color, this type had an affordable price, so this type was more preferred by customer. Feed, vaccines, vitamins, and medicines were supplied by a poultry shop located in Kedu market, approximately 1 kilometer from Mr. Nur Faizin's farm.

Cemani chicken farming had no particular supplier for parent stock. The farmer prepares parent stock based on the results of the existing selection on their farm and also by buying from the other farmers. The specifications of Cemani chicks ordered by each customer was differ depending on the customer needs. Cemani chicks were packed by using plastic baskets equipped with cardboard pads and supplied with enough feed and drinking water. The packaging of Cemani chicken eggs were done by using a wooden box equipped with the sponge. The shipment of Cemani chicks and eggs for Java area were done by using an inter-city bus, because of the cheaper price and quicker time. On the other hand, for the shipment to the out-of-town, which required more than 24 hours, was done by using a special cargo for animals.

Seller: The sellers who cooperated with Mr. Nur Faizin were coming from inside and outside of Temanggung district. The seller from the inside of Temanggung district was come directly to the Mr. Nur Faizin's farm to choose the chicken which suitable with customer orders. After getting the appropriate chicken, the seller usually contacts the customer to ensure the price and quality of chicken. Then, the chicken will be delivered or taken directly by the customer or second level of the seller.

The seller from outside of Temanggung district usually orders by phone or other social media. Cemani chickens which were shipped by using an inter-city bus taken by the seller at the bus station. Before delivered to the end-customer, the seller checked whether the chicken was in accordance with the desired specifications or not. Then, the chickens were fed and supplied with the brown sugar solution to replace the energy loss during the shipment. The seller ensured that the chicken had a good condition to be given to the end-customer. The shipping baskets were also cleaned from manure and feed residue. Cemani chicken was then delivered to the customer's home or taken directly by the customer at the seller's home.

3.2 Information flow

Information flow is a flow that occurs both from the customer to the farmer and vice versa. The information contained in the supply chain of Cemani chicken including the amount of demand, order systems, criteria and quality of Cemani chicken, promotion and facilities. Information flow can be vertical, i.e. coordination among different level of marketing agents such as among the farmers, the seller, and the customer. Information flow can also work horizontally, i.e. coordination among the equal level of marketing agents, such as among the farmers.

Farmer: Mr. Nur Faizin bought the feed for Cemani chicken in poultry shop every two weeks due to the limited capacity of warehouse and to minimize the risk of mold growth in the feed. Mr. Nur Faizin accepted the order of Cemani chicken through social media such as WhatsApp or Facebook, phone, text message and some customers come directly to his farm. At the beginning of his business, Mr. Nur Faizin marketed Cemani chicken conventionally, by displaying the chicken inside the cage in the front of his house on Kedu Street no. 6. Moreover, along with the technological advances, he marketed Cemani chicken through social media assisted by his son. Word of mouth from the customers who have bought Cemani chicken in Mr. Nur Faizin's farm, made other customers also come to his farm and then Mr. Nur Faizin was known as a chairman of Cemani chicken farmer in Kedu Village.

Information flow that occurs between the farmer and seller including the availability of Cemani chicken which was in accordance with the criteria ordered by the seller. If Mr. Nur Faizin had no chicken which met the demand of the seller, he will look for a suitable chicken from other farmers. However, during November 2017, Mr. Nur Faizin's farm can fulfill all of the seller's demand. Generally, the criteria desired by customer were age, sex, and the most important one was the level of black color in the chicken's body (grade).

Table 1. Demographic characteristics, location of sellers and customers and purpose of purchase of Cemani chicken in Temanggung, Central Java, Indonesia.

