



**CONTRACT FARMING AND TRANSACTION COST IN DAIRY INDUSTRIES
IN EAST JAVA – INDONESIA**

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ABSTRACT

This study is a post-positivist paradigm phenomenologyc-interpretive research. It was conducted to provide an overview on how contract farming between dairy farmers and dairy cooperative is developed and what issues and challenges are faced in this contract partnership. This study also aimed to analyse the transaction cost arise in the contract. Face-to-face interviews using semi structured-questionnaires were carried out with 87 contract dairy farmers located in the districts of Malang, Batu and Pasuruan in East Java Province. Result of the study shows that the practice of contract farming raised the transactioncost in the dairy cattle business resulting an increase in total cost. However, the practice of contract farming has improved the production skills of farmers, provided access to credit and guarantee market for their milks. In addition, the productivity and efficiency of dairy farmers can be further improved by introducing good farming practices through an improvement on farm management practices including the provision of inputs, transportation, extension services, and technological support.

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INTRODUCTION

Contract farming system has been widely recognized and practiced in some regions in Indonesia as a model and mechanism of partnership between farmers and buyers (industries) to procure a specific quality and quantity of agriculture product under forward agreement. The practice generally shows positive results, among others are providing economics benefit to the parties involved in the partnership (Erfit, 2011; Saptana & Indraningsih, 2006), a better life for the farmers, technological support, access to credit –either in cash or in kind (eg. seeds, fertilizer, etc.) and market access (Andri, 2005; Daryanto, 2007) and also has a multiplier effects for the economy in rural and in a wider scale (Saptana & Indraningsih, 2006). Therefore, the existence of contract farming is considered has the potential to improve the performance of farmers and solve some of their problems.

However, contract farming also raises criticism. Unequal bargaining power between farmers and large agribusiness firms, more often, puts farmers in a "lose" position and may lead to exploitation of farmers by large agribusiness firms (Erfit, 2011; Minot, 2017 and Singh, 2002). These can be seen from the dominance of the buyer in determining the price, quantity and quality of commodities produced, the schedule of planting and harvesting, the technology used and so forth without involving the participation of farmers.

The firms may break the contractual terms at the expense of the farmers and push the small farmers out of the market, creating more poverty among rural small farmers (Kaur *et al*, 2015). In this case, the imbalance of power between the two sides led to the agreement not benefiting the farmers. There are some other problems in the contract farming, including payment delays, manipulation of grades of produced commodities by buyers, high input cost, production failures, price fluctuations, and so on (Nagaraj *et al*, 2008 and Daryanto, 2007).

The absence of small farmer participation in the contract establishment makes the situation worsened. Small farmers are often excluded from agricultural contract schemes. Buyers in general, are more willing to work and make a contract only with larger farmers rather than with small farmers. Working with smaller farmers will lead to high transaction costs for maintenance and supervision because they are numerous and scattered in various places (Andri, 2006). As was stated by ADB (2015) that the cost to buyers for making contracts with individual small famers are very high when compared to the cost of handling large-scale farmers. Transaction costs associated with negotiations, technical assistance, quality monitoring, and harvesting will definitely decrease if the buyer works with a smaller number of larger farmers (Minot, 2007). Therefore, it is not supprising if the buyers would rather prefer to work with a smaller number of larger farmers than a large number of small-scale farmers.

However, the existence of the transaction costs cannot be avoided in various economic activities including dairy

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business. Items such as milk are easily damaged without cold storage or ease of market access, and therefore are associated with high transaction costs. This condition normally leads dairy farmers to have limited marketing flexibility as they are often in an unfavourable bargaining position. In order to improve the bargaining position of small farmers, they should access the market collectively through intermediary agent. In this case, cooperatives are considered to be an appropriate agent to reduce transaction costs and to facilitate access of small-scale farmers to their buyers.

In this paper, we try to identify the transaction costs incurred in dairy farming and address some of the factors underlying the success of dairy farming contracts. This paper is divided into four sections. The first section highlights the background of the study, followed by the literature review. The third section is discussing about the methodology used in the study followed by result and discussion. Lastly, this paper ends up with conclusion and suggestion for future research.

