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Test The Production Performance of Broiler Chicken with Partnership System Based on Production Factors

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Abstract. Broiler farming using the plasma core partnership system is a partnership system between 2 (two) parties who cooperate. The first party is a poultry company that acts as the core as well as the owner of capital (that suplies DOC, feed and drugs, vaccines, and chemicals/OVK) and the second party is farmers who act as the plasma as well as the farmers of broiler chickens. This study aims to evaluate the success of broiler farming business with the plasma core partnership system. The research was conducted using research desk and descriptive analysis approaches. The primary data was obtained from in-depth interviews (oral survey) with farmers and poultry companies and questionnaire filling method (written survey). The interviews were conducted interactively with both parties, the core and the plasma, in order to uncover the data, facts, and reality of the plasma core partnership system of broiler chickens consisting of 185 respondents (total sampling). The secondary data was obtained from the partnership contract data, the recording of broiler chicken rearing (recording) during the production period, and the Recapitulation of Farmer Rearing Results (RHPP) in a population of 2,000 chickens. The results showed that broiler chicken farming with plasma core partnership system costs poultry production facilities amounted to Rp 71,528,032.00 with the provisions of DOC costs of 22.36 percent, feed costs of 76.87 percent, and drugs, vaccines, and chemicals (OVK) costs of 0.75 percent. The sale of chicken was Rp 74,028,080.00 with a harvest age of 35.00 days with an average weight of 2.02 kg. The number of chickens harvested was 1,885, meaning the depletion level was 5.75 percent. FCR value was 1.746 with an IP value of 311.57. The conclusion was that the overall rearing of broilers carried out by plasma farmers was categorized as fair. The overall income of plasma farmers was Rp 2,690,448.00 (after added by FCR bonus). Based on the research findings, it is recommended that to achieve a high IP one must be able to minimize chicken depletion rates and feed FCR.

Keywords: broiler, contract farming, partnership system

INTRODUCTION

Livestock business partnership according to the Regulation of the Minister of Agriculture No. 13 of 2017 (PERMENTAN Number 13/2017) is a cooperation between livestock businesses based on the principle of mutual need, strength, benefit, respect, responsibility, and dependence. Livestock business partnerships have been carried out by Indonesian people with various types of livestock commodities [1]. These types of partnerships and livestock commodities include the profit-sharing partnership system for beef cattle [2-3], and broilers [4-6], the common trading pattern partnership system for dairy cattle and broilers, the subcontracting partnership system and the plasma core for sheep and broilers [7-8].

One of the livestock partnerships is the plasma core partnership system for broiler commodities [9-10]. Broiler farming using the plasma core partnership system is a partnership system between 2 (two) parties who cooperate, in which the first party is a poultry company that acts as the core as well as the owner of capital and the second party is farmers who act as the plasma as well as the farmers of broiler chickens [11-12]. The broiler partnership system is carried out solely due to limited resources. These limitations include business capital, technology, harvest prices that tend to change following the market prices, as well as limited access to market information, so partnership is one alternative to obtain business capital [13-14]. The main problem in small-scale broiler farming is low efficiency. Therefore, small-scale broiler farmers often run their businesses by partnering with companies [15-17].

Business capital is one of the financial resources in the livestock business. Through the plasma core partnership system, farmers receive business capital assistance or operational assistance in the form of procurement of Day Old Chickens (DOC), broiler chicken feed during the rearing period, as well as drugs, vaccines, and chemicals (OVK), while farmers only provide cages and labor [18-19]. Business capital assistance is another form of farmers' debt that must be paid. The farmer repays the debt with chicken meat produced during the rearing process of broiler chickens. The excess meat from the amount of debt is then expressed as the farmers' income of the plasma core partnership system [20-21].

Broiler chicken partnership has its appeal for farmers considering the relatively short production period and the high demand of domestic consumers [22-24]. Ironically, farmers as plasma are often in the weak bargaining power. Hence it depends on how the farmers' efforts to increase the productivity of their poultry, and their efforts to make broiler chicken farming feasible [25-26]. Broiler chicken partnership is expected to increase the folk farmers's income and ensure the the poultry business' sustainability. In other words, the broiler chicken partnership is actually part of the empowerment of the folk farmers [27-28].

Various research and academic studies have been carried out on broiler partnership systems, especially the plasma core partnership system, including financial analysis, business production analysis, comparative analysis of partnership cooperation patterns, business income analysis, business partnership pattern analysis, profitability analysis, feasibility analysis, business analysis, business risk analysis, technical efficiency of poultry business, to development strategy of broiler chicken business [29-30]. Ironically, those research and studies have not led to Index Performance (IP) or a number indicating the success rate of broiler production in 1 (one) period obtained by farmers in the plasma core partnership system [31-33].

