

Analysis of Beef Cattle Supply Chain in Miomaffo Barat District, North Central Timor Regency, East Nusa Tenggara

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Abstract

The purpose of this study was to determine product flow, financial flow, and information flow in the supply chain of beef cattle in West Miomaffo District. This research was conducted in West Miomaffo District in August 2020. This location was determined purposively (intentionally) based on the consideration that West Miomaffo District is one of the 10th (ten) largest beef cattle production centers or 4.04% of the total livestock population beef cattle and has a livestock traffic monitoring post facility with the duties and functions of monitoring the buying and selling activity of cattle crossing land from the TTU area. The type of data that is often used in this research is quantitative data in the form of numerical data, the value of which can change or be varied. In this study the method used was: survey data collection which was carried out by interviewing respondents using a questionnaire so that between researchers and respondents could communicate directly. Data analysis was carried out descriptively which refers to the supply chain of beef cattle. Based on the results of this study it was concluded that there were 40 livestock farmers consisting of 10 collectors, 2 inter-island traders, in West Miomaffo sub-district. The supply chain has a product flow of 2 channel networks, namely: Farmers, breeders, traders, collectors, inter-island traders. Farmers breeders-collectors-traders slaughter livestock. And there are 2 channel networks in the financial flow, namely: Livestock slaughter traders-collecting traders-breeding farmers. Inter-island traders-livestock traders-breeders. As well as the flow of information that moves from two directions from producers to consumers and consumers to producers.

Keywords : Beef Cattle Supply Chain Analysis.

Introduction

One of the main sub-sectors in the agricultural sector is the livestock sub-sector, which involves the management of livestock commodities. Beef cattle are a highly potential commodity in the livestock sub-sector. This can be seen from the high demand for beef that continues to increase. Beef cattle are livestock animals that can support the consumption needs of meat because they can be raised simply, easily, are popular among many people and their bodies are quite large compared to other livestock.

Supply chain is a concept in which there is a related management system for the flow of products, information, and financial flows (Indrajit and Djokopranoto, 2002). This management is important to be carried out in relation to the many links involved in the product supply chain. An approach to the supply chain system in the form of information flow functions to determine the portion of each marketing actor in the supply chain activities.

North Central Timor Regency (TTU) is one of the regencies that has a sea port used for loading and unloading of cattle by beef traders between islands to big traders in Jakarta and Kalimantan as the last consumer of live cattle. With this facility, it helps farmers in North Central Timor Regency (TTU), especially farmers in Miomaffo Barat District, who mostly raise beef cattle. Based on the above description, the author is interested in conducting research on "Analysis of Beef Cattle Supply Chain in Miomaffo Barat District".

Materials and Methods

This research was conducted in Miomaffo Barat District in August 2020. The location was purposively chosen based on the consideration that Miomaffo Barat is one of the top 10 areas with the highest production of beef cattle, accounting for 4.04% of the total population of beef cattle, and has a livestock traffic monitoring post tasked with monitoring the buying and selling activities of cattle across the TTU region. The research location includes the villages of Fatunisuan, Eban, Saenam, and Manusasi.

The research method used was descriptive quantitative, which aims to determine the condition of beef cattle farming and all the activities involved through a survey method (Singarimbun and Effendi, 2006). The information was obtained from respondents using a questionnaire as the primary data collection tool, and population sampling was used to describe, generalize, or predict opinions, behaviors, and characteristics within the population (Sugiyono, 2015).

The respondent selection method used two methods: purposive sampling and snowball sampling. Purposive sampling is sampling based on certain considerations, based on the research interest or purpose (Suharyadi, 2009). The respondents in this study were beef cattle farmers and livestock traders in Miomaffo Barat District, Timor Tengah Utara Regency. There were 40 cattle farmers and 12 livestock traders as respondents. Purposive sampling was used to select the cattle farmer respondents based on field data, while snowball sampling (Nurdiani, 2014) was used to select the livestock trader samples.

