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Economic analysis comparison between broiler chicken reared in closed house cage and its reared in open house cage

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Economic analysis comparison between broiler chicken reared in closed house cage and its reared in open house cage

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Abstract. Aim of the study was to compare economic analysis of broiler chicken was reared in closed house cage and broiler chicken was reared in open house cage. The study of closed house cage was conducted in Closed House cage owned by Faculty of Animal and agricultural sciences Diponegoro University which has 22,000 heads of broiler chicken this cage was given by Charoen Pokphand Indonesia Ltd, Operasionalized of this cage collaborated with Cemerlang Unggas Lestari Ltd, wherever the study of open house cage was conducted in farmer cage Gunungpati subdistrict, Semarang Regency. Parameters which observed were FCR, mortality rate, length rearing period, live final weight, IP, revenue, production cost, BEP and income. Broiler farmer in Gunungpati reared 5,000-15,000 heads of broiler on average. Broiler chicken reared in closed house cage had mortality rate was lower, live final weight was greater, FCR was lower and IP was greater compared with broiler chicken reared in open house cage. Economic analysis showed broiler chicken reared in closed house have revenue was greater, BEP was lower, cost of production was lower and income/bird was greater compared with broiler chicken reared in open house cage. Technically and economically broiler chicken reared in closed house cage more benefit than broiler chicken reared in open house cage.

1. Introduction

Broiler chicken rearing system influenced the health, economical efficiency and production efficiency of business [3]. Closed Housed cage is the one of broiler rearing system which more efficently compare with open house system. Some researches were done on poultry performance [10]. Rojano *et al.* [8] stated utilization of closed house cage would improve the performance of broiler because the temperature and humidity were controlled efficiently. Contract model is one of the solution to assurance the live broiler price [5]. Broiler chicken were raised in closed house cage more convenient compare wiyh its raised in open house chicken [13]. In closed house cage heat stress, temperature and humidity could controlled effectively, so broiler could live in convenient condition. This condition would improve the feed conversion ratio (FCR), improve the final live weight and reduce the mortality rate. The quality of feed would determine the broiler chicken rearing system [1]. Tongpool et al [12] stated improvement of environment performance would lead to improve broiler feed consumption. The good quality of feed would influence the quality of broiler chicken growth [7]. The research was compare the economic analysis of broiler chicken raised in closed house and broiler chicken raised in open house cage.

2. Materials and Methods

The survey method were done in this study. The survey for Closed House cage was done in Faculty of Animal and Agricultural Sciences, Diponegoro University. The survey for open house was done in broiler chicken farmer in Gunungpati subdistrict, Semarang Regency. The closed house cage owned by Faculty of Animal and Agricultural Sciences was given by Charoen Pokphand Indonesia, and already operasionalized since September 2017 with the cage capacity was 22,000 heads of broilers every periods. Every periods of broiler rearing is 31-35 days. During the research time, the temperature were maintenanced at 31.5°C.

4 (four) time periods rearing broiler data were utilized in this research in Closed House cage in 22,000 heads broiler and one year data for 5 time periods rearing data were used in open house cage. Descriptive analysis were used in this study. Mortality rate, average live weight, feed conversion ratio (FCR), length of rearing period and index performance (IP) were computed. Production coct, revenue, break event point and income was computed. Production coct, revenue, and income were computed using Soekartawi methods (2003) :

TC = TVC + TFC
TC = *Total Cost* (Rp)
TVC = *Total Variabel Cost* (Rp)
TFC = *Total Fixed Cost* (Rp)

As mathematically could be computed:

$\pi = TR - TC$

TR = Q x Pq
TR = (Pa.Qa) + FCR incentive + Mortalitas incentive + price incentive

Where
π = Income (IDR)
TR = Total revenue (IDR)
TC = Total cost (IDR)
Q = Total product (IDR)
Pq = Product price / kg (IDR)
Pa = Broiler price (IDR/kg)
Qa = Total broiler live weight (kg)
I. Mortalitas = Mortality incentive (IDR)
I. FCR = FCR incentive (IDR)
I. Price = price Incentive (IDR)
Berak even point was computed follow Mardiyanto formula (2009)

$$\text{Break Even Point (BEP)} = \frac{\text{Fix cost}}{\text{Price/kg} - \text{variable cost/kg}}$$

