

Analysis of the Cost of Maintaining Broiler Chickens with Herbal Feed

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ABSTRACT

The development of the broiler farming industry is currently facing many challenges such as high feed prices, management, and livestock diseases. Colibacillosis is a disease that is often found in the field so that it has an impact on the farmer's economy. Colibacillosis can cause growth disturbances, decrease in production, increase in the number of rejected chickens, decrease in carcass and egg quality, as well as chick quality (DOC) (Tabbu, 2000). The anticipatory measure is the administration of antibiotics, however their use has recently begun to be reduced due to the impact on chicken carcasses. This study aims to analyze the costs incurred for maintaining the health of livestock fed herbal feed and the cost efficiency used in raising broilers with herbal feed compared to conventional methods. The results showed that the application of herbal feed in broiler farms was efficient in saving maintenance costs

INTRODUCTION

The broiler industry is one of the livestock sectors that can be developed and has superior potential because it can be implemented on an industrial scale to a small scale. Until now, broiler farms are growing rapidly in accordance with the progress of global poultry to achieve optimal business efficiency targets. Business efficiency is very important so that the quality of poultry products can compete in the free market and efforts that must be made are feed substitution, product quality improvement, livestock productivity increase.

In this maintenance system, there are problems that become challenges that must be addressed immediately so that the supply of meat in sufficient quantities with good quality can be achieved. The first problem is the efficiency of broiler production which depends on the high price of broiler feed. The anticipation is the efficiency of feed use by providing high fat feed and increasing the feed conversion rate (FCR) by maximizing feed absorption by the digestive organs. The next problem is the demand for broiler meat which is low in fat such as cholesterol, but high in protein, and free of pathogenic microbes and free of antibiotics. Research states that the issue of food safety of livestock origin that is a public concern includes contamination of pathogenic microbes and antibiotic residues in meat as a side effect of giving antibiotics in feed which function as antibiotic growth promoters (AGP) (Wuryaningsih, 2005). The use of antibiotics as a feed additive is intended to stimulate growth by stimulating the formation of vitamin B complex by microbes (Chopra and Robert, 2001).

Antibiotics given to broiler livestock through feed and drinking water will cause residues in chicken meat as a result of antibiotics that are not secreted properly. The types of antibiotics that are often found in broiler farms are Bacitracin, kuramicin, higromicin, cholistin, kyamycin, spiramycin, tiamulin, virginiamycin, aviamycin, flavomycin and tetracycline. For this reason, the use of natural feed additives is an alternative to reduce the accumulation of residues from conventional feed additives.

Herbal concoctions have long been known by the people of Indonesia as traditional medicines because the tropics have considerable potential for developing herbal medicinal plants. A series of studies that have been conducted show that the use of herbal ingredients in liquid and powder form can inhibit gram-positive and gram-negative bacteria because the ingredients contain bioactive substances (Agustina, et al, 2009). The types of herbs that have the highest antioxidants are: turmeric, ginger, basil, garlic, and shallots (Ademoyegun et al, 2010). Herbal ingredients are expected to be valuable dietary constituents for promoting good health in veterinary public health. Curcuminoid compounds in turmeric have antibacterial properties by killing harmful substances and stimulating the walls of the gallbladder to secrete bile so that it can facilitate fat metabolism. Curcumin as a phenolic compound is able to

damage and penetrate bacterial cell walls and then precipitate microbial cell proteins (Mills and Bone 2000). Chattopadhyay et al (2004) reported that curcumin acts as a gastroprotectant and protects hepatocyte cells from compounds that can damage hepatocyte cells such as carbon tetrachloride and peroxide. The curcumin activity is expected to prevent inflammatory processes in the gastrointestinal tract and liver.