The data collected in this study consisted of primary and secondary data. Primary data were obtained directly from the source by conducting direct interviews with cattle farmers, livestock collectors, beef cattle wholesalers, and meat retailers. Secondary data were obtained from relevant agencies, such as the Central Statistics Agency, the Department of Livestock, research journals, literature, and library books related to this research.

Data analysis

This research is focused on understanding the supply chain of cattle in Miomaffo Barat District. The data analysis method used in this study is quantitative descriptive analysis. Quantitative descriptive analysis is a type of

research that produces findings that can be achieved through statistical procedures or other quantification methods (Sujarweni, 2014).

Results and Discussion

Based on the survey results, 40 livestock farmer respondents were obtained, spread across several farmer groups in the villages of Fatunisuan, Eban, and Manusasi. The characteristics of the livestock farmer respondents in Table 1 above can be explained as follows:

Table 1. Characteristics of Livestock Farmers

No	Characteristics	Number	Percentage (%)
1	Age		
	30-39	6	15,0
	40-49	19	47,5
2	50-59	15	37,5
	Education Level		
	SD	22	55,0
	SMP	12	30,0
3	SMA	5	12,5
	PT	1	2,5
	Family Dependents		
	2-3 people	9	22,5
4	4-5 people	18	45,0
	6-7 people	13	32,5
	Business Experience		
	≤10 years	10	25,0
	11-20 years	26	65,0
	> 20 years	4	10,0

Source: Primary data processed, (2021).

a) Age

The age characteristic in Table 1 shows that livestock farmer respondents aged 30-39 numbered 6 with a percentage of 15.00%. Those aged 40-49 numbered 19 with a percentage of 47.50%. Those aged 50-59 numbered 15 with a percentage of 37.50%. The age of farmers is a factor that affects their physical ability in managing beef cattle farming. This is in line with the research results of Suwarta (2012), that as farmers age, their livestock business productivity decreases. Furthermore, it is explained that in the process of adopting new innovations, productive age farmers will be more responsive compared to older (less productive) farmers.

b) Education Level

The characteristics of education level in Table 1 show that the number of livestock farmers with elementary school education is 22 with a percentage of 55.00%, while junior high school is 12 with a percentage of 30.00%, high school is 5 with a percentage of 12.50%, and one respondent had a university degree with a percentage of 2.50%. Education level is a determining factor for the success of a

livestock farmer. This is in line with the opinion of Misriani (2011), who stated that education level has a positive correlation with farmers' income.

c) Family Dependents

The characteristics of family dependents in Table 1 show that the number of livestock farmers with 2-3 dependents is 9 with a percentage of 22.50%, 4-5 dependents is 18 with a percentage of 45.00%, and 6-7 dependents is 13 with a percentage of 32.50%. According to Table 1, all livestock farmers have family dependents, and it affects their ability to run their livestock business. This is in line with the research by Zuman (2012), which found that the number of family dependents significantly affects the decision of farmers to maintain local cattle. The size of the family dependents influences the development of cattle farming business, so that the monthly income can be allocated to the cattle farming business.

d) Business Experience

The characteristics of business experience in Table 1 show that the number of livestock farmers with ≤ 10 years of experience is 10 with a percentage of 25.00%, 11-20 years is 26 with a percentage of 65.00%, and >20 years is 4 with a percentage of 10.00%. Table 1 shows that the respondents have been running their business for a long enough period..

Based on the survey results, there were 12 respondents consisting of 10 livestock collectors and 2 inter-island traders. The characteristics of the respondents can be explained as follows:

a) Age

The age characteristic in Table 2 shows that the respondents who are very productive, aged between 30-39 years, are 2 people (16.66%), followed by 5 people (41.67%) aged between 40-49 years, and 5 people (41.67%) aged between 50-59 years. This is in line with Alma's (2010) opinion that generally an entrepreneur is aged between 22-55 years old.

