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Research article

Socio-economic impact of the Covid-19 pandemic: Empirical study on the supply of chicken meat in Indonesia

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Abstract: The Covid-19 pandemic that occurred in Indonesia had a major impact on all sectors of life, especially health and the economy, including the supply chain of chicken meat. This study aims to examine the socio-economic impacts caused by the Covid-19 pandemic on the chicken supply chain in Indonesia. This study was conducted using a qualitative approach. The data used are statistical data obtained from the Central Bureau of Statistics in the form of secondary data from March 2019–July 2020 and supported by literature studies. Data analysis techniques use descriptive statistics. The results of the study found that the spread of Covid-19 had a major economic and social impact on the sustainability of businesses in the livestock sector especially attacking the logistics system as a means of providing food for the community. As a result, price disparities among the regions are large, price movements are extreme and pattern less (uncertainty), consumption and production decline sharply, imported products are blocked, and labor has decreased drastically. The supply chain system is

disrupted due to obstruction by the distribution system so that production accumulates at the producer level; prices decrease while demand also decreases due to decreasing purchasing power, however, in areas with stable demand, high prices and lower purchasing power as a result of the layoffs of many workers. The average share received by breeders of broiler chicken meat in 2018 and 2019 ranged between 46.64% and 47.89%. However, during the Covid-19 period between June-July 2020 the breeders share was around 49.59%. The economic impact due to the Covid-19 pandemic was in the form of over supply which led to a decrease in the price of chicken on the market. In addition to having a massive economic impact, the social impact of the spread of the Covid-19 virus on chicken farming has implications, especially for conventional breeders/farmers. This Covid-19 pandemic can be momentum for conventional breeders/farmers to make changes to more modern marketing strategies, but still comply with government policies to carry out social and physical distancing.

Keywords: socio-economic; Covid-19 Pandemic; supply chain; breeders

1. Introduction

The current Covid-19 outbreak is considered internationally a global health emergency as it is concerned that it will increase the number of human deaths in the world [1]. The report, Despite rigorous global containment and quarantine efforts, the incidence of COVID-19 continues to rise, with 90870 laboratory-confrmed cases and over 3000 deaths worldwide [2]. The World Health Organization (WHO) declared the COVID-19 outbreak as a global emergency on January 30th, 2020 [3]. The prohibition on physical gathering and contact is imposed in all sectors of activity including economic activity. In a country which is the country with the largest economy in the world, it triggers fears of an economic crisis and an impending recession [4–5]. According to the IMF, this will significantly reduce world economic activity [6–7]. This requires early handling of entrepreneurs/managers in general, especially broiler chicken suppliers in Indonesia, to implement management functions in the supply chain optimally. According to the research results of [8] that in order to maintain food safety and food sustainability, the entire food supply chain uses models ranging from planning, monitoring, controlling, and optimizing the supply chain by using the right time by online. [9] Argued from the results of their research that maintaining supply chain resilience in an era of extreme dynamism and vulnerability is very important, companies that frequently experience supply chain disruptions are more likely to survive in difficult or unstable times. Some research related to supply chains facing an extreme era in maintaining survival due to COVID-19, namely [10] in their research Viability of intertwined supply networks: extending the supply chain resilience angles towards survivability. A position paper motivated by the COVID-19 outbreak, [11] for research related to the Impact of COVID-19 on logistics systems and disruptions in the food supply chain, [12] regarding Corona virus, tariffs, trade wars and supply chain evolutionary design, [13] Covid-19's Impact on Supply Chain Decisions: Strategic Insights for NASDAQ 100 Firms using Twitter Data, [14], research related of Food supply chains during the COVID-19 pandemic, [15] related research Lessons learned from the COVID-19 pandemic exposing the shortcomings of current supply chain operations: a long-term prescriptive offering, [16] in research on the Impacts of COVID-19 on Global Supply Chains: Facts and Perspectives, [17] research on The impact of COVID-19 on the UK fresh food supply chain, [18], about Agile planning: Avoiding disaster in the grocery supply chain during COVID-19 crisis.

In Indonesia, this pandemic is experiencing a significant increase every day so that the Indonesian government implements the Large-Scale Social Restriction/PSBB (*Pembatasan Sosial Berskala Besar*) policy. However, this policy threatens Indonesian economy, and also the economies of other countries [19], due to the declining of company performances. These critical issues are evident in the companies involved in the production and distribution of foodstuffs, especially chicken meat [20]. However, it is important to highlight that the spread of COVID-19 pandemic not only affected the chicken meat production chain, but also other production chains, like the cereals and bakery product production chains, in Indonesia and in all over the world. COVID-19 influences the production chains at all levels, i.e. agriculture [21], cereals milling and raw materials processing [22–23], food production [24–26], and food distribution [20]. This condition is further aggravated by the WFH (Work from Home) policy. These impacts particularly influence the chicken meat production chain and make the price of chicken meat in the market increasingly falling. Even though the price of chicken meat in the market has dropped dramatically, it is still difficult for breeders/farmers to market it. This is different from the economic theory that if prices decrease, consumer demand will increase [27]. Therefore, especially in the field of farming/livestock, the government must immediately take wise steps to improve the welfare of breeders/farmers.