3. Results and Discussion

3.1. Broiler chicken performance

As shown as in Table 1, broiler chicken was reared in Closed house cage perform better than broiler chicken reared in open house cage. The mortality rate of broiler chicken raised in closed house (0.98%) was lower than mortality rate of its reared in open house cage (11.5%). The final weight of broiler chicken raised in closed house cage was heavier than final weight of broiler raised in open house chicken. Index performance (IP) of broiler raised in closed house cage was greater than IP of broiler chicken raised in open house cage. The results in agreement with study Majid *et al*. [5] which found that performance of broiler chicken raised in closed house cage performed better than broiler chicken raised in open house cage. In closed house cage because the condition was maintenanced in well condition so efficiently convert feed to be meat. In closed house, temperature was maintenanced at 31.5°C, and humidity was maintenanced at 60. The study also in agreement with Rojano *et al*. [8] that stated closed house cage gave good condition for broiler chicken during rearing period.

Table 1. Performance of broiler reared in closed house cage and open house cage

No	Items	Broiler chicken Reared in Closed House Cage	Broiler Chicken reared in Open House cage
1	Mortality rate (%)	0.98	11.5
2	Final Weight (kg)	1.86	1.7
3	Feed Conversion Ratio (FCR)	1.44	1.8
3	Length days of rearing (days)	31.5	35
4	Index Performance (IP)	413	350

3.2. Production cost

As shown in table 2, Production cost of broiler chicken was reared in closed house cage was greater than production cost of broiler reared in open house cage. Production cost per bird broiler chicken raised in closed house was IDR 27,303 was greater than production cost per bird broiler chicken raised in open house cage. The study in agreement with Majid *et al*. [4] which stated that closed house cage need more facility which lead to increased the production cost.

Table 2. Production cost of broiler reared in closed house cage and open house cage

Production cost	Closed House (22,000 heads broiler)	Open House (15,000 heads broiler)
Variable cost (IDR)		
DOC	119,900,000	90,000,000
Feed	437,550,000	218,000,000
Vaccine and medicine	12,673,000	8,000,000
Labor salary and incentif	9,600,000	7,800,000
Rice hust	7,600,000	7,200,000
Gas and electricity	9,400,000	7000,000
Total of variable cost	**596,687,000**	**338,000,000**
Fix Cost (IDR)		
Facility and cage depreciation	4.000.000	2,000,000
Total of Production cost	**600,687,000**	**340,000,000**
Production cost/bird	**27,303**	**25,612**

3.3. Economic Analysis

As shown in Table 3, broiler chicken was raised in closed house perform better than broiler chicken raised in open house. Revenue/bird broiler raised in closed house was IDR 31,958 was greater than broiler raised in open house. BEP of broiler chicken raised in closed house (11,127 heads) was lower than BEP of broiler (13,450) kept in open house. Income/bird of broiler kept in closed house was IDR 4,654. Income/bird of broiler kept in open house cage was IDR 2,909. This result indicate that income/bird of broiler chicken raised in closed house was greater than income/bird of broiler raised in open house cage.

Table 3. Economic analysis broiler kept in Closed House cage and open house cage

No	Items	Closed Housed cage (22,000 heads broiler)	Open House cage (15,000 heads broiler)
1.	Revenue (IDR)	703,087,000	383,647,500
2.	Revenue/bird (IDR)	31,958	28,900
3	Cost of Production (IDR)	600,687,000	340,000,000
4	Cost of production/bird (IDR)	27,303	25,612
5	BEP (heads)	11,127	13,450
6	Income (IDR)	102,400,000	43,647,500
7	Income/bird (IDR)	4,654	2,909

4. Conclusions

Based on the result of study, Broiler chicken reared in closed house cage performed better technic and economically than broiler chicken reared in open house cage. Mortal rate, FCR and IP of broiler reared in closed house cage better than its of open house cage, finally broiler chicken reared in closed house cage gave income/bird was greater than broiler chicken reared in open house cage.

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