ANALYSIS OF FEED MANAGEMENT EFFICIENCY IN CLOSED HOUSE SYSTEM BROILER FARM IN ROFAN FARM, BLITAR

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Abstract: Feed costs have a proportion of 70% in the livestock business. In addition, feed prices are volatile and tend to rise. This has an impact on farmers to carry out efficient feed management. Feed efficiency can be measured based on the feed conversion ratio (FCR). The lower the FCR ratio, the more efficient the feed used. In closed house farms, Rofan Farm has a fairly low FCR ratio. This is one of the backgrounds that needs to be studied for the cause of feed efficiency. This study aims to analyze the efficiency of feed management in closed house broiler farms in Rifan Farm, Blitar. The research used in this study uses a qualitative approach with a case study method. The data collection technique uses observation, interviews and documentation. Meanwhile, the data analysis technique uses descriptive statistics. The results of the study show that the average ratio of FCR is 1.45. One of the strategies is that farmers use turmeric as a feed additive in the form of flour mixed into feed. The administration of turmeric is given at the age of 1, 10, 11, 12, 19, 20, 21, 30, 31, and 32 days of chickens. The final body weight of a 36-day-old broiler reaches 2.5 kg.

INTRODUCTION

Broiler is one of the poultry commodities that has a high demand in the market (Y. Ye, Jiang, Ning, Lim, & Hu, 2023) (Queenan et al., 2022). This increase in demand encourages farmers to continue to increase production and efficiency in their livestock business. One of the important factors that affect the success of broiler chicken cultivation is feed management. Good feed management will have an impact on chicken growth, feed conversion ratio (FCR), and the quality of the meat produced (Rowe, Dawkins, & Gebhardt-Henrich, 2019). Feed costs approximately reach 70% of the operational costs of the livestock business. Therefore, farmers must be able to manage feed well (Lestariningsih, Sjofjan, & Sudjarwo, 2015a). One way that can be used by farmers is by adding feed additives (Lestariningsih, Sjofjan, & Sudjarwo,

2015b). Broilers can be kept in open cages and closed houses. The closed house system has become a popular choice in broiler chicken farming because it is able to provide better control over the cage environment, so it can increase productivity compared to open cages (Fattah, Faridah, Amalia, & Khaeruddin, 2023) (Mastuti et al., 2023). However, to achieve optimal efficiency, proper management is required, including in terms of feed management (Mandiling, Rozi, & Wiryawan, 2023). Rofan Farm, as one of the broiler farms in Blitar, has the potential to improve its production efficiency through the optimization of feed management. In Ropan Farm in closed house cages, feed additives in the form of turmeric are used to increase feed efficiency. This is because the curcumin compound in turmeric can maintain the balance of microflora in the intestines (Leyva-Diaz et al., 2021). The resulting impact is that the broiler's intestinal health becomes healthier and can do better digestion and absorption (Ruan et al., 2022).

Previous research has been done on feed management in broiler chickens. Several studies focus on the influence of feed type, feeding rate, and feeding time on chicken production performance. However, further research is still needed to identify specific factors that affect the efficiency of feed management in closed-house systems, especially in the Blitar area. This study focuses on the analysis of feed management efficiency in closed-house cages. This farmer was chosen because the breeder uses turmeric feed additives. Turmeric is one of the phytobiotics that can be used as a feed additive as an alternative to antibiotics, which has been banned at this time. The state of the art of this study is to combine knowledge of broiler chicken feed management with the specific characteristics of the closed house system. In addition, this study also considers local factors such as the quality of feed available in the Blitar area and the genetic characteristics of broiler chickens raised at Rofan Farm. The use of feed additives in closed houses is one of the interesting things to study. The use of turmeric as a feed additive aims to increase feed efficiency. This is under research that states that turmeric has curcumin compounds that have the potential to be antibacterial and can increase broiler body weight growth (Lee et al., 2013).

The novelty of this study lies in the application of a comprehensive analysis of feed management at Rofan Farm. This study will not only measure the efficiency of feed use but will also identify feed additives used in broilers to improve this efficiency. The results of this study are expected to provide specific recommendations to improve feed management efficiency at Rofan Farm and can be used as a reference for other broiler farmers. The urgency of this research is to contribute to the development of more efficient and sustainable broiler

chicken farms. By improving the efficiency of feed use, farmers can reduce production costs, increase profits, and preserve the environment. In addition, the results of this study can also be the basis for the development of broiler chicken farming policies and programs in the Blitar region.