Table 2. Characteristics of Livestock Traders

No	Characteristics	Number	Percentage (%)
1	Age		
	30-39 years	2	16,67
	40-49 years	5	41,67
	50-59 years	5	41,67
2	Education Level		
	SD	1	8,33
	SMP	5	41,67
	SMA	4	33,33
	Sarjana	2	16,67
3	Family Dependents		
	2-3 people	3	25,00
	4-5 people	6	50,00
	6-7 people	3	25,00

Source: Primary data processed, (2021).

b) Education Level

Education level is one of the factors that determine success in marketing beef cattle, where the higher the education level of a trader, the more skills and knowledge they will have in marketing their livestock. This is in line with Riyanti's (2003) statement that education is one of the factors that support the success of small-scale businesses, assuming that the higher the level of education, the better the knowledge in managing the business.

c) Family burden

Based on Table 2, it can be seen that on average, livestock traders have a family burden of 4-5 people. The number of family burdens affects the income of livestock traders. This is in line with Solihin's (2015) opinion that the number of family members will motivate a head of household in their business.

Table 3 shows that the total input cost for cattle farming in the feedlot system (paron) is Rp 11,341,850. The biggest component of the cost is the purchase of young cattle with a financing amount of Rp 9,947,368 or equivalent to 87.70%, followed by the cost of feed which is Rp 708,092 or 6.24%, and the third largest financing component is labor cost at Rp 642,105 or equivalent to 5.66%, while the financing for medicine and vaccines is only Rp 26,858 per production cycle.

Table 3. Average Costs and Revenues of Beef Cattle Farmers (Paron)

No	Description	Value (Rp/head)	Percentage (%)
A.	Cost		
	Fixed Cost		
	a. Depreciation of barn	15.351	0,14
	b. Depreciation of equipment	2.075	0,02
	Variable Cost		
	a. Young cattle	9.947.368	87,70
	b. Feed	708.092	6,24
	c. Labor	642.105	5,66
	d. Medicine and vitamins	26.858	0,24
	Total cost	11.341.850	100.00
B.	Revenue	20.883.400	
C.	Income	9.541.550	

Source: Processed primary data, (2021).

The income analysis results show that the cattle farming business in the feedlot system (paron) conducted by farmers in Miomaffo Barat District generates revenue of Rp 20,883,400 per production cycle. Meanwhile, the income of each household of cattle farmers varies based on the number of cattle they own, as shown in Table 4.

Table 4 shows the average income of farmers based on the number of cattle owned

Number of ownership	Body Weight	Price/kg live weight (Rp)	Total revenue (Rp)	Total income (Rp)
4	283	32.575	25.029.450	9.192.367
3	291	32.325	19.958.700	8.019.421
2	294	33.271	19.571.029	11.480.660

The table above explains that cattle farmers of the beef cattle category based on the number of livestock ownership have an average of 4 heads, an average weight of 283 kg, and an average price per kg of live weight of 32,575. This results in an average income of Rp 9,192,367. For the category of beef cattle ownership with an average of 3 heads, the average weight of cattle ranges from 291 kg, with an average price per kg of live weight of Rp 32,325, resulting in an average income of Rp 8,019,421 for farmers. Meanwhile, for the category of beef cattle ownership with an average of 2 heads, the average weight of the cattle is 294 kg, with a price per kg of live weight of Rp 33,271, resulting in an average income of Rp 11,480,660. This indicates that the more cattle in the feedlot, the higher the operating costs, especially for feed, which has an impact on the increasing daily weight gain of the cattle. For details of the financing components, revenue, and income of beef cattle farmers (breeding), as seen in Table 5.

Table 5 shows the average costs and revenues of beef cattle farmers (breeding).

