

Conference Paper

Broiler Farmers' Income and Supply Chain Recovery in Anticipation of the Coronavirus Outbreak

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ORCID<https://orcid.org/0000-0001-8882-0596>**Abstract.**

Covid-19 has become a pandemic. It negatively impacts various sectors and sub-sectors, including the livestock sub-sector that experienced income contraction and supply chain disruptions. This study aimed to analyze the broiler farmers' income before and in the time of the Covid-19 pandemic, examine the marketing channels, recommend anticipatory measures to maintain broiler farmers' income, and restore the distribution of broiler meat products. The study was conducted from July to August 2020 using primary data collected in 2016 in Bandung and Bogor regencies, involving 64 respondents implementing a purposive snowballing approach. The analytical method used is the revenue and costs analysis of broiler farming and supply chain analysis. The study results show that broiler farming was profitable and feasible in the independent pattern and internal and external partnership patterns. However, during the Covid-19 outbreak, farmers' profits fell by 37%–49%. The Covid-19 explosion caused a decrease in demand and disruption of live bird and carcass storage and distribution. The government should conduct a low-market program by buying broilers from community farms and direct assistance programs in the form of chickens, cut DOC oversupply, absorb excess stocks into food reserves, and stabilize the price of broiler meat.

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1. Introduction

From the end of 2019, Coronavirus disease 2019 (Covid-19) has become an epidemic and is officially declared a pandemic. Covid-19 has spread to various countries, including Indonesia, which has claimed many lives and harmed various sectors, including the agricultural sector.

The impacts of the Covid-19 outbreak in the agricultural sector can occur at various levels, ranging from the distribution of inputs and labor supply to trading of agricultural products to consumers, disrupting agricultural products' production and distribution.

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The possibility of this disruption must be anticipated so that the community's food and nutrition needs can be met.

In 2013, Indonesia produced more than 2 billion broilers and provided approximately 65% contribution to national meat needs [1]. There are at least three broiler business patterns: independent pattern, internal partnership pattern, and external partnership pattern. In the independent pattern, farmers get inputs from Poultry Shop (PS) and/or other suppliers. In the internal partnership pattern, inputs are supplied in the form of DOC, feed, medicines, and vaccines from feed mill companies (nucleus). In the external partnership pattern, plasma farmers receive inputs in the form of DOC, feed, medicines, and vaccines from the financiers (nucleus) that are their partners [2][3][4].

Various problems have existed for a long time in the broiler industry [5][6][7][8][9][10]. These problems are related to the amount of supply, fluctuations in raw material prices, inefficient marketing, inefficient partnership systems, and the poultry industry's high vulnerability to disease outbreaks and the global crisis. In addition to the existing problems, the Covid-19 outbreak will cause additional problems in the broiler industry. If these problems continue, it will increasingly create uncertainty in the broiler industry's business, decreased broiler production capacity, inefficient broiler marketing systems, and the existence of independent farmers. This fact shows the need to analyze the aspects of income and marketing of broiler production that are disrupted by the Covid-19 outbreak, and the anticipatory actions for the short and long term so that the broiler industry still exist, competitive, and sustainable.

In general, this paper aims to analyze the contraction of broiler business revenue and efforts to restore its meat supply chain in the era of the Covid-19 outbreak. In detail, the objectives of the study are to (1) analyze broiler business income before and in the time of Covid-19 pandemic; (2) determine the dominant supply chain and its problems in the time of Covid-19 pandemic; and (3) recommend anticipatory measures to maintain the income of broiler farmers and restore the distribution of broiler meat products.

2. Materials and Methods

The analytical method used in this study consists of two analytical tools, namely the analysis of the production cost and revenue structure [11][12] and supply chain analyses [13][14]. Analysis of production costs and revenue is complemented by analyzing the cost of inputs, revenue, and R/C ratio. Meanwhile, supply chain analysis will focus on determining dominant supply chains in the study site and problems that occurred in distributing products.

The impact of the Covid-19 outbreak on the broiler business was carried out by lowering live bird prices due to an abundance of supply and reduced demand. The assumption used is that the input supply and the price have not changed due to the Covid-19 outbreak.

The study was conducted from July to August 2020 using primary data collected in 2016 in Bandung and Bogor regencies, including 64 respondents implementing a purposive snowballing approach. The respondents included broiler farmers, core companies, chicken slaughterhouse (RPA), collectors/brokers, wholesalers, and retailers.