2. Literature review

2.1. Supply chain

Supply Chain is a system in an organization that distributes production goods and services to its customers. The production chain is a network from various interconnected organizations that have the same goals [28]. Supply chain refers to the flow of materials, information, money and services from suppliers of raw materials, through factories and warehouses to the final/end customer. A supply chain also includes the process organization for the production and delivery of products, information, and services to final customers [29]. Supply chain there are usually 3 types of flows that must be managed. First is the flow of goods from upstream to downstream. The second is the flow of money from downstream to upstream and its kind that flows from the downstream to the upstream. The third is the flow of information that can occur from upstream to downstream or vice versa [30]. Supply chain is a process of business and information that provides products or services from suppliers through the process of manufacture and distribution to consumers [31].

2.2. Types of distribution channels

Types of distribution channels according to [32] for consumer goods namely:

1. Producers-consumers: The simplest and the shortest form of distribution channel.
2. Producers-Retailers-Consumers: Also called direct distribution channels, but large retailers make purchases directly to consumers.
3. Producers-Wholesalers-Retailers-Consumers: Producers only serve large sales to wholesalers, not to consumers.
4. Producers-Agents-Retailers-Consumers: they never choose one agent, it is always more than one, the manufacturer chooses a commercial agent as a distributor.

5. Producers-Agents-Wholesalers-Retailers-Consumers: In this distribution channel, producers often use agents as intermediaries to distribute their goods to wholesalers who then sell them to small shops.

3. Research methods

The type of research used is a qualitative approach. The data presented is secondary data for the Broiler Chicken Meat commodity from March 2019–July 2020. Qualitative data analysis techniques use secondary data presented in descriptive form. The scope of this research is related to the national supply chain for chicken meat in Indonesia, which is the distribution of chicken meat from the point of producer to the point of final/end consumer. Qualitative data analysis techniques, which are descriptive according to [33] with the procedures:

1. Data reduction. Data reduction is defined as the process of selecting, focusing on simplifying, abstracting, and transforming raw data that emerge from written records in the field. Data reduction takes place continuously throughout the project, which is oriented towards the ongoing qualitative research. During data collection, the next stage of reduction occurs (summarizing, coding, searching for themes, creating clusters, creating partitions, creating memos). This data reduction/transformation continued after field research, until the report was completed. Data reduction is part of the analysis. Data reduction is a form of analysis that sharpens, classifies, directs, removes unnecessary, and organizes data in such a way that the final conclusions can be drawn and verified.

2. Data presentation. The data presentation is intended to make it easier for researchers to see the whole overview or specific parts of the research focus. [33] limits a presentation as an organized set of information that gives the possibility of drawing conclusions and taking action. They believe that better presentations are a major means of valid qualitative analysis, which includes: various types of matrices, graphs, networks and charts. All of them are designed to combine information that is arranged in a coherent and easily accessible form.

3. Draw conclusions/verification. Drawing conclusions according [33] is only part of one activity from the complete configuration. Conclusions were also verified throughout the study. Verification may be as short as a rethink that crosses the analyzer (researcher) s mind as he/she writes, a review of field notes, or it may become exhaustive and laborious with review as well as an exchange of ideas among peers to develop inter-subjective agreements or also broad efforts to place a copy of a finding in another set of data.

The sample in this study is the commodity chicken meat in Indonesia, the steps of the research activity are described in the following chart:

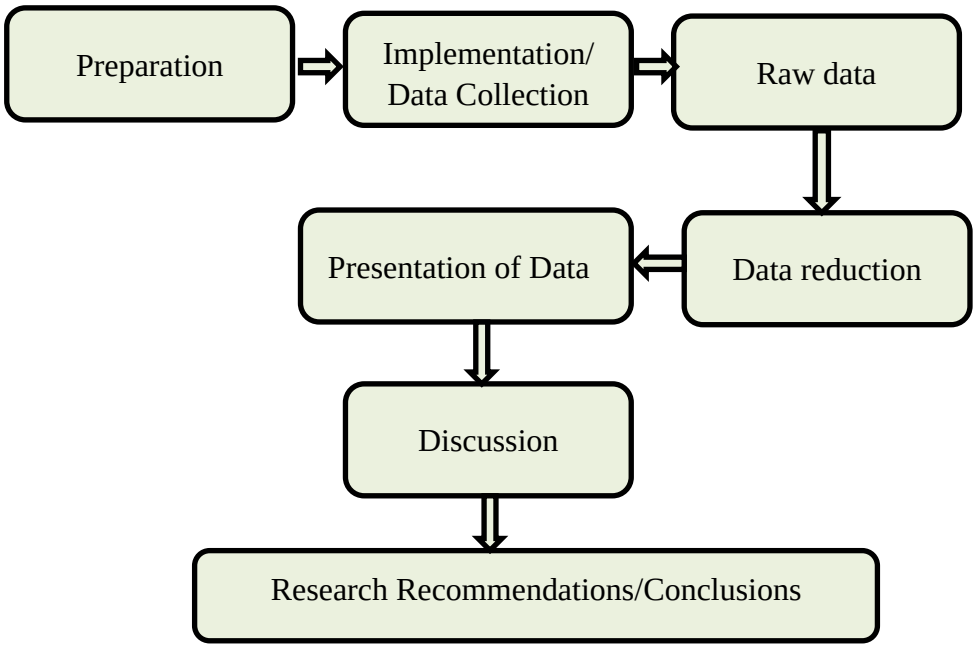

Figure 1. Chart of the progress of the research process.