LITERATURE REVIEW

The development of the broiler farming industry is currently facing many challenges such as high feed prices, management, and livestock diseases. Colibacillosis is a disease that is often found in the field so that it has an impact on the farmer's economy. Colibacillosis can cause growth disturbances, decrease in production, increase in the number of rejected chickens, decrease in carcass and egg quality, as well as chick quality (DOC) (Tabbu, 2000). The anticipatory measure is the administration of antibiotics, however their use has recently begun to be reduced due to the impact on chicken carcasses.

Turmeric (*Curcuma domestica*) is a type of plant that can be found in Indonesia. Chattopadhyay et al. (2004) reported that turmeric contains protein, fat, minerals, carbohydrates, and water. Turmeric rhizome also contains essential oils, curcumin, resin, oleoresin, desmethoxy-curcumin, dammar, dang om (Khumaini et al. 2012). Curcumin was reported to stimulate bile secretion and act as a gastroprotectant (Chattopadhyay et al. 2004). Meanwhile, essential oils are reported to play a role in regulating the release of stomach acid. Regular secretion of bile and gastric acid affects the process of metabolizing nutrients in the digestive tract (Erniasih and Saraswati 2006). The benefits of curcumin can be antibacterial, immunomodulatory, and antioxidant.

Broiler chickens are technologically engineered chicken lines that have economic characteristics and fast growth as meat producers, low ration conversion, can be slaughtered at a young age, and produce quality soft fibrous meat (Bell and Weaver, 2002). Broiler chickens according to Gordon and Charles (2002) are modern hybrid strains of male and female breeds bred by special breeding companies. There are many types of broiler strains on the market, where in general the differences lie in the growth of the chickens, feed consumption, and feed conversion (Bell and Weaver, 2002). The characteristics of broiler chickens are that they have a soft skin and meat texture and the breastbone is a flexible cartilage. The condition of good broiler chickens is influenced by breeding, feed, and frequency (Ensminger, 1992).

METHODOLOGY

Time and Location of Research

This research was conducted in 2019 at the Pangkajene Islands State Agricultural Polytechnic Campus, Pangkep starting in July 2019 until November 2019.

Research design

This research was conducted in two stages. Stage 1 is maintenance then proceed to stage 2, namely data collection.

1. Stage 1

Maintenance of broiler chickens starts with 56 one-day-old chicks (DOC) divided into 8 plots, 7 individuals per plot. Cattle are reared for one harvest period, which is 21 days, by providing basal feed and additional herbal feed, namely turmeric.

2. Stage 2

The data collection stage was carried out during the research, namely data on all production costs, starting from preparation for maintenance, up to sales data collection.

Data Types and Sources

Data Type

The type of data used in this study is qualitative and quantitative, namely data obtained in the form of interviews and numbers (numeric).

Data source

Sources of data used in this study: 1) primary data, namely data obtained directly from the respondents. 2) secondary data, namely data obtained from other sources such as documentation data on broiler maintenance through the provision of additional turmeric feed.

Data collection technique

The data collection technique used in this study is observation. Observation was carried out by observing and collecting data directly to the research location for broiler chicken maintenance.

Methods and Analysis Tools

Business feasibility analysis is seen by using the R/C ratio approach. Ratio is a comparison between total income and production costs, using the following formula (Asmara, et al, 2011):

$$\frac{r}{c} \text{Ratio} = \frac{\text{Total Admissions}}{\text{Total production costs}} \dots\dots\dots (1)$$

- The R/C value shows whether a business is profitable or making a loss so that it can be seen whether a business is feasible or not.
- R/C value > 1, then the livestock business activities carried out can be said to be feasible because the business activities carried out can provide greater revenue than the expenses.

- The value of $R/C < 1$ means that the livestock business activities carried out can be said to be infeasible because the business activities carried out cannot provide income that is greater than the expenditure.
- The value of $R/C = 1$ means that the livestock business activities carried out can be said to provide neither profit nor loss (break-even) because the income received will be the same as the expenditure incurred.