No	Description	Value (Rp/cattle)	Percentage (%)
A.	Cost		
	Fixed Costs		
	a. Depreciation of cages	4.861	0,05
	b. Depreciation of equipment	1.221	0,01
	Variable Costs		
	a. Young cattle	8.833.333	96,01
	b. Feed	190.583	2,07
	c. Labor	150.000	1,63
	d. Medicine and vitamins	19.970	0,22
	Total costs	9.199.969	100,00
B.	Revenues		
	a. Slaughtered cows	6.904.762	52,63
	b. Male calves	2.785.714	21,23
	c. Female calves	3.428.571	26,13
	Total revenue	13.119.048	100,00
C.	Income	3.919.079	

Table 5 shows that the average cost components in raising beef cattle in the breeding system are dominated by the cost of purchasing young cattle, which

accounts for Rp 8,833,333 or equivalent to 96.01% of the total cost. The second largest cost component is the cost of feed, which is Rp 190,583 or 2.07%, followed by the cost of labor, which is Rp 150,000 or equivalent to 1.63%, while the cost of medicine and vaccines is only Rp 19,970 per production cycle. The average income of beef cattle breeders in the breeding system is Rp 13,119,048, while the income of breeders can be differentiated based on the number of cattle ownership as explained in Table 6.

Table 6. Average income of cattle farmers based on the number of cattle ownership (breeding)

Number of Ownershi p	Weight of Livestock (kg)	Culled Livestock	Young Livestock		Total Revenue (Rp)	Total Income (Rp)
			Jantan	Betina		
4	207	6.625.000	5.625.000	7.000.000	19.250.000	4.726.761
3	207	7.458.333	3.750.000	4.000.000	15.208.333	4.394.410
2	208	6.625.000	2.687.500	2.500.000	10.812.500	3.642.820

The table above explains that the income of beef cattle farmers (breeding) for the category of 4 head ownership generally weighs an average of 207 kg, which are mostly culled cows, with an average price of Rp 6,625,000. Meanwhile, for young male cattle, the average price range is Rp 5,625,000 and for young female cattle, the average price range is Rp 7,000,000. The average income of beef cattle farmers for 4 head ownership is Rp 19,250,000 with an average revenue of Rp 4,726,761.

For the category of 3 head ownership, the average weight of cattle is 207 kg, mostly culled cows with an average price of Rp 7,458,333. The average price per head for young males is Rp 3,750,000, while for young females it is Rp 4,000,000. The total average revenue is Rp 15,208,333 with an average income value of Rp 4,394,410.

For the category of 2 head ownership, the average weight of cattle is 208 kg, mostly culled cows with an average price of Rp 6,625,000. The average price per head for young males is Rp 2,687,500 and for young females, it is Rp 2,500,000. The total average revenue is Rp 10,812,500 with an average income value of Rp 3,642,820.

Most of the marketing of beef cattle in Miomaffo Barat District is not based on production planning, but rather due to urgent cash needs, resulting in the weight of the cattle sold not matching the market demand. The cattle marketing system is still traditional, determining the weight estimate of the cattle and the price is determined by the collector/buyer. The bargaining position of farmers is very weak when dealing with collectors.

From Tables 4 and 6, it can be seen that the price of male cattle per kilogram of live weight for each maintenance pattern is better than the price of

female cattle. This is due, among other things, to the demand for male cattle to meet inter-island market demand and the relatively better daily weight gain compared to female cattle (Basuki, 2004).

Filly (2018) explains that business profits are influenced by the level of farmer income. Income is an important benchmark for assessing farmer welfare, as the level of farmer welfare depends on the level of farmer income.

Table 7. Average costs, revenues, and incomes of inter-island traders

No	Description	Value (Rp/merchant)	Percentage (%)
A. Cost			
1	Purchase price of livestock	65.109.783	98,42
2	Transportation (pickup rental)	316.667	0,48
3	Feed and drinking water cost	143.000	0,22
4	Retribution	73.333	0,11
5	Animal Health Certificate	146.667	0,22
6	Cellular phone credit	125.833	0,19
7	Livestock loading and unloading cost	132.500	0,20
8	Rope	110.000	0,17
	Total cost	66.157.783	100,00
B. Income		71.364.067	
C. Revenue		5.206.283	

Source: Primary data processed, (2021).