This study examines the socio-economic impacts caused by the Covid-9 pandemic on the chicken supply chain in Indonesia. So that entrepreneurs and consumers of chicken meat: broiler breeders, distributors and consumers know the importance of supply chains in emergencies such as what is happening now in the world. Breeders and distributors get valuable lessons for food security, independence/sustainability and business sustainability. According to the opinion of [8] that a broiler supply chain entrepreneur can survive and be sustainable if the entrepreneur has passed many risk barriers during operation and his manager monitors the work of employee personnel at all times.

4. Results and discussion

4.1. Chicken meat production in Indonesia

According to the [34] the six largest chicken meat producing provinces in Indonesia (above 100 thousand tons) are West Java 25.37%, Central Java 19.02%, East Java 14.61%, Banten 6.39%, North Sumatra 4.45%, and Riau 3.11%. Others as much as 26.00% spread over 28 provinces in Indonesia are on the islands: Java, Sumatra, Kalimantan, Sulawesi, Bali, Nusa Tenggara Islands, Maluku Islands and Irian (Papua) for details in Table 1.

In Table 1, other provinces based on the archipelago region in 2019 South Kalimantan Province is the province that produces the most broilers on the island of Kalimantan with a total of 94787.32 tons. The Province of Sulawesi Island which produces the most broilers is South Sulawesi with 83543.68 tons. The island of Bali and the islands of Nusa Tenggara that produce the most broilers are in Bali Province with a total of 78389.68 tons. For Maluku Island and Irian Island (Papua), the province which produces the most broilers is Papua with 799.96 tons.

Table 1. Province with the Largest Chicken Meat Production in Indonesia in 2019.

Province	Production (tons)	Contribution to National Production (%)
West Java	886754.09	25.37
Central Java	664679.84	1.02
East Java	510532.51	14.61
Banten	223250.35	6.39
North Sumatra	155367.17	4.45
Riau	108729.88	3.11
Others	908740.49	26.00
Total	3495090.91	100.00

Source: BPS, processed.

4.2. Distribution pattern

Trade distribution business actors who play a role in distributing chicken meat from producers to final consumers in Indonesia, namely distributors, sub-distributors, agents, wholesalers, and retail traders including supermarkets/ hyper marts [34]. In this survey, the distribution of chicken meat starts from producers in the province who sell their products through intermediary traders, both wholesalers and retailers who are in their own territory. The wholesalers traversed can be one or more than one wholesaler to meet consumer demand, trading business actors can also buy supplies of chicken meat from other traders outside the province. This purchase can be made by wholesalers and retailers.

The survey results also showed that the distribution of broiler chicken meat from producers and wholesalers was also marketed to other business activities, such as restaurants. To reach final consumers, besides being marketed to traditional retail traders, the supply of chicken meat from producers and wholesalers is also distributed to supermarkets/hyper marts [34]. This indicates that consumers of chicken meat in Indonesia include all groups, from low to high income.

The distribution pattern of the broiler chicken meat trade in Indonesia is described in detail in based on the distribution pattern of broiler chicken meat trade in Indonesia in Figure 2, it can be concluded that the main pattern of distribution of broiler chicken meat trade in Indonesia is:

The number of chains in the main pattern of distribution of the broiler chicken meat trade that is formed in Indonesia from producers to the final consumer there are two.

Its main distribution involves one intermediary trader, namely retail traders.

Figure 2. Distribution pattern of broiler chicken meat trade in Indonesia.

4.3. Supply chain

The supply chain system for broiler chickens meat in Indonesia is generally a distribution channel for chicken meat from the producer point to the final consumer. The distribution channel passes through several marketing agencies (distributors). In running the production of breeders and farming companies get input supplies in the form of chickens (DOC), vaccine and medicines from suppliers,

as well as suppliers of raw materials for animal feed in the form of corn and other materials, as shown in Figure 3. Production input providers provide support to breeders/farmers, and livestock companies carry out the chicken fattening. The next flow is from the farmer/breeder to the company or to the wholesaler or retailer. From wholesalers and retailers, it is continued to traditional markets, modern markets (supermarkets, hyper mart) and to restaurants, then respectively to the final/end consumer.

