The study of local beef market structure in Jakarta, Indonesia

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Abstract. This study was implemented to determine benefit distribution from the value chain and analyze Jakarta's local beef market's price determination processes. The research method was a survey, and a purposive sampling technique was used to select key informants. A structured questionnaire was designed to collect the data supplemented with focus group discussion. Data were analyzed using descriptive quantitative statistics. The descriptive statistics revealed a market structure based on the elements to have many consumers and suppliers with ex-imported cattle (98 percent) and local cattle from East Nusa Tenggara and East Java (2 percent) fulfilled the demand in a year. Middlemen in the supply chain have more significant benefits than producers (feedlots and farmers) and consumers. The implication of the study is developing a business model for modern retail or butchering-based meat shops that increases the added value of local meat and benchmarking of a long beef chain efficiency at post-cutting (downstream). The development of a modern retail business model is expected to drive the shifting system sales of beef from a commodity to a product basis.

1. Introduction
As an urban area and a consumer base, Jakarta is in critical need of food [1]. The increased demand for food during the day is due to the increasing population density and number of people entering Jakarta from the surrounding areas. However, the limited land for producing food causes Jakarta to heavily reliant on other areas that produce food.

Considering the high demand for certain agricultural products in Jakarta, food inflation is affected by the weight of inflation in specific food commodities. Beef is one of several food commodities that has a significant impact on inflation. Beef demand in Jakarta is approximately 329.25 tons per day (9,877.5 tons per month) [2].

Therefore, efforts to meet the beef demand in Jakarta are to conduct trade transactions with several suppliers, which generally come from surrounding areas, production centers, and import mechanisms. As the result, a national beef production deficit reaches 281,680 tons in a year [3]. However, the majority of beef suppliers in Jakarta are middlemen and importers. Furthermore, the size of each market player's market share has not been transparently known.

Identification of beef sources is needed to map food sources for Jakarta demand and surrounding areas. Based on several mapping reviews and the phenomena mentioned above, it is reasonably relevant if an analysis of the beef market structure is carried out, especially local beef. The initial concentration of this study is the moment the level of public consumption of beef is very high.

The structure of the local beef market needs to be investigated further to see how the beef trade system, particularly for local beef, factors determine the structure of local beef prices and the policies. Hence, this study was implemented to determine benefit distribution from the value chain and analyze Jakarta's local beef market's price determination processes.
2. Method
The research method was a survey, and a purposive sampling technique was used to select key informants. A structured questionnaire was designed to collect the data supplemented with focus group discussion. Data were analyzed using descriptive quantitative statistics.

| Table 1. Stakeholder mapping on data and information collection. |
|---------------------------------------------------------------|
| **Informant**                                                                 | **Focus survey**                                                                 | **Output information**                                                                 |
| Head of Association of Beef Cattle Business/ Gabungan Pelaku Usaha Peternakan Sapi Potong Indonesia (GAPUSPINDO) | Distribution of location and production capacity of feedlots in West Java, Banten, and Lampung | Data on the location and production capacity of a feedlot that supplies local beef from imported cattle to Jakarta |
| Representative of Meat and Livestock Australia (MLA) | Information on the number of imported cattle from Australia that enter the Jakarta slaughterhouse or its surroundings | The slaughterhouses in Jakarta and its surroundings are used to supply meat to Jakarta |
| Head of Animal Protein Entrepreneurs Association/ Asosiasi Penguasa Protein Hewan Indonesia (APPHI) | Market share segmentation from local meat | Data on Australian imported cattle that supplied the Jakarta slaughterhouses |
| Head of Meat Traders Association/ Asosiasi Pedagang Daging Indonesia (APDI) | The flow of local fresh meat purchasing by meat traders from trading chain actors | Data on the percentage of fresh meat distribution to the trade chain (modern retail, industrial processing, HORECA, and the SMEs (meatball, food stall, restaurant) |
| Head of Meat Distributor Association/ Asosiasi Distributor Daging Indonesia (ADDI) | Distribution and quantity of local meat entering Jakarta) | The volume of local meat that enters and is distributed in Jakarta |
| Head of Cattle and Buffalo Farmers Association/ Perhimpunan Peternak Sapi dan Kerbau Indonesia (PPSKI) | Data on local cattle slaughter in Jakarta and surrounding slaughterhouses | Source of supply Distribution area |
| Representative of Slaughterhouse/ Rumah Potong Hewan (RPH) | Live cattle price and carcass percentage | Source of supply Distribution area |
|                                                                                  | Source of supply and distribution area. | Source of supply Distribution area |