The cost analysis results in Table 7 above show that the business of buying and selling of cattle for inter-island livestock transportation in the Miomaffo Barat District by livestock collectors incur costs of Rp 66,157,783 with the largest proportion of expenses being spent on purchasing livestock, which amounts to Rp 65,109,783 or 98.42% of the total cost. Only Rp 1,048,000 or 1.58% of the total cost is used for transportation, animal health certificate, feed and drinking water cost, livestock loading and unloading cost, cellular phone credit, rope, and livestock retribution. The sales of livestock resulted in a revenue of Rp 71,364,067, and the income per merchant can be differentiated based on the number of livestock ownership, as shown in Table 8.

Table 8. Average income of livestock collectors for inter-island transportation based on the number of livestock ownership.

Number of Livestock Ownership	Average Weight (kg)	Price/kg BBH (Rp)	Total Income (Rp)	Income (Rp)
9	276	32.100	88.272.000	6.570.500
7	281	32.100	69.115.200	5.075.350
6	270	32.000	56.700.000	3.973.000

As can be seen from the table above, it explains that the income of livestock collectors categorized by the number of livestock ownership is on average 9 heads with an average body weight of 276 kg, the average price per kg

of live weight of cattle is Rp 32,100, the total income on average is Rp 88,272,000 and the average income is Rp 6,570,500.

The category of livestock ownership with an average of 7 heads, with an average body weight of 281 kg, the average price per kg of live weight is Rp 32,100 with an average income of Rp 69,115,200 and an average income of Rp 5,075,350. The category of livestock ownership with an average of 6 heads with an average body weight of 270 kg has an average price per kg of live weight of Rp 32,100, an average income of Rp 56,700,000 and an average income of Rp 3,973,000.

Table 9. Average cost, revenue, and income of livestock collectors for the purpose of cutting at the slaughterhouse (RPH)

No	Description	Value (Rp/trader)	Percentage (%)
A.	Cost		
1	Livestock purchase price	8.812.500	97,60
2	Transportation (pick-up rental)	300.000	0,75
3	Feed and drinking water cost	114.250	0,29
4	Retribution	60.000	0,15
5	Animal Health Certificate fee	120.000	0,30
6	Mobile phone credit	121.250	0,30
7	Livestock loading and unloading cost	150.000	0,38
8	Rope	90.000	0,23
	Total cost	9.768.000	100,00
B.	Revenue	2.262.500	
C.	Income	2.494.500	

Source: Processed primary data, (2021).

In Table 9 above, it can be seen that the business of buying and selling cattle conducted by cattle collectors for the purpose of slaughtering in the Kefamenanu city RPH incurs a cost of Rp 9,768,000, with the largest proportion of the cost spent on purchasing cattle amounting to Rp 8,812,500 (97.60%) of the total cost, while only Rp 955,500 (2.40%) of the total cost is used for transportation, animal health certificate fees, retribution fees, cattle feed costs, cattle loading and unloading costs, mobile phone credit costs, and rope costs. Meanwhile, the income per trader can be differentiated based on the number of cattle ownership as shown in Table 10.

Table 10 shows the average income of RPH collector traders.

Number of Ownership	Average Weight (kg)	Total Revenues (Rp)	Total Income (Rp)
7	188	45.900.000	2.787.000
5	201	38.625.000	2.202.000

As seen from the table above, it explains that the income of livestock collectors for the purpose of slaughter in the RPH depends on the number of cattle owned. The average number of cattle owned is 7, with an average weight of 188

kg. The average income received is Rp 45,900,000 with an average income of Rp 2,787,000. For the category of 5 cattle ownership, the average weight is 201 kg. The average income received is Rp 38,625,000 with an average income of Rp 2,202,000.