Chicken meat supply chain system in Indonesia is relatively long and complicated. Intermediary traders (retailers, collectors/distributors) take a very central position in distribution, as seen in Figure 3. The supply chain has dynamic state but involve three constant flows, namely: information flow, product flow and money flow [35]. In the chicken meat supply chain system, there are three important aspects that need attention; the first is the flow of chicken meat products from producers to final consumers. The second is the financial flow in the form of money received by the seller from the buyer, as part of the remuneration for the capital and profits received and the third is the flow of information that occurs throughout the distribution chain. The flow of information is very important because it determines the smoothness and efficiency in the supply chain system. In controlling and managing price information wrongly, quantity and position of product demand and supply, then the policy to be taken will be ineffective.

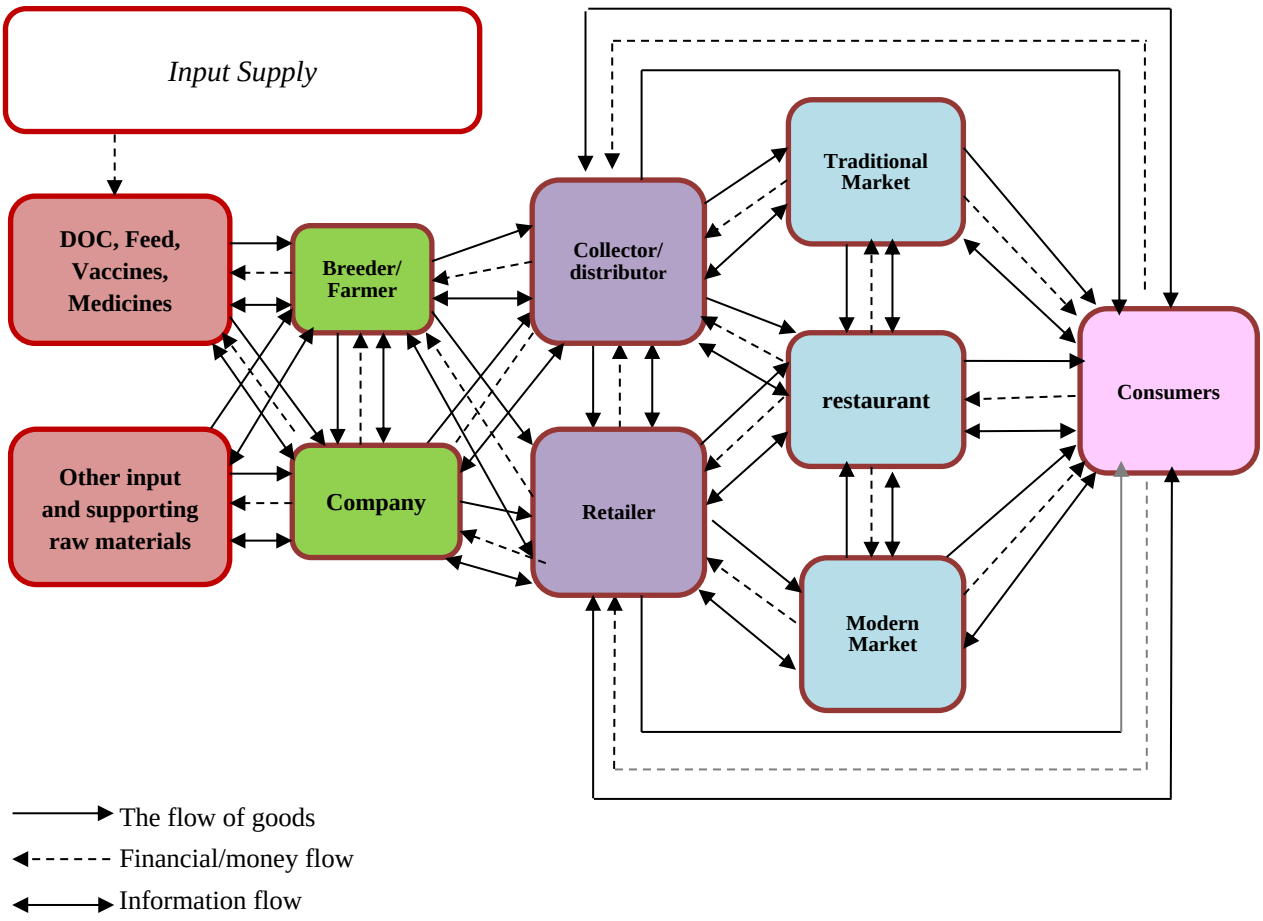

Figure 3. Chicken meat supply chain system generally in Indonesia.

The impact of the Covid-19 pandemic had a major impact on the supply chain of chicken meat in Indonesia, especially attacking the logistics system as a means of providing food for the community. As a result, price disparities among the regions are large, price movements are extreme and pattern less (uncertainty), consumption and production decline sharply, imported products are blocked, and labor has decreased drastically. The supply chain system is disrupted due to obstruction by the distribution system so that production accumulates at the producer level, prices decrease while demand also decreases due to decreasing purchasing power, however, in areas with stable demand, high prices and lower purchasing power as a result of the layoffs of many workers. As a result, producer profits decreased. When compared to prices at the producer and final consumer levels, before the co-19 average share received by breeders (breeder share = bs) of broiler chicken meat in 2018 and 2019 ranged between 46.64% and 47.89%, but in the Covid-19 period between June-July 2020 the breeder share was around 49.59%. The Bs figure seems to be getting bigger or closer between the producer price and the price at the consumer, but the level of profit is lower because many products cannot be sold because distribution is obstructed, while demand also decreases due to reduced consumption and reduced purchasing power and reduced economic activity and production.