3. Result and discussion

3.1. Local beef market structure
The structure of beef traders indicates that the competition that may occur is competition at the price level and the quality of the goods offered. Based on the findings of a survey of 38 meat traders conducted in seven market locations, there are four types of meat traders: meat traders who only sell local beef, local beef with imported beef, local beef with imported buffalo, and traders of local beef, imported beef, and imported buffalo. The following diagram is the meat trader's structure based on the survey results in the Jakarta market and surroundings.

![Figure 1. Structure of meat traders in Jakarta and surroundings.](source: Primary data)
From Figure 1, we can conclude that: (1) Every meat trader sells fresh local meat; then (2) no meat seller only sells imported buffalo meat; and (3) there are no meat traders who only sell imported beef. Therefore, it is expected that meat sellers with fresh local meat and buffalo meat are the most profitable. It can be seen that the dominance of traders selling fresh local meat and imported buffalo is 76.32 percent.

These conditions indicate that the price factor allows consumers to shift their preferences from beef to buffalo meat. The change in the structure of the meat traders has changed significantly in proportion to the survey conducted by [4], where traders selling a combination of beef and buffalo were still at 8.5 percent, and traders selling beef were still dominant at 90.5 percent, whereas traders who sell buffalo meat only 1 percent.

The local beef supply in Jakarta and its surroundings comes from ex-imported/feedlot cattle (98 percent), and 2 percent comes from local cattle. 44.38 percent of ex-imported cattle slaughter comes from Lampung, and the remaining 55.62 percent comes from West Java. 20.84 percent of the cattle slaughtered directly in Jakarta's slaughterhouses area are scattered in the Tangerang, South Tangerang, Bogor, and Bekasi [5]. Furthermore, most of the buffalo meat was imported from India [6].

### 3.2. Cattle and beef value chain analysis

Value chain analysis identifies the main activities of the process chain that add value to the product. There were three main processes in the local meat production process, specifically (1) the on-farm production process of live feeder cattle fattened into ready-to-slaughter cattle; (2) the process of slaughtering cattle in the slaughterhouse, which changes the product from live cattle to carcass; (3) the butchering process which converts carcass meat into primary, secondary, manufacturing meat, variety meat, edible meat items [7, 8].

**Figure 2.** Value chain of cattle into the meat.

Source: Primary data

The highest benefit distribution of the beef supply chain is obtained by traders (middlemen), not the producers. Butchers sell furthermore of the meat to the retailer in traditional markets, inter-city or regency meat traders, and some are sold to modern markets, hotels, restaurants, and caterers (HORECA). Then, the meat is sold to end consumers and small-scale processing industries (meatball makers, food stalls, and caterers).

Based on data [4], the most significant beef consumption is in the small and medium enterprises (SMEs), amounting to 32.2 percent for the needs of meatball, satay, restaurant (warteg) burgers, sausages, and other preparations. The HORECA has a proportion of 26.7 percent. This meat is a prime cut for steak or barbeque and other dishes. The processing industry does have a 21.3 percent demand
for beef-based processed products such as meatballs, sausages, nuggets, and other items. Secondary cut and CL products are the most common types of meat used. Manufacturing meat, namely by-product 55-95 CL, diced meat, and ground meat.

CL is an abbreviation of chemical lean. The meat is processed and not pure beef, which contains fat in the meat. As an instance, 85CL means that the fat content is 15 percent, the pure meat is only 85 percent. Subsequently, modern retail needs such as butcher shops and supermarkets, in general, use prime cut meat consisting of internal hash, outer hash, and lamusir with a segment for household needs.