LITERATURE REVIEW

Definition of Contract Farming

Eaton and Shepherd (2001) defined contract farming as an agreement between one or more farmers and a buyer for the production and supply of agricultural products under agreements, frequently at pre-determined price. While Setboonsarn (2008:2) defined contract farming as a contract between a farmer and a purchaser established in advance of the growing season for a specific quantity, quality, and date of delivery of an agricultural output at a price or price formula fixed in advance. Under this agreement, the buyer commits in advance to buy a specified product at pre-determined price and may provide support to production process (technical guidance, credit, extension and training) and inputs (seeds, fertilizers, pesticides) to farmers (Will, 2013) and in return, farmers have an obligation to produce a specific agricultural product at a quality standards and quantity agreed sold exclusively to companies (Setboonsarn, 2008).

Hence, in this contract, the buyer have a guarantee supply of certain commodity at quantity and quality standard agreed on, access to labour and land to grow the high value agricultural products (Saptana & Indraningsih, 2006) and transfers any production risks onto farmers (Prowse, 2008). For agribusiness firms, contract farming is an important means to have an assured access to desired products with a quality, quantity and price based on their needs without actually engaging itself in farming. The basis of such an agreement is a commitment on the part of the farmer to provide a specific commodity in quantities and at quality standards determined by the purchaser and a commitment on the part of the company to support the farmer's production and to purchase the commodity. From the point of view of farmers, contractual arrangements can provide them with access to production services and credit as well as knowledge of new technology, while pricing arrangements can reduce risk and uncertainty.

Types of Contract Farming

According to Eaton and Shepherd (2001:2), contract farming is divided into five models. These models differ in the type of contractor, the type of product, their intensity of vertical coordination between farmer and contractor, and the number of key stakeholders involved. Those are:

- The Centralized model, can be considered as a classical contract farming model. There is a strict vertical coordination in this model, quality of the product is tightly controlled and quantity is determined at the beginning of the growing season.
- The Nucleus Estate model, the contractor not only sources from independent farmers but also has its own production facilities (an estate plantation). The central estate is usually used to guarantee throughput for the processing unit but is sometimes used only for research and breeding purposes.
- The Multipartite model, a joint venture between a statutory body and a private company contracts with farmers.
- The Informal model, is characterized by individual entrepreneurs or small companies contracting informally with farmers on a seasonal basis, particularly for crops such as fresh fruits and vegetables.
- The Intermediary model. There are at least three parties in this model: a processor or major trader formally contracts with a collector (or middlemen) who then informally contracts with a number of farmers.

Transaction Cost

Classical/neoclassical economics assumes that transactions are free of cost. In other words, transaction could occur based on market mechanism without paying any costs. This view contradicts recent institutional economics thought which has opposite assumption. Market will not function perfectly if economic actor does not have information about goods which will be traded. Therefore, some economists are convinced that transaction can go on if the required information exists. However, collecting information needs cost. Therefore, assumption stated that transaction could proceed without any cost becomes irrelevant. In that case, transaction costs become important analysis unit in institutional economics.

According to Williamson, transaction costs are the cost of running the economic system and the cost of adjusting to environmental changes (Challen 2000, as quoted by Mburu, 2002: 41). Or in other words the transaction cost is the cost to negotiate, measure, and impose the exchange. While according to Mburu (2002: 42), transaction costs can also be interpreted to include three broader categories namely:

1. Search and information costs
2. Bargaining costs and decisions or execution of contracts;
3. Cost of monitoring (monitoring), coercion, and fulfillment / implementation (compliance).

Classification of Transaction Costs

According to Furubotn and Richter (2000), types of transaction costs are as follows:

Market transaction cost

All costs incurred so that goods / services can reach the market, including contract preparation fee (search fee / procurement information); contracting costs (bargaining / negotiation and decision-making costs); monitoring and enforcement costs (supervision fees and enforcement of agreements). Some other market transaction cost are cost of information, advertising costs, coming to potential customers, following exhibitions, weekly markets, communication costs

(post, phone, etc.), quality testing costs, looking for qualified employees.

Managerial transaction cost

Costs associated with running the organization (creating order in organization). For example: the cost of creating, maintaining or changing the organizational structure, personal management costs, IT, public relations, and lobbying. Some other managerial transaction costs are the cost of decision-making, supervision of the implementation of orders according to decision, measuring employee performance, agency costs and information management cost.

Political transaction cost

Costs related to the making of rules and regulations in an organization so that market and managerial transactions can take place properly. Some of political transaction costs are set up costs, maintenance, alteration of formal and informal political organizations, the costs of establishing a legal framework, the structure of government administration, the military, the education system, the courts and others. The cost of community involvement in the political process is included in political transactions.