Table 2. Marketing Margin (MM) for broiler chicken meat in the period of March 2019–March 2020 (the same period before Covid-19 and after Covid-19).

Year	March	April	May	June	July	Mean
2019	Rp16350	Rp15700	Rp15800	Rp15700	Rp14750	Rp.15660
2020	Rp14600	Rp15450	Rp15450	Rp13800	Rp14350	Rp.14730

The marketing margin between producer markets and consumer prices in traditional markets shows a fairly large price difference between before and after the Covid-19. The average marketing margin (MM) for chicken meat in the last six months entered the peak of Covid-19 in the period of March 19th–July 2020 amounting to Rp.14730/kg. While the same period in the previous year (2019), MM amounted to Rp.15660/kg or decreased by Rp.930/kg.

4.4. Economic impact

The spread of the Covid-19 outbreak in a number of countries has shaken the world economy. A number of countries partnering with Indonesia, such as Singapore, experienced negative economic growth of-2.2, Hong Kong-8.9, European Union-2.7, and China-6.8. Several countries are still experiencing positive growth but experiencing a decline, among them the United States fell from 2.3 to 0.3, South Korea from 2.3 to 1.3, and Vietnam from 6.8 to 3.8. In Indonesia, the economy declined from 4.97 to 2.97 [20]. In fact, due to this pandemic, world institutions, including the IMF, predicts world economic growth will be -3 percent and The Economist Intelligence Unit estimates world economic growth will decline 2 percent due to the Covid-19 pandemic [36].

In Indonesia, the Covid-19 virus has a significant and massive impact because it has an impact on the cessation of vital sectors, one of them is the food distribution sector, especially chicken meat. Many entrepreneurs have complained that the price of chicken meat on the market has decreased drastically with losses reaching 5 to 6 thousand per kg [37].

The Association of Poultry Breeding Companies/*Gabungan Perusahaan Pembibitan unggas* (*GPPU*) revealed that the drop in the price of chicken meat on the market was due to an oversupply,

while the demand from the public had decreased. This is compounded by the existence of social distancing and physical distancing policies imposed by the government. This policy has an indirect impact on decreasing demand for chicken meat in hotels, caterers, restaurant and tourist attractions. In addition, the elimination of mass activities, such as weddings or events involving large crowds of people have a major impact on the demand for chicken meat. The impact of Covid-19 on the livestock sector, namely disruption of supply chains for seeds, feed and medicines, operations, distribution and marketing [38].

Supply chain disruption causes imbalance between supply and demand. The high supply of products while demand drops followed by an uncontrolled fall in meat prices. Demand reduction reached 30–40% and the weight of chickens sold above 1.7 kg. The fall in meat prices due to over supply have lowered the income of breeders [39]. Over supply has also caused a decline in livestock production due to the cancellation of chick-in at several livestock businesses. The over supply that occurs at these breeders makes breeders look for ways to destroy chicken seeds to reduce costs in an effort to balance the balance sheet. This is done at the initiative of each breeder/farmer so that it is not recorded by the ministry of agriculture [40].

4.5. Breeders threatened by the bankruptcy

The Covid-19 pandemic caused some problems in the livestock industry. Covid-19 causes acute food crisis and insecurity in Somalia, Afghanistan and East Africa, disruption of transportation and falling prices for food products in Bangladesh, trade barriers for food importing countries such as the Caribbean, Ecuador, Venezuela [41]. The Covid-19 outbreak also struck many processing plant workers in Brazil, decreasing poultry production by 50% in Bangladesh [42].

From January to May 2020 the food provider/ restaurant group experienced inflation of 0.08% and transportation by 0.87%. Deflation occurred in the food group namely equal to 0.32% [43]. The pressure in the distribution process in other sectors, making chicken breeders threatened bankrupt. This is due to the increase in feed costs and transportation costs so that breeders are forced to sell chickens at prices far below the standard market price. This was taken considering the relatively short harvest period for chickens. If the chickens still remaining, of course, they will spend a lot of feed which results in excess costs. Therefore, like it or not, breeders have to sell chickens at low prices. However, the decline in prices to spend the supply of chicken is also not enough to influence in the midst of the outbreak of the Covid-19 pandemic, due to the closures of the market and crowded centers on the basis of the PSBB policy.

4.6. Social impact

On March 18th, 2020, the World Health Organization issued a report on mental health and psychosocial issues by conveying instructions and several social considerations during the COVID-19 outbreak [3]. Due to doubts whether domesticated animals or other farm animals can transmit the coronavirus to humans, many people are reluctant to take care of their pets for fear of infected [44]. Meanwhile, people in the UK tended to care for more pets during the Covid-19 lockdown [45]. In addition, the Covid-19 pandemic was followed by fears of a potential surge in suicide, anxiety due to social isolation due to quarantine and social-distancing guidelines, fear, as well as unemployment and financial problems [46–52].