Parameters		The number of chickens sold
Sex	Male	31
	Female	50
Grade	Grade I	2
	Grade II	79
Age	2 months	20
	3 months	36
	4 months	10
	5 months	10
	8 months	5
Location of Sellers	Inside Temanggung	6
	Outside Temanggung	60
Direct Customers	Outside Temanggung	21
Location of Customer	Inside Temanggung	-
	Outside Temanggung	81
Customers' Purpose of Purchase (number of customers)	Hobby	16

	Medicine	2
	Traditional ceremonies	2

The price given by Mr. Nur Faizin was different for every customer, depend on the type of customer, the amount and purpose of purchase, and the location of the customers. The ornamental chicken market which focused on the quality and customer needs had very high price compared to the price of chicken destined for consumption (Bubphapant, 2017). The purchase of Cemani chicken in Mr. Nur Faizin’s farm was dominated by customers who bought as ornamental chicken (hobby) with 80%, 10% for medicine, and 10% for traditional ceremonies (Table 1). The price offered was still negotiable until meeting the price agreement between both parties. The shipment of Cemani chicken was done by using inter-city bus. Mr. Nur Faizin provided after sales service to all of his customers. Mr. Nur Faizin will replace the chicken if it was died during the shipment until one day after it was accepted.

Seller: Cemani chicken seller inside the Temanggung district marketed the chicken by either offline or online. The seller who use offline marketing, they were renting a kiosk in Kedu-Parakan Street and displaying Cemani chicken inside the cage. They post a note “Selling Cemani chicken” on the board placed in the front of their kiosk. The seller who use online marketing, either the seller inside or outside of Temanggung district, they were using social media such as Facebook and WhatsApp to market the Cemani chicken. The seller received an order from the customer then informed it from the farmer. After the price agreement, the customer can pay and bring the Cemani chicken if the customer came directly to the seller’s kiosk. However, if the customer was in the outside of Temanggung district, the seller will send the image of chicken through social media and when it was agreed, Cemani chicken will be sent by using the agreed shipment service. The seller also offered the different prices for each customer, depending on the purpose of Cemani chicken purchase, whether used as a treatment, traditional ceremonies, or reared and then the origin of the customer was also became a consideration. In addition, chicken's age and /grade also greatly affect the price. The seller also provided after sales service to the end-customer. The seller will replace the chicken if the chicken died due to travel or ill until a maximum of one day after accepted by the customer.

3.3 Financial flow

Farmer: Payment for the seller and customer who came to Mr. Nur Faizin’s farm were done by cash and carry, it means that the chicken can be brought by the seller and customer after the payment was made. While for the seller and customer who were on the outside of Temanggung district, the payment was done through the bank transfer. Cemani chicken will be sent after payment received by Mr. Nur Faizin. The payment for the seller and customer who were on the outside of Temanggung district were the price of Cemani chicken added with the shipping cost.

Seller: The seller inside of Temanggung district marketed Cemani chicken in a kiosk on Kedu - Parakan Street, a strategic location to make people can easily find Cemani chicken. The customer can make payment by cash and carry if the seller had a chicken which was suitable specification. The customer from outside of Temanggung district made a payment by bank transfer first and then the chicken will be sent.

The seller outside of Temanggung district usually gets order from people around their area. When they were getting an order from the customer and the desired specifications were available in the farmer or in the seller inside of Temanggung district, they will determine the price. The seller outside of Temanggung district paid the farmer or the seller inside of Temanggung district according to the agreed price.

3.4 Marketing margin

Marketing margin is the difference between the selling price and the purchasing cost. The purpose of marketing margin analysis is to demonstrate the relative importance of marketing costs to express the real differences between and between markets (market variations) to enable further market integration (FAO,2011). The marketing margin in this study was calculated on each marketing agents (Table 2). The results showed that channel III had the highest marketing margin among the three other channels. The middleman got the customer who used Cemani as a medicine and would like to pay with high price if the middleman can fulfill the specification demand.

Channel II and Channel I had the second and third highest marketing margin, respectively. In the Channel I, the seller outside of Temanggung became a middleman between farmer and end-customer. In this case, the seller outside of Temanggung directly delivered Cemani chicken to end-customer and not spend any cost of renting kiosks for selling. The type of Cemani chicken sold in this channel was the second grade, so the selling price was not as high as the first grade. Moreover, the number of Cemani chicken purchased by the seller outside of Temanggung was in sufficient quantities, so the seller did not take too much profit for each Cemani chicken sold. On the other hand, the lowest marketing margin was channel IV because it did not use any

marketing agent to market the product. The pricing of Cemani chicken was affected by the conditions, events, and specification of customers' need.