Characteristics and Factors Affecting Transaction Costs

Companies, bureaucracies, organizations, and others are regarded as a governance wherein there are transactions / interactions between individuals / sections. Transactions with outside parties (outside of governance) are influenced by higher level external institutional environments. Changes in the external institutional environment affect transactions that occur between individuals / parts of governance. Transactions in a governance are also influenced by the nature of individuals who tend to opportunistic, self interest, greedy and others. Transactions that occur are influenced by the internal and external institutional environment. The more complex the transaction the more expensive the cost.

According to Williamson (1981), there are three important transaction characteristics that affect the amount of transaction cost, namely: 1) uncertainty, especially related to production, supply, demand, price fluctuation, climate, livestock condition, and field condition; 2) frequency, depending on the circumstances and production capability. Agricultural products, livestock, fishery, are highly dependent on the season. Transactions on high milk production on rainy season are different from transactions in low milk production on famine season. 3) Specificity, which includes site specificity, physical asset specificity, human asset specificity. Specific assets restrict certain activities that have limited transactions. These three characteristics are related to asymmetric information.

While Zhang (2000), identifies the factors that affect transaction costs, as follows: 1) the characteristic of the object and the right to the object (related to information about the person's object and status of the object); 2) the identity of the actors involved in the transaction (regarding the limited human nature, ie the limitations of people in seeking, receiving, storing, processing information, lack of information); and 3) the technical and social situation of exchange arrangement and how the exchange is managed. Whether the exchange is only due to market forces or institutional interventions that help organize such exchanges.

While Beckman (2000) formulates four factors affecting the amount of transaction costs:

1. Attributes of attached actors / actors (limited rationality and opportunism) determine the amount of the transaction.
2. Properties / attributes of transactions (asset specificity, uncertainty, frequency).
3. Affected matters relating to governance (market, hierarchy, hybrid, regulation, etc.).
4. Institutional environment (property rights, contracts, agreements, culture, etc.)

Research Methodology

This is a qualitative research based on post-positivist paradigm phenomenological-interpretive. Data were collected by using in-depth interviews, questionnaires, observation and was strengthened by secondary data from a variety of sources including dairy farmers, officials of dairy cooperatives and milk processing industry in East Java Province, Indonesia. The samples were selected based on stratified random sampling, that is, the respondents were grouped based on the category of the status of capital ownership, then grouped again based on business scale. The dairy farmers were categorized into independent farmers and credit farmers, while business scale was grouped into small, medium and large scale business. The samples used in this research were 87 respondents and the number was selected proportionally.

The Findings

The Dairy Industry in East Java

Dairy is one of important industry in Indonesia, consist of over 192,160 dairy farmers managing about 3 cows in average, or over 500,000 dairy cows in total. Ninety seven percent (97%) of all dairy cows are located on the island of Java in the provinces of East Java, Central Java and West Java. Of these three provinces, East Java being the largest milk producer accounting for 57 % of Indonesia's milk production. Almost 60% of all dairy cows in East Java are located in the regencies of Pasuruan and Malang. East Java is considered to be a very potential area for the expansion of the dairy cattle, due to the availability of livestock, the geographical, ecology, and the fertility of the land makes it suitable for the expansion of the dairy cattle. The following table is the dairy population and milk output by main provinces.

Table 1 Dairy Cows Population and Milk Output by Main Provinces

Province	Dairy Cows (Numbers)	Dairy Cows (Percentage)	Milk Production (tons)	Milk Production (Percentage)
East Java	323,814	50.90	560,398	57.09
Central Java	154,398	24.27	107,982	11.00
West Java	143,382	22.54	293,107	29.86
Others	14,470	2.27	20,099	2.04
TOTAL	636,064	100	981,586	100

Source: Livestock Statistics, 2013

In the period of 1980 - 2016, milk production growth in Java reached 8.43% per year, with the highest increase in 2010 of 87.44% or 420.66 thousand tons from 2009. The development period of 2012 - 2016, milk production actually decreased with the average yield decreased by 1% per year or decreased to 840.43 thousand tons. The development of milk production

outside Java Island from 1980 to 2016 showed an average increase of 6.95% per year. But in the last 5 years period showed a decline of 3.05% per year.