The increasing spread of the Covid-19 virus has made communication between humans distant. The closure of public access, prevention of the crowd, and a reduction in mobility becomes inevitable in order to prevent the spread of this virus. Medical and government experts recommend staying at home and not meeting people outside on a large or small scale to prevent the spread of the virus. Such gatherings can be replaced by teleconferencing or by other means to maintain the social distancing and it has been considered a significant means of mental health during the pandemic [3].

The resilience of society in its social reality becomes more unstable, because it is shocked by the changes that have occurred. Social resilience is related to the resilience or ability of the community to use existing resources, such as food, security, work, and others in an effort to meet their basic needs. In the midst of this pandemic, social resilience is vulnerable because of reduced productivity, work disruption, and disturbance in the form of anxiety in the community. Currently, it can be said that the social life of people in Indonesia is facing turmoil due to social and physical distancing. This has resulted in the policy not running as expected, especially in the area of livelihoods. Informal workers, in this case especially chicken breeders, experience social vulnerability.

This is evidenced by the drastic decline in the epileptic market with losses reaching 5 to 6 thousand per kg [37] and the risk of bankruptcy of broiler breeders has an impact of termination of employment (PHK) to switch to work in the informal sector.

Proven by the survey results Central Bureau of Statistics 2019, the number of people who work with formal work status amounted to 55272.968 and the people who made their living in the informal sector amounted to 74093.224 people [53].This data shows that there are more Indonesian people whose work areas are in the informal sector so that social and physical distancing policies cannot run optimally. Informal workers are those who work outside the government, such as entrepreneurs, motorcycle taxis, laborers, farmers, breeders, and so on. Informal workers do not comply with government recommendations to carry out social and physical distancing because the job requires them to work to maintain their economy.

In addition to dealing with the problem of livelihood in the informal sector, the culture of Indonesian society is inadequate to carry out social and physical distancing. The characteristics of Indonesian society that are more ego-sectoral nature with a large demographic area that makes it difficult for the government to regulate the community to comply with social and physical distancing rules.

Social vulnerability can lead to a series of irrational actions that lead to forms of survival efforts. Irrational action, one of them can be in the form of panic buying. Panic buying conditions can be said to be a public response to the social changes that occur. Conditions like this actually add to new problems because automatically the prices of objects that are the target of panic buying experience a surge. As a result, hoarding mafias emerged that took advantage of this pandemic.

Starting from the things stated above, the same condition also affects chicken breeders in Indonesia. The closure of access roads, the removal of the crowd, closing of shopping centers, markets, besides having an impact on the wheels of the economy, this indirectly triggers social impacts. Restricted social distance inhibits the space for breeders because they have difficulty in distributing products. This becomes more difficult because breeders have to think of appropriate strategies so that the continuity of their businesses will survive in the midst of this pandemic outbreak. Breeders are being pressured to find ways to distribute their products due to social and physical distancing.

This policy becomes a challenge for chicken breeders because the population and transportation will be rarely found. This is supported by the characteristics of chicken breeders/farmers in Indonesia

who tend to be based on traditional or conventional breeders/farmers. Smallholder breeders/farmers generally consist of breeders/farmers with limited capital and resources. The difficulties faced by chicken breeders today are inseparable from the habit of conventional marketing of their products which relies on physical contact between buyers and sellers. Farmers still rely on the direct presence of buyers and traders. In Indonesia, it can be said that there are very few farmers who have used online networks to market their products, especially meat.

It is undeniable that technology awareness is becoming a major obstacle in marketing products. In addition, it is also supported by the nature of the meat which decomposes quickly if storage conditions are not right and there are demands to meet the needs. In the midst of social and physical distancing policies, breeders inevitably have to take the online system as a marketing effort. So far, the small holder livestock business has developed its business by partnering with large companies [36]. Large companies accommodate products from breeders to distribute to consumers. However, in the current situation, large companies are also experiencing the impact due to operational restrictions and production cuts. This will also impact on the efforts to terminate the business partnership.

As many as 80 percent of domestic breeders/farmers are dominated by conventional breeders/farmers. The covid-19 pandemic, on the other hand, has a huge social impact on the level of knowledge and technological literacy for conventional breeders. This pandemic forced conventional breeders to switch to technology by marketing their products more effectively by utilizing the sophistication of online-based technology. Thus, breeders/farmers who are slow in mastering technology can be certain that the sustainability of their businesses will be disrupted. It doesn't even rule out that it will slowly die. Therefore, the positive side of this pandemic is the change in distribution model changes as well as opening up opportunities, especially by conventional breeders/farmers.