Table 2. Marketing margin, efficiency and farmer's share

Marketing agents	Marketing channel							
	Channel I IDR/bird	%	Channel II IDR/bird	%	Channel III IDR/bird	%	Channel IV IDR/bird	%
<i>Farmer</i>								
Production cost	115,052	32.1	22,046	5,51	99,790	4.99	167,504	32.4
Marketing Cost	3,290	0.918	2,901	0,73	2,901	0.15	4,346	0.84
Profit	159,991	45	25,210	6,30	400,210	20	344,817	66.7
Selling price	278,333	77.7	125,000	31,3	500,000	25	516,667	100
<i>Seller inside of Temanggung</i>								
Purchasing cost			125,000	31.3	500,000	25		
Marketing cost			25,000	6.3	124,167	6.21		
Profit			100,000	25	1,375,834	68.8		
Margin			125,000	31.3	1,500,000	75		
Selling price			250,000	62.5	2,000,000	100		
<i>Seller outside of Temanggung</i>								
Purchasing cost	278,333	77.7	250,000	62.5				
Marketing cost	11,367	3.17	22,125	5.53				
Profit	68,633	19.2	127,875	32				
Margin	80,000	22.3	150,000	37.5				
Selling price	358,333	100	400,000	100				
Total marketing cost	11,367	3.17	47,125	11.8	124,167	6.21	4,346	0.84
Total profit	68,633	19.2	227,875	57	1,375,834	68.8	344,817	66.7
Total margin	80,000	22.3	275,000	68.8	1,500,000	75		
Farmer's share (%)	77.7		31.3		25		100	
Marketing efficiency	30,524		7,488		15,107		117,883	

3.5 Marketing efficiency

Marketing efficiency is one of the indicators to measure the success rate of a supply chain. Daniel (2002) stated that the marketing system can be categorized as efficient if able to distribute products from producers to customers with minimal cost. In addition, efficient marketing can also be achieved if the overall price paid by the last customer was shared fairly to all parties who participate in the production and marketing activities.

Table 2 shows the marketing margins, efficiency, and farmer's share for each channel. Channel I was a distribution channel that involves only a middleman namely the seller outside of Temanggung district. Channel II involved two middlemen, the first one was the seller inside of Temanggung district and the second one was the seller located at the outside of Temanggung district. Channel III involved a middleman namely the seller inside of Temanggung district. The last channel was channel IV which was a zero-level channel because the farmer sold the chicken directly to the end-customer.

The most efficient marketing can be seen on a channel with the lowest marketing cost. Based on the result of research. Channel II was a marketing distribution channel that had the lowest value of marketing efficiency. Channel II had more marketing agents than other distribution channels. Channel II involved the seller inside of Temanggung, then further marketed by the seller outside of Temanggung and then to the end-customer. The value of marketing efficiency for this channel was 7,488, with the lowest profit for the farmer. The longer chain of distribution channels of a product could give a higher price to be paid by the end-customer. It is in accordance with Daniel (2002), who stated that the longer distance and the more middleman involved in marketing could cause higher marketing costs. The most efficient channel was direct selling from farmer to customer in channel IV.

IV. Conclusion

1. There were 4 channels of Cemani chicken supply chain in Temanggung. Channel I started from the farmer, the seller outside of Temanggung, and then to the end-customer. Channel II started from the farmer, the seller inside of Temanggung, the seller outside of Temanggung, and then to the end-customer. Channel III started from the farmer, the seller inside of Temanggung, and then to the end-customer. While in Channel IV, the farmer directly sold the chicken to the end-customer.
2. Product flows from farmer to the customers. Information and financial flows from customer to the farmers
3. This study suggest that farmers need to maximize the usage of social media as marketing media to expand the market. Improvement in shipping transportation also needed to decrease the mortality risk

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