The dairy industry in Indonesia is dominated by a number of large players: Frisian Flag/Foremost, IndoMilk/ Indolacto. UltraJaya, Nestle and Greenfields. The market share and the volume of milk needed can be seen in the following table.

Table 2 Major Milk Processors in Indonesia

Milk Processors	Volume (million litres/year)	Market Share (%)
Nestle Indonesia	162	35.8
Frisian Flag Industries	123	27.1
Indomilk/Indolacto	68	15.0
Ultra Jaya	30	6.6
Sarihusada	12	2.7
Others (incl. Danone)	58	12.8
Total	453	100

Source: Wouters, 2009

Currently, consumption of milk in Indonesia is still low compared to other countries which only ranged in 11.8 liters / capita / year including processed products containing milk. Compared to other countries, Indonesia's dairy condition still needs more intense attention. In neighboring countries such as Malaysia, milk consumption reaches 36.2 liters / capita / year, Myanmar reaches 26.7 liters / capita / year, Thailand reaches 22.2 liters / capita / year and Philippines reaches 17.8 liters / capita / year (Suwandi, 2016). Based on the Food Material Balance data, the availability of milk for consumption in the period of 2012 - 2016 consists of two types, namely domestic fresh milk and imported milk.

The availability of fresh milk and imported milk is 14.85 kg / capita / year with average growth for fresh milk is 0.93% per year or 2.98 kg / capita / year. Meanwhile, imported milk rose 4.78% per year or 11.87 kg / capita / year. The availability of milk in Indonesia, 79.93% supplied from imported milk, while domestic fresh milk contributes only 20.07% (Suwandi, 2016). In terms of price, the price of milk at the consumer level in 2008 - 2015 continues to increase, an average of 9.53% per year (Suwandi, 2016). In the last 4 years (2012 - 2015), milk prices increased by 6.45% per year, with the highest increase in 2014 of 17.32% from the previous year or from Rp 6,962 / liter to Rp 8,168 / liter (USD 0.52 - 0.61). This is a good indication for Indonesia's dairy sustainability. When viewed from the eyes of producers, the price at the producer or farmers level is still lower than the consumer price level.

The Dairy Supply Chain

The following actors are active in the formal dairy supply chain in Indonesia:

1. Milk producers
2. The primary dairy/ village cooperatives (KUD)
3. The overall dairy cooperative (GKSI)
4. The milk processors/ dairy industry
5. The government (Ministry of Agriculture and its departments).

To sell their milks, dairy farmers in East Java, mostly have three marketing channels: selling (i) to the dairy cooperatives, (ii) directly to the consumers and (iii) to intermediaries (traders).