3. Results and Discussion.

Broiler farming is mostly conducted in partnership patterns, although a limited number of the independent pattern is still found. At this time, independent farmers who can survive are medium to large scale ones. This study analyzed the cost structure of independent broiler farming at a business scale of 20,000 birds, internal partnership at 7,000 birds, and external partnership at 5,000 birds. Table 1 presents the cost structure and financial revenue of broiler farming in the independent, internal partnership, and external partnership patterns.

The value of the R/C ratio in the independent pattern, the internal partnership pattern, and the external partnership pattern are 1.29, 1.19, and 1.19, respectively. Based on the indicators of financial feasibility, it shows that broiler farming at various business scales is profitable and feasible to continue.

The Covid-19 outbreak caused a decrease in demand for broiler meat as a result of the closure of the hotel, restaurant, and catering businesses. The decrease in demand for broiler causes carcasses to accumulate in the Chicken Slaughterhouse and cold storage. The result is skyrocketing stock, and prices at the farmer's level have fallen dramatically. The price of live birds at farmer's level only reached an average of IDR12,500/kg.

Assuming that production costs per kg of live birds are fixed or the same before and during the Covid-19 outbreak as shown in Table 1, it can be seen that both independent and partnership farmers have suffered losses ranging from IDR4.700/kg to IDR6.100/kg (37% to 49%).

Independent farmers can freely sell their broiler production to anyone, while partnership farmers can only deliver their products to the core company. The biggest source of live birds comes from the core company because 90-95% of farmers are partnership farmers, while only 5-10% are independent farmers. The sale of live birds by the core

TABLE 1: Cost structure and financial revenue of broiler farming in the independent, internal partnership, and external partnership patterns.

No.	Items	Independent (20,000 birds)	Internal partnership (7,000 birds)	External partnership (5,000 birds)
I.	Production costs	(IDR)	(IDR)	(IDR)
1.	DOC (bird)	110,000,000	42,000,000	31,500,000
2.	Feed (kg)	341,250,000	126,013,800	86,062,500
3.	Vaccine (IDR)	2,300,000	1,147,500	850,000
4.	Medicine (IDR)	4,000,000	1,579,510	1,030,000
5.	Mineral/vitamin (IDR)	1,700,000	633,333	650,000
6.	Herbs (IDR)	500,000	500,000	200,000
7.	Molasses (IDR)	1,000,000	350,000	250,000
8.	Husk (sack)	7,500,000	2,625,000	1,875,000
9.	Sanitation (liter)	37,500	527,400	12,500
10.	Curtain (m)	1,500,000	15,000	2,500,000
11.	Heater cost (IDR)	9,600,000	3,360,000	1,350,000
12.	Other variable costs (water, electricity) (IDR)	5,000,000	1,750,000	1,632,500
13.	Depreciation (IDR)	4,843,750	2,000,000	100,000
14.	Transportation (IDR)	469,375	250,000	25,000
15.	Property tax (IDR)	78,000	35,000	900,000
16.	Other costs (IDR)	3,270,000	1,144,500	1,166,667
17.	Family labor (man)	2,333,333	1,166,667	2,333,334
18.	Outside family labor (man)	4,666,667	2,333,334	-
	Total cost (IDR)	500,048,625	185,681,044	132,447,501
II.	Revenue			
1.	Live bird (kg)	632,897,600	220,310,800	155,913,000
2.	Culling birds (kg)	7,848,000	750,000	350,000
3.	Manure (kg)	2,571,400	900,000	642,000
	Revenue (IDR)	643,317,000	221,960,800	156,905,000
III.	Income (IDR)	143,268,375	36,279,756	24,657,499
IV.	R/C	1.29	1.19	1.19
V.	Production cost (IDR/kg)	17,224	18,373	18,519
VI.	Selling price (IDR/kg)	21,800	21,800	21,800
VII.	Profit (IDR/kg)	4,576	3,427	3,281
	April–Mei period, 2020 (Covid-19 era)			
IX.	Selling price (IDR/kg)	12,500	12,500	12,500
X.	Loss (IDR/kg)	-4,724	-5,873	-6,019
XI.	% loss	37.79	46.98	48.15

Source: Before pandemic Covid-19, data in this table was accommodated from [17] after pandemic Covid-19, data was computed from [18]

company is carried out by the Delivery Order (DO) sales system at a price determined by mutual agreement through the institutional PINSAR called the Posko price (Figure 1).