IP value is part of the data on the performance of farmers' rearing, which is the achievement value of plasma farmers in running the broiler partnership system. The IP value is part of the Recapitulation of Farmer Rearing Results (RHPP) issued by the core company to evaluate the production process of farming broiler chickens run by plasma farmers. RHPP document is an essential document for evaluating partnership contracts, so it is confidential [11-13]. The aim of this research is to observe the broiler chicken plasma core partnership based on the performance of broiler chicken farmers which includes the number of harvests (heads), the number of harvests (kg), the average weight of broiler chickens (kg), the average age of broiler chickens (days), depletion (percent), Feed Conversion Ratio (FCR), and IP value.

MATERIAL AND METHOD

The research was conducted on broiler chicken partnerships at Kandang DAU, Malang Regency, in 2024. The partnership was carried out with the plasma core partnership system. The primary data was obtained from in-depth interviews (oral survey) with farmers and poultry companies and questionnaire filling method (written survey). The interviews were conducted interactively with both parties, the core and the plasma to uncover the data, facts, and reality of the plasma core partnership system of broiler chickens consisting of 185 respondents (total sampling). The secondary data was obtained from the partnership contract data, the recording of broiler chicken rearing during the production period, and the Recapitulation of Farmer Rearing Results (RHPP) in a population of 2,000 chickens.

The focus of this research is to review broiler chicken farming using a plasma core partnership system on a micro scale (The broiler chicken population is less than five thousand) with open cages. This review is a pilot project in developing a broiler chicken partnership system policy in Indonesia in accordance with PERMENTAN Number 13/2017 concerning the Livestock Business Partnership System and PERMENTAN Number 14/2020 concerning Registration and Licensing of Livestock Businesses. The core party provided DOC, broiler chicken feed during the rearing period, as well as drugs, vaccines, and chemicals (OVK), while the plasma party provided cages and labor.

The RHPP document was issued after the broiler harvest completed, generally 3-7 days after the last harvest, if the harvest was done in stages. RHPP documents generally included: 1) operational costs calculated as payable by plasma to the core party consisting of: a) the amount of DOC populations received by plasma, b) total feed used (mathematical formula 1), and c) OVK procurement costs; 2) Farmer performance; and 3) income. Performance indicators of plasma farmers were measured through: a) the number of harvested broiler chickens (heads), b) the average age of harvest (days), c) the average weight of broiler chickens at harvest (kg), d) depletion (percent), e) FCR, and F) IP. The data analysis method uses descriptive statistics (without hypothesis testing).

Total feed used (x) in the RHPP document was the difference between the feed sent and mutated feed. The following is the mathematical calculation of total feed used:

$$x = a - b \quad \text{.....(1)}$$

Description:

x = feed used

a = feed sent (from core party to plasma party)

b = mutated feed (if any) (kg) [5,6]

Feed Conversion Ratio (FCR) is the conversion of broiler chicken feed to meat production. FCR was used to determine how much feed was spent to produce broiler chicken meat. FCR value (c) was obtained from the total feed spent during the rearing process (kg) divided by the total weight of live chickens (kg). The smaller the FCR, the better. The following is the mathematical calculation of the FCR value.

$$x = \frac{f}{w} \text{ …….....(2)}$$

Description :
c = conversion of broiler chicken feed to meat production
f = total feed spent during the rearing process (kg)
w = total weight of live chickens (kg)

[5,6]

Index Performance (IP) is the achievement value of plasma farmers in running the broiler chicken business partnership system. IP is a number that shows the success rate of broiler production in 1 (one) period. The IP value is influenced by FCR, chicken mortality rate (depletion and mortality), broiler weight, and broiler harvest age. The shorter the harvest life with a great chicken weight, the better the IP value. The higher the IP value, the better the production performance. The following is the mathematical calculation of IP value:

$$IP = \frac{Lb\ x\ Aw}{FCR\ x\ Ui} \times 100 \text{…….....(3)}$$

Description:
IP = IP value in 1 (one) period
Lb = percentage of live broilers (%)
Aw = average weight of broilers (kg)
FCR = FCR value 1 (one) period (mathematical formula 1)
Ui = age of broiler at harvest (days)

[5,6]