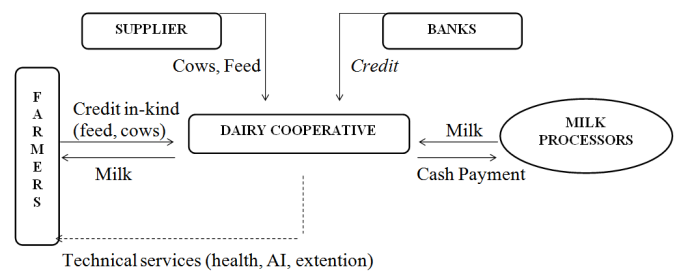


Figure 1 The Milk Flow in The Formal Dairy Supply Chain

These cooperatives, as the main buyer of milk, purchases fresh milk from farmers based on graded milk prices at the contract price and collect the milk at the cooling facilities and thereafter transported to the dairy plants. The cooperatives also provide inputs, credit in kind (concentrate feed and cows), veterinary services and AI (Artificial Insemination) services to members. The services are paid collectively through collective deduction from the milk price. While technical services, usually are provided by dairy industry which concentrated particularly on improvement of milk quality (technical assistance, equipment at collection centers etc.). In East Java, Nestlé assists cooperatives with provision of cooling equipment at collection points and centers, training of farmers, and feed supply. Usually farmers send their milk in the morning and in the evening to the nearest PPIT by their own transportation. The sample of milk will be sent out for quality assessment and then graded. The price will be determined based on the grade and ranges from IDR 4,400 (USD 0.33) to IDR 4,700 (USD 0.35) per litre depending on the region. The price offered by cooperative rarely fluctuated and can be constant within a year. However, not all milk is tapped by the cooperatives, small volume of milk (about 10% of total milk volume) is sold locally directly to consumers or intermediaries (traders, hotels and restaurants). Even though the farmers who sell their milk directly to consumers or the intermediaries can get a higher price, they prefer to sell their milk through cooperatives as cooperative offers various facilities and guidance. The price range is between IDR 6,700 (USD 0.50) to IDR 7,000 (USD 0.53) per litre. The buyer (consumers and intermediaries) will collect the milk at the farm, therefore, the farmers will not incur any transportation cost of delivering the milk. In addition, they can negotiate a reasonable price and receive immediate payment from the buyer who is willing to pay a higher price if the milk has a good taste and appearance. However, it is important to note, that under the direct selling marketing channel, buyer and seller generally have an informal (oral) agreement without any written contract. The drawback of this informal agreement is that the agreed transaction can unexpectedly be changed. Once an agreement is terminated, more time is required to find new buyers for the milk. Furthermore, if farmers decide to sell their milks directly to consumers or traders, they are not allowed to buy concentrate from the cooperative as the concentrates are sold only to the cooperative's members and the farmers will not enjoy free facilities provided by cooperative such veterinary services and artificial insemination (AI).

Transaction Cost Structure of Dairy Farmers

Furubotn and Richter (2000) stated that transaction costs are the cost of using market (market transaction costs) and the cost of exercising the right to provide in-house orders (managerial

transaction costs). There is also a set of associated costs to mobilize and adapt to the political institutional framework (political transaction costs). For each of the three types of transaction costs are differentiated according to two types, namely 1) fixed transaction costs, ie specific investments made in preparing institutional arrangements; And 2) variable transaction costs, which are costs that depend on the amount and volume of transactions. When viewed from rights of ownership, livestock resources are private property resources where the ownership of resources and the distribution of rights to livestock resources are clearly defined. The concept of transaction costs used in this case is the transaction cost with a private property approach.

The type of livestock ownership in breeders of cooperative members can be divided into two, namely cattle purchased with their own capital and cattle purchased on credit. The farmers who purchased dairy cattle with their own capital pay a fee to clarify ownership of the dairy cattle owned. As for farmers who have livestock on credit, there is a contract cost for the use of dairy cattle that is determined on the credit contract of livestock and this contract will be expired in accordance with the time specified.

Credit transactions between livestock farmers and banks occur directly facilitated by the cooperative. For that the breeder incur transaction costs which includes costs in the context of identification, negotiation, and the making of contractual agreements. More specifically, the costs incurred in carrying out the identification, negotiation, manufacturing of livestock credit requirements, signing of contractual agreements and fees to make the filing of loan application requirements and contracts are included in the contracting costs category. Thus, contracting costs include not only the filing of credit applications, but also the resources required to reach agreement between the farmers and the bank.

Another cost for dairy farmers is the cost of insurance based on the amount of livestock credit received by farmers. The size of the insurance cost depends on the amount of approved credit, which is one percent of the total loan/ credit value. The cost of insurance is the cost of contracting (enforcement costs) that farmers must incur at the beginning of investment (owning livestock). According to Furuboth and Ritcher (2000), the costs incurred for carrying out contracts at the beginning of this investment constitute a fixed transaction cost. The value of a fixed transaction cost may change depending on the amount of loan / credit for the purchase of cattle, insurance cost, interest rate, and cooperative/ institutional policy.

In addition to fixed transaction costs, breeders also bear variable transaction costs, which are highly influenced by livestock conditions and the frequency of transactions in the production process. The two components of variable transaction costs found in dairy cattle farms in cooperative are the cost of raising livestock resources as well as the cost of milk delivery and feed search or production input.

Based on the transaction costs incurred by dairy farmers, there are four components of transaction costs in the cooperative, among others, contract costs, livestock and members' welfare funds, livestock raising costs and milk delivery costs and feed searches or production inputs. Contract costs are only issued by farmers who buy cattle on credit, therefore the total transaction costs incurred by credit breeders greater than independent breeders.