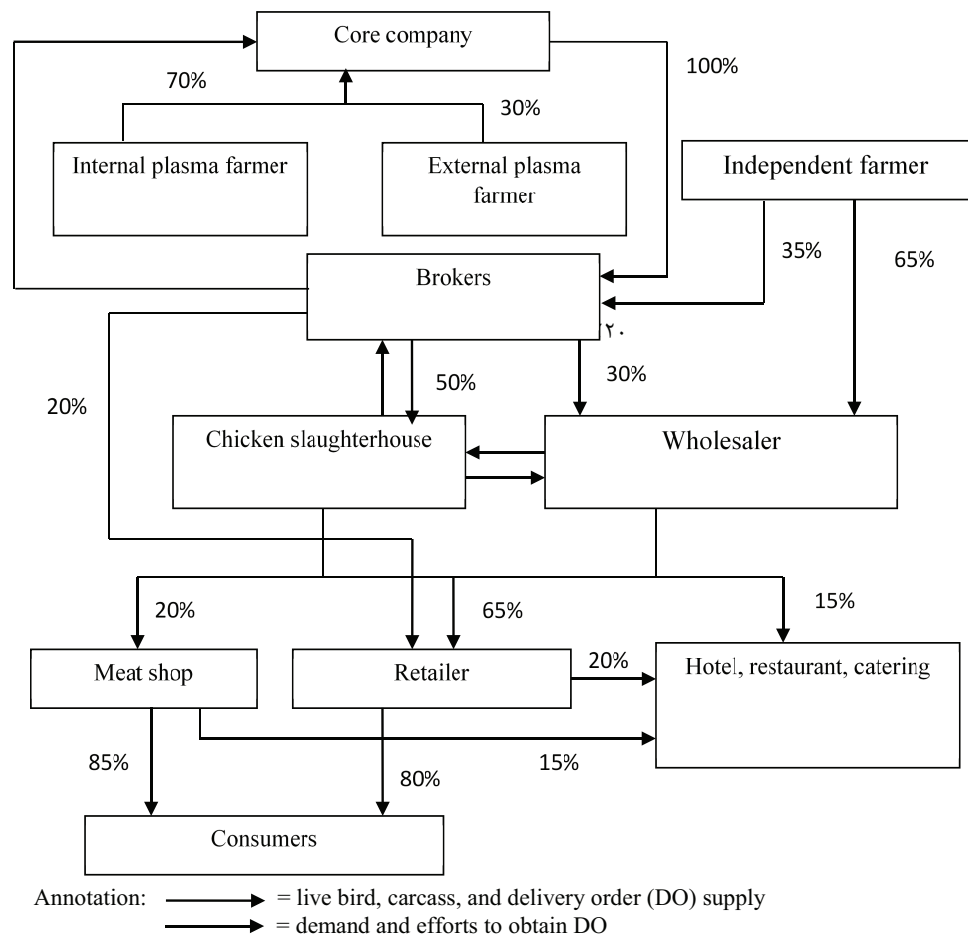


Figure 1: Broiler supply chain.

Traders/brokers take live birds from farmers’ cages that have been designated by the core company. Collecting traders then sell live birds and/or carcasses to several traders, namely wholesalers, retailers, and meat shops. The wholesalers then sell carcass to retailers, meat shops, and HORECA (hotel, restaurant, and catering).

The Covid-19 outbreak disrupted the distribution of live birds and carcasses. From the existing supply chain, several main problems occurred due to the Covid-19 outbreak. The poultry feed industry’s raw material supply, which mostly must be imported due to import restrictions due to the Covid-19 outbreak, is hampered. The inefficient marketing system and the indication of an imbalance in market structure in the input and output markets have put independent farmers in an increasingly weak position compared to before the Covid-19 outbreak. Broiler business partnerships have not been running optimally, so coordination of products and actors has not been integrated in the time

of the outbreak. The broiler industry is very vulnerable to external shocks, such as economic crises, epidemics, and the global financial crisis.