Flow Diagram

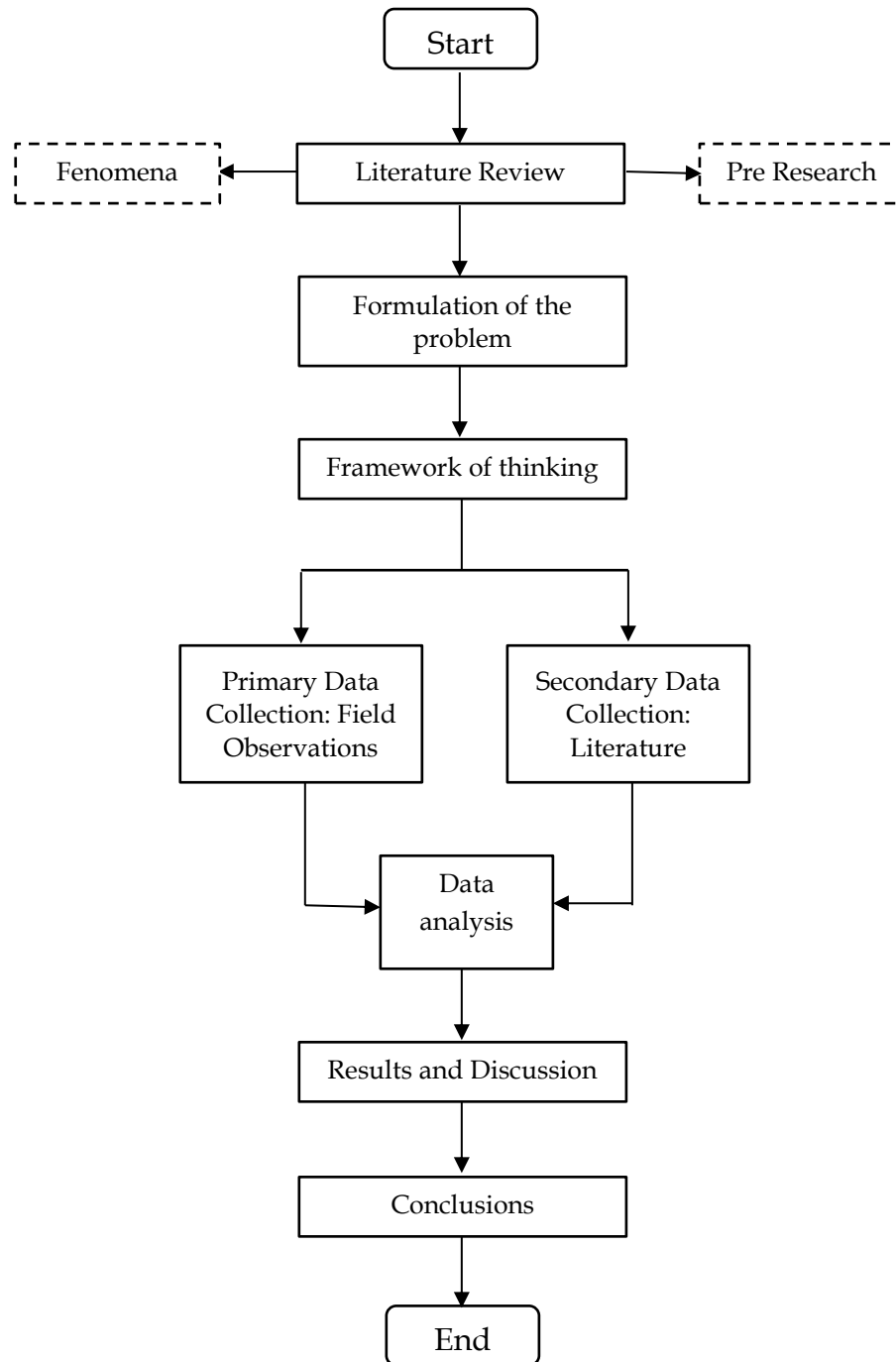


Figure 1. Flowchart

RESULTS AND DISCUSSION

Fixed Costs and Variable Costs

Fixed costs are costs that are not affected by the output produced. In this study, the costs included in this category are depreciation of production equipment by calculating the difference between the initial purchase price of the production equipment minus the final price of the production equipment and then dividing it by the economic life of the production equipment.