Table 3 Transaction Cost Components (IDR/day/unit)

Farmers	Business Scale	Contracting Cost	Members' Welfare	Maintenance Cost	Milk Delivery & Production input	Total
Credit	Small	94.85 (6.96%)	21.26 (1.56%)	888.89 (65.26%)	357.14 (26.22%)	1.362.14 (100.00%)
	Medium	50.05 (5.55%)	10.09 (1.12%)	493.83 (54.72%)	348.54 (38.62%)	902.52 (100.00%)
	Big	26.71 (3.22%)	4.67 (0.56%)	591.13 (71.31%)	206.48 (24.91%)	828.99 (100.00%)
	Average	52.07	10.69	582.38	316.83	961.97
	Percentage	5.41	1.11	60.54	32.94	100.00
Self Finance	Small	0.00	23.25 (2.95%)	476.19 (60.34%)	289.80 (36.72%)	789.24 (100.00%)
	Medium	0.00	10.74 (1.57%)	259.74 (37.94%)	414.21 (60.50%)	684.69 (100.00%)
	Big	0.00	5.12 (0.67%)	500.00 (64.99%)	264.25 (34.35%)	769.38 (100.00%)
	Average	0.00	15.00	378.35	344.45	737.80
	Percentage	0.00	2.03	51.28	46.69	100.00
Total (in Average)		26.04	12.84	480.37	330.64	849.88
Percentage		3.06	1.51	56.52	38.90	(100.00%)

It can be seen from the above table that the average transaction costs incurred by dairy farmers per day per unit of livestock is IDR849.88 (USD 0.063), where the average transaction cost of credit breeder amounting to IDR961.97 (USD 0.071) which is greater than the cost of transactions of independent breeders amounting to IDR 737.80 (USD 0.055). This is because the transaction costs of credit breeders contain contract cost components that arise from the livestock credit application process so that they cannot *get all* the benefits from the use of livestock resources such as the benefits of self-owned livestock breeder (private property). This is because the exclusivity characteristics of the property right structure can create an efficient allocation of resources where all the benefits and resource utilization are borne by the owner.

In addition, the increasing scale of business also lower the transaction costs as the larger the business scale leads to the lower average percentage of costs for transaction cost components. Based on the scale of the business both on credit breeders and independent breeders, generally indicate that the greater the scale of the business, costs of transactions issued by farmers will tend to be smaller. Large business scale has lower transaction cost than small and medium scale business. The component of transaction cost can be explained as follows:

Contract Fees

Members of dairy cooperative, generally, are small breeders where access to capital information is very difficult to obtain. The lack of access to this information causes the farmers seek information about the business capital to cooperatives or banks. This activity to obtain information incur costs. Generally, the capital of dairy cattle breeders derived from their own or independent capital and loan from banks or livestock credit. Credit transactions between livestock farmers and banks are facilitated by the cooperative. In this activity incur transaction costs in the form of contract costs. The components of contract costs are transportation costs to carry out identification, negotiation, fees for making file submission requirements of credits in contract agreement and insurance

costs of credit livestock. These costs are referred to as market transaction costs. According to Furubotn and Ritcher (2000), specifically, market transaction costs can be grouped into costs for preparing contracts, the cost for executing contracts or concluding contracts, and the costs of monitoring and enforcing the contractual obligations). The average contract costs incurred by credit breeders per day per unit of livestock is IDR 52.07 (USD 0.004).

Livestock and Members' Welfare Fund Costs

The cost of livestock welfare funds and members arises from cooperative management policies in the interest of the condition of the dairy cattle business and the condition of the farmer. Thus, the cost of livestock and members' welfare funds is the cost associated with creating order related to the enterprise management model or managerial transaction costs (Furubotn and Ritcher, 2000). The funds as a form of solidarity of the cooperative members in helping other members who experience unpleasant situation (sick or die). The amount of livestock welfare funds and members formed by mutual agreement of the members of the cooperative farmers, which amounted to IDR 1,000 (USD 0.074) per-month from the receipt of milk production deposited to the cooperative.

Cost of Maintenance of Livestock Resources

The cost of raising livestock resources is based on the costs incurred by farmers for the services provided by livestock health workers when dairy cattle are sick or have reproductive health problems, requiring treatment such as injecting antibiotics, providing vitamins and minerals, and doing artificial insemination. In handling the maintenance of livestock resources, there is a cost incurred to the veterinarian for the transfer of goods from the cooperative to the breeder so that the cost includes managerial transaction costs (Furubotn and Ritcher, 2000). The amount of the cost of raising livestock resources issued by farmers is not fixed, depending on the condition of the livestock, frequency of transactions, and voluntary, which is an incentive from breeders for veterinarian. Usually, the cost of maintenance is provided in cash and given directly to the veterinarian. The amount depends on the number of livestock handled ranging from Rp10,000 to Rp20,000 (USD 0.74 – 1.48) each service whose frequency is determined by the condition of the livestock.