Inter-island traders are entrepreneurs who sell live slaughter cattle to destinations outside of NTT Island such as DKI Jakarta (West Java) and Samarinda (East Kalimantan). Inter-island traders have a holding ground located in Wini, where the cattle are quarantined before being sold off the island.

Table 11. Average costs, revenues, and incomes of inter-island cattle traders.

No	Description	Value (Rp/farmer)	Percentage (%)
A.	Cost		
1	Purchase price of cattle	1.757.650.000	91,92
2	Local transportation	8.333.333	0,44
3	Local PTKT fee	3.333.333	0,17
4	CN4 ship tickets	25.700.000	6,57
5	Quarantine feed	4.000.000	0,21
6	Food during the trip	3.750.000	0,20
7	Labor costs	5.000.000	0,26
8	Mobile phone credit	205.000	0,01
9	Quarantine service fees	4.116.667	0,22
	Total costs	1.912.088.333	100,00
B.	Revenues	2.097.675.000	
C.	Incomes	185.586.667	

Source: Primary data processed, (2021).

The above Table 11 shows that the trade of live cattle between inter-island traders in Kematan Miomaffo Barat in fulfilling the demand of large cattle receivers in Samarinda and DKI Jakarta during the period of August-September 2020 sent 500 heads of cattle (300 heads to Samarinda and 200 heads to DKI Jakarta) with a total cost of Rp 1,912,088,333. The largest proportion of costs incurred is for purchasing cattle, which amounted to Rp 1,757,650,000 (91.92%), followed by transportation costs (sea transport Rp 25,700,000 and local transport Rp 8,333,333) 7.06%. This indicates that transportation costs dominate other cost components, followed by feed costs (consisting of feed during the quarantine process and feed during the journey) of Rp 7,750,000 (0.41%), labor costs of Rp 5,000,000 (0.26%), quarantine service costs of Rp 4,116,667 (0.22%), PTKT costs of Rp 3,333,333 (0.17%), and cellphone credit costs of Rp 205,000 (0.01%) of the total production cost. Meanwhile, the average income can be distinguished based on the number of cattle ownership as shown in Table 12.

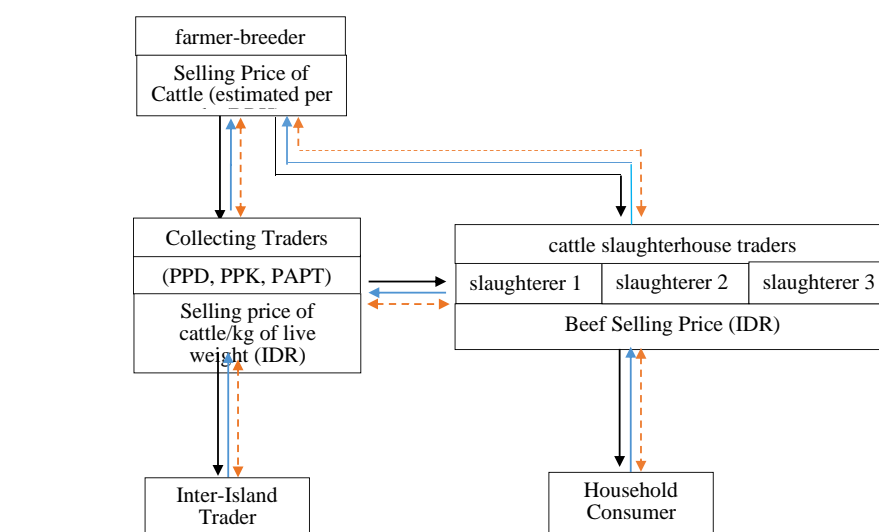
Table 12. Average income of inter-island traders.