The Covid-19 outbreak reduced demand for carcasses in communities, hotels, restaurants, and caterings. Even though in February and March 2020, there was a surge in demand due to panic buying at the beginning of the Covid-19 pandemic, in the following months, demand decreased due to decreased consumers' purchasing power and the closure or reduction of hotel, restaurant, and catering activities (Figure 2). According to [18], the right steps are needed in rearranging the production system and supply chain of broilers to the position of "the new normal" amid the Covid-19 pandemic which requires changes in all segments of the agribusiness value chain.

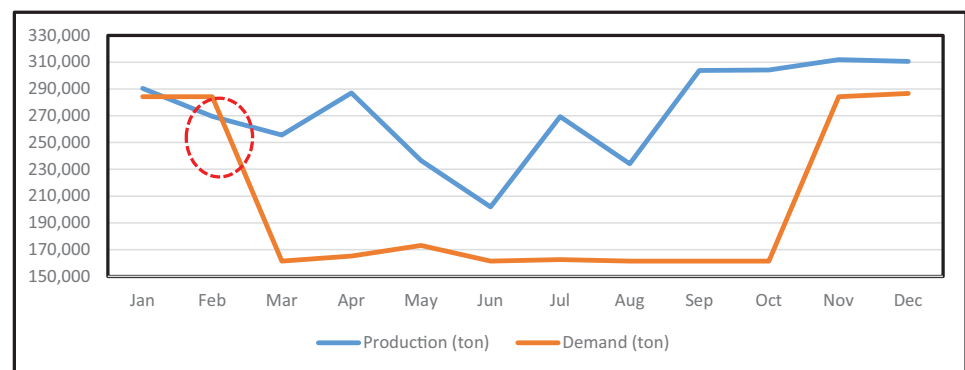


Figure 2: Production and demand for broiler meat during the Covid-19 outbreak (Jan–Oct 2020) and their projections (Nov–Dec 2020) [15].

The Covid-19 outbreak has increased the price of inputs, especially day-old chicken (DOC) and animal feed. The phenomenon of soaring corn prices due to corn import restrictions have caused soaring feed prices. The worst is the fluctuation of broiler prices at both the producer and retail levels where the price can plummet so quickly that it reaches IDR8.000/kg of live birds at the farmer level, then rebounds again in a short time. Suppose these problems continue for a long time. In that case, there is a concern that it will create uncertainty in the broiler industry business, a decrease in broiler production capacity, an inefficient broiler marketing system, and increasingly independent existence of independent farmers. The right steps are needed in rearranging the production system and supply chain of broilers to the position of "the new normal" amid the Covid-19 pandemic, which requires changes in all segments of the agribusiness value chain [16].

4. Conclusion

Broiler business in the independent and internal and external partnership patterns is profitable and feasible. The most significant profits are received by independent farmers, followed by internal partnership farmers and external partnership farmers. However, independent farmers who can survive are medium and large scale ones. The Covid-19 outbreak has caused broiler farmers to suffer losses, ranging from IDR4.700/kg to IDR6.100/kg (37% to 49%).

The Covid-19 outbreak disrupted the distribution of feed raw materials, distribution of live birds and carcasses, decreased demand, and increased carcass prices. The Covid-19 outbreak increased the price of inputs, especially DOC and broiler feed. The phenomenon of soaring corn prices occurred due to the restrictions on imports that cause soaring feed prices.

There should be an immediate market program where the government facilitates buying chickens from community farms and a direct assistance program in the form of chickens, not only rice and cash. The more important action is to cut oversupply since the DOC stage.

The excess of carcass stock must be absorbed into national food reserves. The stocks at the chicken slaughterhouse (RPA) and cold storage can now be reduced and transferred to the government so that partnering farmers can put their products back into the RPA at reasonable prices. The government reduced the supply of DOC by 40% during a specific period so that the price of live birds at the farmer level could rise according to the Ministry of Trade's reference price.

Developing a broiler business in an integrated area and implementing an integrated supply chain management to build an integrated product process and integration among actors are among the strategies that can be implemented. Furthermore, broiler production should be oriented to meeting consumer needs. The objectives and segments of the broiler market must be clear. The importance of changing marketing strategies from conventional market strategies to digital or virtual market strategies should also be considered.

Several strategies that can be implemented are: (a) developing a broiler livestock business in an integrated area; (b) Implementing an integrated supply chain management so as to build an integrated product process and integration between actors; (c) Oriented to meeting consumer needs; (d) The objectives and segment of the broiler market must be clear; and (e) The importance of changing marketing strategies from conventional market strategies to digital or virtual market strategies.

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