Cost of Delivery of Milk and Feed Search

The cost of milk delivery is a market transaction cost, ie all costs incurred in order for goods to reach the market (Furubotn and Ritcher, 2000). The cost of delivery of milk sold to the cooperative is in the form of transportation costs that must be issued by the breeder from the dairy cattle into the milk collection point. Delivery of milk by breeder from cage to cooperative must go through milk collection point. Farmers have to pay transportation costs from the collection point to the cooperative. In addition, farmers have to spend costs to look for forages or production inputs for their livestock. The average cost of milk delivery and feed search per day per livestock unit of IDR 330.45 (USD 0.245).

The percentage of non-fixed transaction costs contributes enormously to the total transaction cost of 95.43% and the remainder is a fixed transaction cost. Percentage of livestock maintenance cost of 56.52% and milk feeding and feed search costs of 38.90% of the total transaction costs. This is because the size of the transaction costs for the maintenance of

livestock is determined by the condition of the dairy cows that are maintained, the incentive and frequency of livestock care services while the milk delivery and feed search is determined by the productivity and milk production, the frequency, and the cost incurred for sending milk and feed search or production input. The more the frequency of transactions, the greater the transaction costs borne by the breeder.

The average ratio of transaction costs to revenue is 0.0272 (2.72%) which means that in every breeder's revenue of IDR 10,000 (USD 0.74) incur a transaction cost of IDR 272 (USD 0.02). The ratio of transaction costs to the revenue of credit breeders is 0.0309 (3.09%) which means that in every credit breeder's revenue of IDR 10,000 incur transaction costs of IDR 309 (USD 0.23). While the ratio of transaction costs-revenue of independent breeders slightly lower than the credit breeders of 0.0235 (2.35%), which means that in each independent breeder' revenue of IDR 10,000 bear the transaction cost of IDR 235 (USD 0.017). This ratio shows that in dairy cattle business, credits livestock's breeder bear greater transaction costs than independent's breeder.

The distinguishing component is the existence of contract costs on the capital owned to be issued by the credit breeder. The average total cost per unit of livestock incurred by farmers per day is IDR 39,824.84 (USD 2.95) where for credit breeder is IDR 39,309.76 (USD 2.91) and independent breeder is IDR 40,339.91 (USD 2.99). When calculating the ratio of total transaction costs to total costs in the production activities, in average is 0.0213 which for the credit breeders 0.0245 and independent breeders 0.0183. This value indicates that the average proportion of transaction costs incurred by farmers in production activities is 2.13% of the total cost where for the credit breeder of 2.45% of the total cost and the independent breeders incur a transaction cost of 1.83 % of the total cost.

CONCLUSIONS

Contract farming are already under way in Indonesia, whether or not they will survive depending on a number of factors including physical, socioeconomic and policy factors. The result of the study revealed that the farmers are aware of the significance of the contract farming and the benefits obtained from participation in the program such as utilization of modern technology, guaranteed market, and further assistance in some aspects: technical service, training, provision on information and animal feed, animal health and environmental awareness etc. However, the study also suggested that the practice of contract farming raised the transaction cost in the dairy cattle business (resulting an increase in total cost). The smaller the transaction cost, the smaller the total cost. The greater the value of the transaction cost ratio to this total cost, indicating the more inefficient the production process of dairy cattle business. This inefficiency would affect the price determination of fresh milk at the farmer level so there is a link between transaction costs with milk prices and efforts to improve the welfare of farmers. An integrated approach in which dairy and feed industry, dairy cooperatives and farmers take part is needed to provide further assistance in some aspects. Cooperatives' leaders also need to build their extension workers' capacities to disseminate information, training to farmers and monitor their practices to attain high quality milk production. The productivity and efficiency of dairy farmers can be improved by introducing good farming practices through an improvement on farm management practices

including the provision of inputs, transportation, extension services, and, most importantly, market access. In addition, as feed represents 80% of the total production cost, special attention must be given to increase feed supply in terms of quality and quantity. Last but not least, support from both central and local government are very critical to keep the partnership model between farmers and the milk processing companies sustainable.

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