### 3.3. Local beef market's price determination processes analysis

In principle, the determining beef price is inseparable from the primary value of the purchase of beef, which is charged to the carcass value and the portion that can be sold or consumed. The illustration for price determination of beef is water in a teapot filled into a related vessel. The following figure illustrates determining local meat prices from the primary value of purchasing one cattle.

![Diagram illustrating the base value of meat from local cattle.](image)

**Figure 3.** Illustration formation of the base value of meat from local cattle.

Based on Figure 3, each part of the carcass meat has a various proportion based on the scale results. The balancing process results that the primary value of each item of meat will be broken down according to the needs and demands of each item. The beef's primary value or carcass is merely distributed to each part of the meat based on the proportion of volume produced. Yield or the ratio of meat and bones is also a factor in the formation of prices.

Furthermore, adjusting the primary value of each part through the market price approach as the applicable reference for each item. So that initially, the proportion of the price per kilo of each equal share becomes more proportional based on the prevailing price approach. Based on the existing market price approach, the primary value of each part will also change and subsidize each other, and the total value of the product from each item can cover the primary value of the purchase of one cattle or the load value of the existing meat carcass.

The market value of offal and meat variety products is far below the base value and price. Then this value will be adjusted and transferred to the higher market value of meat products such as prime-cut products or part of secondary cut products. The number of product items from the breaking and their formation mechanism applies the same as these principles.

The pricing mechanism is determined by how the meat parting item is sold. Each region has the characteristics of standard meat parting, which is usually inseparable from the existing regional cuisine culture and how to cook it. Parting items that do not sell in Jakarta, such as fat, offal, head meat, or legs, may be of no value, but in other areas, these parts may be of more value because of the characteristic cuisines growing dishes cause demand for these items. The following is a simulation result of forming a local meat base price by dividing it into seven main product items.
Table 2. Simulation formation of the base price for the splitting of beef from local cattle.

| Type of Parting    | % of live weight | Weight (kg) | Based Price (IDR/kg) | Value (IDR /head) |
|-------------------|------------------|-------------|----------------------|-------------------|
| Prime cut (Loin)  | 3.30             | 76.6        | 106,046              | 1,862,883         |
| Hind-quarter      | 12.16            | 64.7        | 104,294              | 6,742,583         |
| Fore-quarter       | 15.89            | 84.5        | 91,938               | 7,765,667         |
| Bone in            | 5.91             | 31.4        | 59,996               | 1,883,883         |
| Offal              | 10.01            | 53.2        | 22,707               | 2,159,800         |
| Variety meat       | 22.23            | 118.2       | 28,364               | 3,352,600         |
| Bone               | 5.14             | 27.3        | 6,195                | 169,333           |
| TOTAL              | 74.64            | 396.9       | 57,920               | 22,985,700        |

Source: Primary data

In the existing supply chain, especially Eid al-Fitr, there was an increase in consumer demand at the start of Ramadan [9], the usual price of 140 thousand rupiahs (IDR) per kilo before Ramadan and it can be up to 180 thousand rupiahs. It happened because there were no specifications for prime cut, secondary cut on local cattle, and buffalo beef [10]. Hence, the beef floor price has been set at a flat 140 thousand, so consumers already know that they are not making bargains.

The market trend position in the 153 markets showed that people in Jakarta buy meat without fat. Nonetheless, in the Surabaya and Semarang, fat cannot be separated from meat wants to clean it, so fat will enter the meat scale.

4. Conclusion
The descriptive statistics revealed a market structure based on the elements to have many consumers and suppliers with ex-imported cattle (98%) and local cattle from East Nusa Tenggara and East Java (2 percent) fulfilled the demand in a year. The supply chain of the local beef trade system has not changed and still shows that there has been no change in the last three years. Middlemen in the supply chain have more significant benefits than producers (feedlots and farmers) and consumers. The implication of the study is developing a business model for modern retail or butchering-based meat shops that increases the added value of local meat and benchmarking of a long beef chain efficiency at post-cutting (downstream). The development of a modern retail business model is expected to drive the shifting system sales of beef from a commodity to a product basis.

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