4.7. Representation of the impact of Covid-19 on the socio-economy

There are three types of flows in the value chain to be able to see the impact of the Covid-19 pandemic on broiler chicken farming. The flows of value referred are material, financial and information. The three types of flow have a direction from upstream (upstream) to downstream (downstream) or vice versa [54]. The material referred flows from upstream to downstream, including the flow of livestock production facilities (sapronak) from sapronak supply companies to breeders, the flow of live chickens from breeders to brokers and chicken slaughterhouses *(RPA)*, and the flow of chicken meat from *RPA* to consumers. Financial flows from downstream to upstream, namely from consumers to producers, in the form of costs for purchasing chicken by consumers. Information flow occurs in two directions (upstream to downstream and vice versa). The downstream to upstream flow is formed due to the demand for chicken meat from consumers to producers; on the other hand, it is a producer response to consumer demand. The representation of value flows in the livestock business is presented in Figure 4.

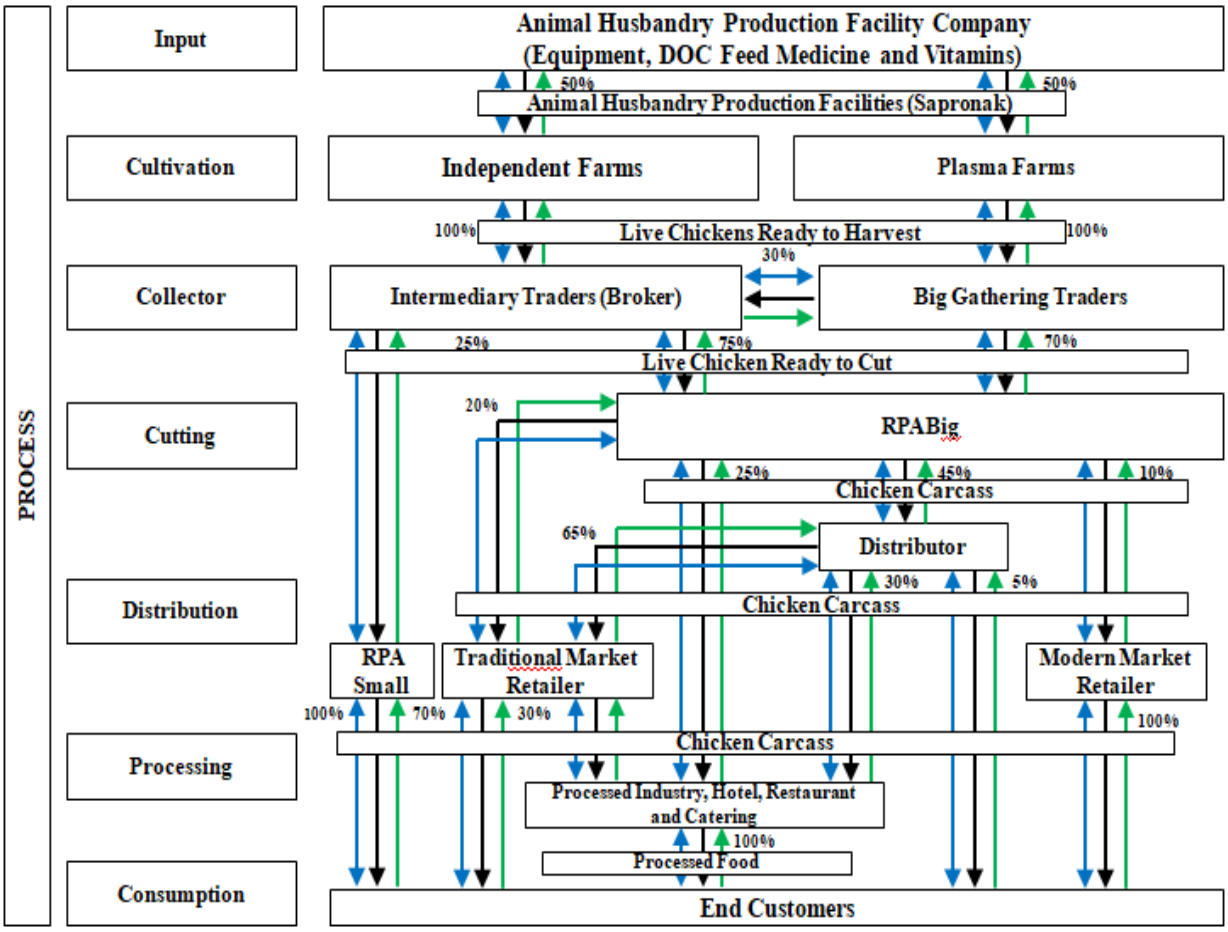

Figure 4. Value chain map of broiler chicken industry in Jombang Regency.
Source: Rahmatin N (2019).

Referring to Figure 4, there are two value groups in the distribution chain, namely consumer and non-consumption goods. Consumer goods are goods that can be used up during the distribution process in the form of financial, service and material (material depreciation). Non-consumption goods are goods that do not run out during the distribution process of livestock products and inputs (upstream-downstream). In the flow of consumer and non-consumption goods, Covid-19 affects the quantity and price of production as a result of the sluggish off-line market caused by the policy of breaking the chain of the spread of Covid-19.