Criteria of IP value for broiler chicken rearing are generally categorized into 5 (five): 1) poor with IP value <300; 2) fair with IP value 301-325; 3) good with IP value 326-350; 4) very good with IP value 351-400; and 5) excellent with IP value >400. Based on reality, sometimes the age of the broiler harvest is different because the harvest of broiler chickens is carried out in stages (not simultaneously). So, to calculate the age of the harvest mathematically is as follows:

$$Ut = \frac{\sum_i^n \ U_i\, xPt_i}{Tt} \text{……..(4)}$$

Description:
Ut = age of capture (days)
Ui = age of broiler chickens at harvest to-I, (i = 1, 2, 3, 4…..n) (days)
Pti = the number of broiler chickens cought (during the first harvest, I = 1, 2, 3, 4…..n) (heads)
Tt = total catch (number of broiler chickens caught/harvested) (heads) [5,6]

RESULT AND DISCUSSION

DOC Supply

DOC supply by the core company to plasma farmers was carried out in 2 (two) methods: DOC supply without vaccine and DOC supply with vaccine. The DOC with the vaccine was more expensive compared to DOC without the vaccine. DOC without vaccine meant that farmers did their own vaccination against DOC. The observation results in this research were that the DOC received by plasma farmers was already vaccinated. As of June 8, 2024, DOC transaction data is presented in Table 1.

TABLE 1. DOC Transaction Data on the Delivery of One Rearing Period

No.	Date	Price/Unit (Rp)	Total	Unit	Type	Nominal (Rp)
1.	June 8, 2024	8,000	2,000	Heads	CPI DOC CP707	16,000,000.00
					Subtotal	16,000,000.00

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

Table 1 shows that the DOC supply carried out by the core company to plasma farmers was vaccinated DOC. The vaccines used for DOC consisted of single vaccine and triple vaccine. The price of DOC with the single vaccine was cheaper compared to the triple vaccine. Generally, the difference was around Rp 100.00-200.00 per broiler chicken. The result of observation in this research case was that the DOC received by plasma farmers was the DOC with the triple vaccine. The triple vaccine consisted of Newcastle Disease (ND) active vaccine, Infectious Bronchitis (IB) active vaccine, and Infectious Bursal Disease (IDB) active vaccine.

The type of DOC sent by the core company was adjusted to the availability of DOC, although sometimes plasma farmers asked for special orders for certain types of DOC, but this was not necessarily fulfilled by the core company, unless the DOC schedule (chick in) was pushed back from the schedule set. This was one of the weaknesses of the plasma core partnership system because the core company did not produce poultry production facilities. This was different from the subcontract partnership system, where the core company was a company that produced poultry production facilities, such as DOC (owns broiler chicken breeding industry) and feed (owns animal feed industry), and even the core company has a business unit in the form of processing industries. The core company in this case was often referred to as an integrator company.

DOC supply received by plasma farmers was for 2,000 heads or net broiler chickens of 2,020 heads. It meant that per 1 (one) box, the farmers received 20 boxes, and each box had an excess of 1 DOC of chicken. A good broiler chicken DOC was: (i) healthy and had no defects; (ii) DOC's body was heat resistant; (iii) had a loud voice; (iv) had bright eyes; (v) DOC's physique was agile and nimble; (vi) ideal body weight of DOC was 40-45 grams/head; and (vii) issued by a trusted DOC supplier. DOC supply received by farmers of as many as 20 boxes indicated that the debt of farmers to the core company was Rp 16,000,000. It showed that the plasma core partnership system also helped plasma farmers as partners of the core company in terms of providing business capital due to limited resources owned by the farmers [34–36]

Feed Supply

Feed supply by the core company to plasma farmers was carried out in stages during the process of rearing broiler chickens. The observation result in this research case was that the feed supply by the core company was carried out 6 times. Feed supply per delivery was at most 2,000 kg and at least 150 kg. The feed supply received by farmers was the same as the DOC supply. Plasma farmers could propose special orders for certain types and brands of feed, but the core company did not necessarily approve the request considering the adjustment to the feed stock in the company's warehouse. Data on feed transactions during the rearing of broiler chickens are presented in Table 2.

TABLE 2. Feed Transaction Data During One Rearing Period for 2.000 Heads

No.	Date	Price/Unit	Total	Unit	Type	Nominal (Rp)
1.	07-06-2024	425,000	500	Kg	Sierad B 100 SPR	4,250,000.00
2.	07-06-2024	412,500	500	Kg	Sierad AS 100 B	4,125,000.00
3.	16-06-2024	412,500	2,000	Kg	Sierad AS 100 B	16,500,000.00
4.	25-06-2024	412,500	2,000	Kg	New Hope 811 B	16,500,000.00
5.	02-07-2024	412,500	1,000	Kg	Sierad FB 101	12,375,000.00
6.	13-07-2024	412,500	3,000	Kg	Sierad FB 101	1,237,500.00
			6,650		Subtotal	54,987,500.00

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

Table 2 shows that plasma farmers' feed supply for broiler chickens during the rearing period consumed up to 6,650 kg of feed for 2,000 heads. The types and brands of feed received by farmers constantly changed following feed availability in the core company's warehouse. The types of broiler chicken feed were generally divided into 2 (two) kinds: feed in the starter phase and feed in the finisher phase [37,38]. The starter phase was when broiler chickens aged 1-21 days, while the finisher phase was when broiler chickens aged 22-35 days or up to the desired harvest age. Feed is vital in the livestock business. There are 3 (three) main pillars in livestock business, namely breeding, feeding, and management [39].