From Table 1 it can be seen that the amount of fixed costs during one maintenance period reaches Rp. 27,148, - per one cage plot. The cost is obtained from the results of the calculation of the production equipment used. During the rearing period, pens, feeders, drinking water containers are the most important production tools used during the rearing period until the harvest season, while gasolek, gas cylinders, and zinc flats are only used in the first two weeks when the cattle enter the starter period.

Table 1. Total Fixed Costs and Variable Costs Per One Pen Plot in One Period of Raising Broiler Livestock.

No	Cost type	Number of Costs (Rp)
1	Variable Cost	171.764
2	Fix Cost	27.148
3	Total Cost	198.912

Source: Primary Data Processed, 2019.

Variable costs are costs that are affected by the size of the production volume. The amount of variable costs on broiler farms for each cage plot in one production period can be seen in Table 1. The variable costs used in the broiler maintenance process include raw material costs, namely DOC broiler, raw turmeric, broiler starter feed, broiler grower feed, water, electricity, rice husk, LPG, and labor. The feed used consists of two types based on the composition and needs of the livestock growth period. This is distinguished by the protein content and the dose given considering the increase in body weight of livestock is directly proportional to the need for feed and water.

In this study, the costs of medicines were not included in the variable costs because they were substituted with raw turmeric. A study by Risa, et al (2014) indicated that feed mixed with lempuyang flour and turmeric was able to reduce the mortality rate of broilers. The content of essential oils in turmeric has bactericidal properties against bacteria belonging to the class *Bacillus caerus*, *Bacillus subtilis*, and *Bacillus megetenium* (Said, 2003).

Revenue Fee

Revenue is the result of multiplying the amount of broiler production produced by the selling price at the producer level. In the Pangkep area, the average price of one broiler (harvest period) reaches Rp 40.000,- per head. The amount of broiler meat received in one production period can be seen in Table 2.

Table 2. Revenue Costs Per Plot of Broiler Rearing Cages.

No	Plot to -	Revenue Fee (Rp)
1	1	252.000
2	2	288.000
3	3	288.000
4	4	251.600
5	5	256.000
6	6	288.000
7	7	287.200
8	8	292.800
Total Revenues		2.203.600

Source: Primary Data Processed, 2019.

The cage design used is divided into eight plots with 8 livestock. The distribution is done on the basis that competition in obtaining feed does not occur, so that equalization in obtaining feed per head of livestock. Table 2 shows the varying cost of Revenue due to differences in the weight of livestock per head in each plot. The selling price charged to consumers is based on the weight of the livestock meat, so the higher the weight, the higher the price obtained.

Revenue Fee

The feasibility of a livestock business can be seen through the Return per Cost Ratio (R/C ratio) approach, namely the average revenue of a farm divided by the total cost of production. A business is said to be feasible if the value of the R/C ratio is greater than one. Based on the results of the research that has been done, data regarding the value of the ratio on the cost of raising broiler chickens through herbal feed is presented in Table 3.

Table 3. The ratio of maintenance costs for broiler chickens through herbal feed.

Description	Mark
Total Revenue (TR) (Rp)	2.203.600
Total Cost of Production (Rp)	1.555.961
Ratio (R/C)	1,42

Source: Primary Data Processed, 2019.

The data in this study were analyzed using livestock business calculations and return cost ratio (RC) calculations that compare total revenue with total production costs. The results showed that the total cost (TC) obtained after 21 days of raising livestock was Rp.1,555,961 and the total revenue (TR) was Rp. 2,203,600. An RC value of 1.42 is obtained with an average RC ratio > 1, so that it can be interpreted for each additional Rp. 1 will increase revenue by Rp. 1.42.

CONCLUSION

The conclusion in this study is that the application of herbal feed on broiler farms is efficient to save maintenance costs.

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