Number of Livestock Ownership	Average Weight (kg)	Price/kg BBH (Rp)	Total revenue (Rp)	Total Income (Rp)
200	307	35.100	2.578.800.000	238.375.000
150	297	35.050	1.857.112.500	159.192.500

The table above illustrates the average income of inter-island livestock traders categorized by the number of cattle ownership. For those with an average ownership of 200 cattle, the average weight is 307 kg with an average price of Rp 35,100 per kg of body weight. The average amount received is Rp 2,578,800,000 and the average income is Rp 238,375,000. Meanwhile, for those with an average ownership of 150 cattle, the average weight is 297 kg with an average price of Rp 35,050 per kg of body weight. The average amount received is Rp 1,857,112,000 and the average income is Rp 159,192,500.

Inter-island traders buy cattle by weighing them, unlike collector traders who estimate the weight. This causes a significant price difference from farmers to inter-island traders.

The supply chain network structure of the beef cattle in Miomaffo Barat district generally has several common characteristics. The flow pattern in the distribution network of the beef cattle supply chain shows that there are three flows in the pattern, namely the product flow, the financial flow, and the information flow.



Description:
 Product flow: —————→
 Financial flow: ←—————
 Information flow: - - - - ->
 PPD: Village Collector Trader
 PPK: District Collector Trader.
 PAPT: Inter-Island Livestock Trader

Product flow

The product flow is the flow of beef commodity that flows from upstream to downstream in the form of cattle and beef to meet customer satisfaction. Inter-island livestock traders receive livestock supplies from both village and district collector traders. Based on the results of field studies, it is known that male beef cattle are generally castrated and then traded as inter-island beef cattle. The percentage of beef cattle sales through collector traders is highest at 62.2%, and farmers sell their livestock directly to inter-island traders at 26.7%. This research is almost in line with the study by Noach and Lalus (2020), where 72% of farmers sell their livestock through intermediary traders. Generally, the sale of cattle is done at the farmer's location (Hadi, 2012), meaning that the buyer (trader) visits the farmer's pen, observes the livestock, estimates the weight of the livestock, and then negotiates the price. If the price is agreed upon, a transaction occurs, which is paid in cash and the livestock is then brought/cashed out. Generally, the cattle marketing system that occurs in West Miomaffo District is not much different from that in TTU, and farmers have a position as price takers, not price makers. This is because farmers do not have a bargaining position as it is triggered by the habit of farmers selling their livestock not based on production planning but more on selling livestock to meet household needs for relatively large amounts of money (urgency finance), such as school fees, building a house, and events (Saptana and Ilham, 2017; Sikone et al., 2022). This is what makes farmers tend to suffer losses in marketing beef cattle.

Financial flow

Based on research results, it is known that there are two financial networks in the flow of finance (Figure 2), namely: inter-island livestock traders, which begin with farmers, collector traders, inter-island livestock traders, and large traders outside the island. The flow of finance is a movement of money that occurs from downstream to upstream, which in the context of this research flows from end consumers and/or from household consumers to farmers. The flow of finance in each marketing institution is important, with the aim of not impeding the movement of transaction flows. The structure of the financial flow that occurs in the field can be explained as follows:

a) The financial flow of livestock sales between islands

The structure of the financial flow pattern of live cattle sales in the livestock distribution channel to inter-island destinations begins with farmers selling their livestock and receiving money flow from collectors or inter-island traders. Payment is made in cash based on agreements and suitability of livestock weight with negotiated prices referring to the livestock price map held by traders, where livestock weighing 250 kg is priced at Rp 32,000/head and each 25 kg increase in weight is followed by a price increase of Rp 200. Payment is made directly at the farmer's house or at the place where the agreement/transaction takes place. At this stage, the financial flow goes from the collector/inter-island trader to the farmer, and then the livestock is transported to the holding ground (HG) of the trader with land transportation (pick-up) with an average transportation cost of Rp 50,000/head.