During the rearing period, broiler farmers received 133 sacks of feed from the core company, where 1 (one) sack of feed weighed 50 kg. Feed Supply received by farmers of as much as 6,650 kg showed that the debt of farmers to the core company was Rp 54,987,500. It showed that the plasma core partnership system also helped plasma farmers as partners of the core company in terms of providing business capital due to limited resources owned by the farmers [40–43]. The supply of broiler chicken feed by the core company to plasma farmers consists of 4 (four) types of feed from 2 (two) suppliers, namely the Sierad Company at 69.92% and the New Hope Company at 30.07%. The use of Sierad B 100 SPR feed type was 7.51%, Sierad AS 100 B was 37.59%, New Hope 811 B was 30.07%, and Sierad FB 101 was 67.66%. The use of broiler chicken feed types in the core plasma partnership system is quite varied, depending on the feed stock in the core company's warehouse, because the core company does not produce animal feed, but instead buys it from feed companies. This is one of the weaknesses of the plasma core partnership system in Indonesia, because the type of feed used is often not suitable for the type of broiler chickens raised by plasma farmers.

Supply of Drugs, Vaccines and Chemicals (OVK)

Drugs, vaccines, and chemicals (OVK) were supplied by the core company to plasma farmers 1 (one) time. Data on OVK transactions during the rearing of broiler chickens is presented in Table 3.

TABLE 3. Drugs, Vaccines, and Chemicals (OVK) Transaction Data During One Rearing Period for 2,000 Heads

No.	Date	Item Name	Quantity	Price/ Unit (Rp)	Nominal (Rp)
1.	10-06-2024	MBM Erydox 100 gr	2	37,268	74,536.00
2.	10-06-2024	Medion Heprovit 250 ml	2	139,271	278,542.00
3.	10-06-2024	MBM Issukur 100 gr	2	16,940	33,880.00
4.	10-06-2024	Medion Therapy 100 gr	1	52,151	52,151.00
5.	10-06-2024	AJS Chlorin 1 kg	1	101,423	101,423.00
					540,532.00

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

Table 3 shows that there were 5 types of OVK supplied by the core company to plasma farmers during the broiler rearing period. OVK supply received by farmers during the rearing of broiler chickens showed that the debt of farmers to the core company was Rp. 540,532.00. It showed that the plasma core partnership system also helped plasma farmers as partners of the core company in terms of providing business capital due to limited resources owned by the farmers [8,24,44–46].

Data on Broiler Chicken Sales

Harvesting broiler chickens was carried out after reaching the age of 34-35 days, for 2 (two) days, on December 17 and 18, 2024. Broiler chicken harvest in the plasma core partnership system was the responsibility of the core company. Data on broiler chicken sales are presented in Table 4.

TABLE 4. Data on Broiler Chicken Sales

No.	Date	Total (heads)	Amount (kg)	Average Weight (kg)	Average age (days)	Selling price (Rp/kg)	Nominal (Rp)
1.	13-07-2024	320	649.50	2.03	35	19,455.00	12,629,527.50
2.	13-07-2024	443	896.50	2.02	35	19,455.00	17,432,442.50
3.	13-07-2024	454	914.00	2.01	35	19,455.00	17,772,230.00
4.	13-07-2024	500	1,012.00	2.02	35	19,455.00	19,678,340.00
5.	13-07-2024	168	336.00	2.00	35	19,390.00	6,515,040.00
		1,885	3,808.00	2.02	35		74,028,080.00

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

The obligation of broiler chicken farmers with the plasma core partnership system was to pay off the debt of poultry production facilities to the core company. The debt included the capital cost of DOC supply of Rp. 16,000,000.00 (22.36 percent), the capital cost of feed supply of Rp. 54,987,500. 00 (76.87 percent), and the capital cost of drugs, vaccines, and chemicals (OVK) supply of Rp. 540,532. 00 (0.75 percent). Plasma farmers repaid the debts using broiler chicken meat produced during the rearing. Table 4 shows that broiler chicken sales reached Rp. 74,028,080.00. Chicken sales were made to trader collectors who have been working with the marketing of the core company; therefore trader collectors were part of the marketing chain of broiler chickens and are intermediary between the core company and market traders or consumers, so the core company must always establish good relations with trader collectors [19,47–50].