A decrease in the amount of production, both livestock production and input production can increase the contribution of the livestock sub-sector to national inflation. Regions that experienced a surge in inflation due to Covid-19 are presented in Figure 5.

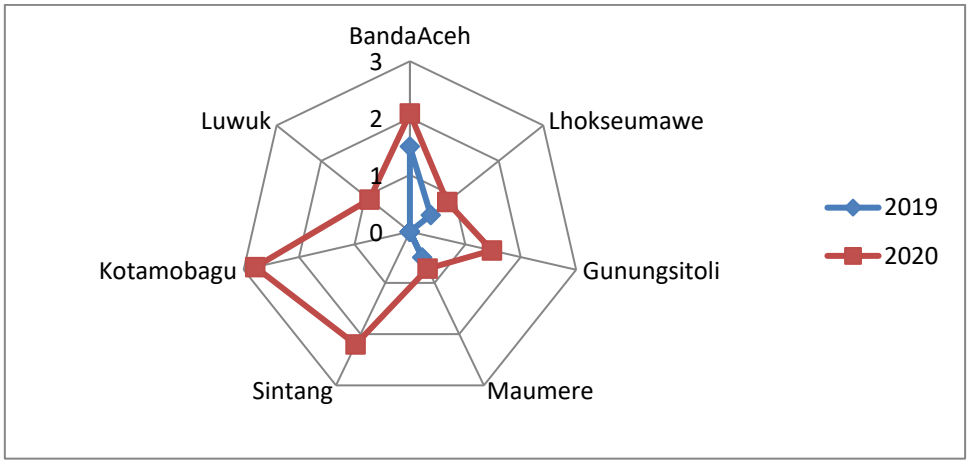

Figure 5. Graph of regions experiencing spikes in the inflation rate in the period of 2019–2020.
Source: data processed from BPS RI (2020).

The quantification of the spike in the inflation rate in the livestock sub-sector can be shown by the price index received by breeders falling by 1.39% as a result of a decrease in production of 1.81% and 0.68% of their derivative products. On the other hand, breeders have to pay a number of costs to meet the needs of the livestock business which results in an increase in the production cost index and an increase in capital goods by 0.09%. This condition has an impact on decreasing the fulfillment of farmer household needs by 0.27%. Therefore, the Covid-19 pandemic caused a decline in the exchange rate of breeders to reach 1.31% in the July–August 2020 period. More detailed quantification is presented in Table 3.

Table 3. Changes in Price Index Received and Paid by Breeders and the Amount Breeders Exchange Rate in 2020.

Sub sector, group and sub group	2020							Change
	February	March	April	May	June	July	August	Jul–Aug (%)
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1. Price index received by breeders	104.29	104.20	102.29	102.41	104.22	106.06	104.58	−1.39
1.1. Poultry	101.80	101.75	98.67	100.55	102.79	102.11	100.26	−1.81
1.2. Livestock	104.57	105.46	104.06	102.22	104.36	106.60	105.87	−0.68
2. Price index paid by breeders	106.18	106.20	106.12	105.96	106.04	106.12	106.04	−0.08
2.1. Index of household consumption	105.71	105.95	106.08	105.87	105.88	105.69	105.41	−0.27
2.2. Production cost index and addition of capital goods	106.40	106.30	106.06	105.91	106.06	106.33	106.42	0.09
2.2.1 Seeds	106.95	106.91	106.26	106.22	106.77	107.57	107.54	−0.03
2.2.2.Drugs and Feed	106.56	106.37	106.23	105.97	105.87	105.82	105.89	0.07

Continued on next pages

Sub sector, group and sub group	2020							Change
	February	March	April	May	June	July	August	Jul–Aug (%)
2.2.3.Rent & Other Expenses	102.31	102.37	102.46	102.50	102.74	102.82	102.85	0.03
2.2.4.Transportation	102.86	102.90	102.93	102.93	102.99	103.10	103.11	0.01
2.2.5.Capital goods	103.27	103.44	103.45	103.45	103.54	103.62	103.68	0.06
2.2.6.Farm Lab or Wages	106.54	106.61	106.61	106.6	106.62	106.86	106.96	0.10
3.Breeder Exchange Rate	98.23	98.12	96.40	96.66	98.29	99.94	98.64	−1.31

Source: BPS RI.

5. Conclusion

The theoretical implication found in this study is that during the Covid-19 pandemic, the Work From Home (WFH) policy caused the marketing flow of chicken meat to be hampered and the number of consumers experienced a decline so that to avoid an increase in production costs, breeders sell chicken meat at a lower than normal price of -1.81%. This is different from the economic theory that if prices decrease, consumer demand will increase.

The managerial implication found in this study is that during the Covid-19 pandemic, breeders marketed their production by utilizing online-based technology. Market information takes place from upstream to downstream. On the other hand, before the Covid-19 pandemic, market information took place from upstream to downstream or vice versa. Production marketing is carried out in a conventional manner.

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Conflict of interest

The author declares no conflicts of interest in this paper.

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