The next flow of financial transactions occurs from inter-island traders to cattle collectors, where the payment transaction is made in cash after the livestock is weighed to determine its weight. The offered price for live cattle by inter-island traders is Rp 34,000/BHH for cattle with a weight of 250 kg, and every increase of 25 kg in weight will be followed by an increase in price of Rp 250. The payment system is made in cash at the holding ground location and/or at the inter-island trader's house. The next flow of financial transactions goes from outer island traders to inter-island traders. Livestock that will be shipped by sea transportation (CN4) must first go through a mechanism/series of inspections at the animal quarantine office for 4 days (based on standard procedures). Financial flow also goes to the government for the cost of quarantine action/services at a rate of Rp 21,100 per head. The next flow of financial transactions goes from outer island traders to inter-island traders after the livestock arrives at the destination port with a free on board (FOB) pattern. The price offered by inter-island traders for cattle with a weight of 275 kg is Rp 41,100/BHH. The payment system is made by bank transfer. Finally, the end consumers channel their money to outer island traders through the purchase and provision process of fresh beef produced. This mechanism occurs continuously and simultaneously.

b) The financial flow of livestock sales to the Slaughterhouse (RPH).

The flow pattern in the distribution channel of cattle to the RPH starts with the farmer who sells their cattle and receives a cash flow from the collector or slaughterer. Payment is made in cash based on the agreement and product suitability (condition of the cattle) with the price requested by the farmer. Payment is made directly at the farmer's house or wherever the sale transaction agreement takes place. At this stage, the financial flow moves from the collector/slaughterer to the farmer. The cattle are then transported to the RPH at a cost of Rp 50,000/head.

The next financial flow is from the meat retailer to the slaughterer that occurs at the slaughterhouse. Financial flow also goes to the government in relation to the retribution fee for cutting in the RPH. The financial flow that occurs in the RPH is not related to the product because the RPH institution only plays a role in service and supervision of slaughter and to ensure that the slaughtered cattle are in a sufficiently rested, healthy and suitable condition for cutting. There is a financial flow in the form of RPH retribution service fees of Rp 35,000 per head with details of payment: ante-mortem/post-mortem inspection services (Rp 15,000), cage usage fee (Rp 1,500), place usage fee for cutting (Rp 7,000), place usage fee for offal separation (Rp 2,000), place usage fee for meat laying (Rp 1,500), place usage fee for meat service (Rp 2,000), waste storage place usage fee (Rp 1,000), and meat stamping service fee (Rp 5,000). Furthermore, the retailer flows money to the slaughterer through the purchase and fresh beef provision process.

Information flow

Information flow is a two-way flow that moves from producers to consumers and from consumers to producers. This is in line with Emhar et al.'s (2014) research, which found that information flows both vertically and horizontally. An information system in the supply chain is crucial because it can

build cooperation through the creation of a network. Ideally, the information flow should be two-way, from upstream to downstream and vice versa. However, the field fact shows that there is still negative information transmission or information deviation practices about the standard price map at the level of inter-island traders regarding the price of live cattle in DKI Jakarta/Samarinda. There is a two-way flow of information that occurs vertically and horizontally (Syakur et al., 2017; Sikone et al., 2022). Vertical flow is a form of coordination flow in different chains, between farmers, collectors, inter-island traders, external traders, slaughterhouses, retailers, and consumers. Horizontal coordination occurs between chain members. The form of horizontal coordination is coordination among cattle traders regarding the supply of cattle at the farmer level.

Conclusion

Based on the results of this study, it is concluded that there are 40 livestock farmers consisting of 10 collectors and 2 inter-island traders in the Miomaffo Barat district. There are 2 product flow networks in the supply chain: Livestock farmers-collectors-inter-island traders, and livestock farmers-collectors-slaughterhouse traders. There are also 2 financial flow networks: Slaughterhouse traders-collectors-livestock farmers and inter-island traders-livestock traders-livestock farmers. Furthermore, there is a two-way flow of information from producers to consumers and vice versa.

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