Farmer Performance

The broiler chicken rearing performance for 1 (one) period by plasma farmers is shown by the performance data in Table 5. According to this table, the performance of broiler chicken rearing by plasma farmers was poor. Several factors indicating poor performance were the high depletion rate of 7.01 percent and low IP value of 281.

TABLE 5. Farmer Performance

Performance Indicators of Farmers	Actual	Standard	Difference
Amount of harvest (heads)	1,885.00		
Amount of harvest (kg)	3,808.00		
average weight of broiler chicken (kg)	2.02		
Average age of broiler chicken (days)	35.00		
Depletion (percent)	5.75		
FCR	1.746	1.835	-0.089
IP	311.57		

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

The IP (Table 5) value indicated that the success indicator of the broiler chicken farming business was quite good because the IP value was within the range of 301-325. The depletion standard set by the core company based on partnership contract data was 3.05 percent. However, the depletion rate reached 5.75 percent, exceeding the maximum number set by the core company, so that farmers did not get a depletion bonus. High depletion could be caused by environmental factors in the cage of open-house cage type. Broiler chickens kept in open-house cages had a higher risk of depletion when compared to broiler chickens kept in close-house cages.

It was different from close-house cages, as close-house cages had a depletion level of only 1.28 percent. It was because the cage types and the cage floor type could influence the high and low depletion. In addition, the high depletion rate was caused by poor rearing management, weather changes, especially for open-house cages, biddy quality, genetics, and the emergence of disease outbreaks.

3.6 Plasma Farmer Income

The results of broiler rearing for 1 (one) period by plasma farmers were evaluated in the form of Recapitulation of Farmer Rearing Results (RHPP). The RHPP produced by farmers in the November–December 2021 rearing period is presented in Table 6.

TABLE 6. RHPP for 6.000 Heads for 34-35 Days of Rearing

Variable		Nominal (Rp)	Total (Rp)
A.	Profit/loss		
	Total sales of broiler chickens	74,028,080.00	
	Total debt (poultry production facilities)	71,528,032.00	
	Subtotal	2,500,048.00	2,500,048.00
B.	Bonus		
	FCR difference	190,400.00	190,400.00
	Subtotal	190,400.00	190,400.00
C.	Farmer income	subtotal A+B	2,690,448

Source : RHPP Document Number 27-02/1990-AM2/A2P/2024

Table 6 shows that the total debt of plasma farmers of broilers was Rp 71,528,032.00. The debt consisted of DOC supply (22.36 percent), feed supply during the rearing period (76.87 percent), and OVK supply (0.75 percent). The broiler farmer income with this partnership system was 3.76 percent of the total debt for poultry production facilities costs. This percentage showed that broiler farmers with the plasma core partnership system benefited from rearing broilers. Although with a fairly good achievement category, the farmers obtained FCR bonus of Rp 190,400.00 [14,37,38].

CONCLUSION

Broiler farming using the plasma core partnership system is a partnership system between 2 (two) parties who cooperate. The first party is a poultry company that acts as the core as well as the owner of capital (that suplies DOC, feed and drugs, vaccines, and chemicals/OVK) and the second party is farmers who act as the plasma as well as the farmers of broiler chickens. The broiler chicken farming business using a core plasma partnership system with a population of 2,000 heads costs Rp 71,528,032.00 with provisions for DOC costs of 22.36 percent, feed costs of 76.87 percent, and OVK costs of 0.75 percent. Chicken sales obtained amounted to Rp 74,028,080.00 with a harvest age of 35.00 days with an average weight of 2.02 kg. The number of chickens harvested was 1,885, meaning the depletion level was 5.75 percent. The FCR value is 1.746 with an IP value of 311.57. The overall performance evaluation of plasma breeders is in the quite good category. The overall income of plasma farmers is Rp 2,690,448.00 (after adding the FCR bonus because the FCR value is below the standard provisions of the core company). The recommended practical implication for stakeholders in the Indonesian livestock industry is that the core company strives to supply broiler chicken feed according to the type of broiler chicken used, sourced from the same company, with the aim of optimal broiler chicken production performance. Apart from that, it is necessary to evaluate the broiler chicken farming business using the plasma nucleus partnership system for various

population scales, such as micro scale (less than 5,000 birds), small scale (5,001-50,000 birds), medium scale (50,001-1,000,000 birds), and large scale (>1,000,000 heads) per production cycle.

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