RESEARCH METHODS

This research has been conducted from June 24, 2024 to August 2, 2024 at Rofan Farm in Wates Village, Wates District, Blitar Regency. This study uses a qualitative approach with a case study method (Lestariningsih, Zami, Syarifudin, Murtadzo, & Hidayatullah, 2024). The data collection technique uses observation, interviews, and documentation. The data that has been collected consists of the amount of broiler feed consumption for 36 days, broiler body weight from 1 to 36 days of age, FCR broiler for 36 days and the use of turmeric as a feed additive given to broilers in closed houses. In addition, secondary data has been obtained from farmer recording data. Observation was carried out directly by observing broiler feed management for 36 days. Meanwhile, the interview was conducted by giving questions openly to the farmers consisting of farm owners and employees. In addition, documentation is carried out in the form of photos of the results of research activities. Data analysis techniques using descriptive statistics.

RESULTS AND DISCUSSION

Use of Feed and Feed Additives in Closed House Cage Rofan Farm Blitar

Based on the results of observations and interviews, it is known that the feed given to broilers in the closed house cage of Rofan Rafm, Blitar Regency is finished feed with feed additives in the form of turmeric (Figure 1). Broiler feed is divided into 2 phases, namely starter and finisher. The feed given to broilers has been adjusted to the nutritional needs of each broiler in each phase of its maintenance. The protein requirement in the starter phase is 21 – 24% while in the finisher phase it is 18 – 20%. Related research states that the right nutritional composition of feed is the key to producing optimal productivity and quality of chicken meat. By understanding the nutritional needs of chickens and adapting them to existing environmental and management conditions, farmers can achieve better results (Choi, Kong, Bowker, Zhuang, & Kim, 2023).

Figure 1. Turmeric Used As a Feed Additive Broiler

Basal feed given to broilers is added to feed additives periodically. Additive administration is given at the age of 1, 10, 11, 12, 19, 20, 21, 30, 31, and 32 days when feed changes occur. At the age of 10, 11, and 12 days feed additives are added to drinking water. Meanwhile, at the age of 19, 20, 21, 30, 31, and 32 days, they are given into feed. The feed additive provided consists of 3 kg of turmeric, 2 kg of brown sugar, and dissolved in 200 liters of water. At the age of 1 day, sugar water is given to Day Old Chick (DOC). It aims to help DOC cope with stress, provide energy, prevent dehydration, and increase appetite, so that the growth and development of DOC is optimal (Wu et al., 2020). DOC experiences significant stress during the process of hatching, transporting, and placing in a new cage. This stress can lead to decreased immunity and slow growth. The sugar in the water provides fast energy that helps DOC cope with stress and speed up recovery. Sugar is a source of energy that is easily digested and absorbed by the body. After a long journey and a grueling hatching process, DOC needed additional energy to adapt to its new environment. Sugar water provides the fast energy needed for basic metabolic activity and early growth (Chang et al., 2022). During the transport process, DOC can become dehydrated. Sugar water helps restore lost body fluids and prevents more severe dehydration (Zhao et al., 2023). The sweetness of sugar water can stimulate DOC's appetite so that they start eating starter feed faster. The sugar water is mixed with turmeric. Turmeric mixed with other ingredients has a more optimal potential in maintaining the balance of microflora in the broiler intestine (Astuti & Cahyantari, 2020).

At the age of 10, 11, 12, 19, 20, 21, 30, 31, and 32 days, turmeric has begun to be added to broilers. The turmeric is given in powder form. The turmeric comes from fresh turmeric that has been cleaned and then dried and mashed into powder. The purpose of providing feed additives is to increase feed efficiency. This is because turmeric contains curcumin which has the potential to be antibacterial. Several studies explain that turmeric can help maintain the balance of microflora in the intestines so that it can help the digestion process and absorption more optimally. In relevant studies, it was proposed that the addition of TF-36 standard turmeric extract of 1% in broiler feed can provide significant benefits to the growth and efficiency of chicken production. Turmeric extract in this case is suspected to contain bioactive compounds such as curcumin that have various properties, including antioxidant and anti-inflammatory properties, which can support the health and growth of chickens. In addition, giving turmeric can also reduce FCR by 10%. FCR is a measure of feed use efficiency. The lower the FCR value, the more efficient the chicken will be in converting feed into meat. A 10% decrease in FCR showed that chickens fed turmeric extract were able to produce more meat with less feed than the control group. This means turmeric extract helps improve feed use efficiency (Johannah, Joseph, Maliakel, & Krishnakumar, 2018).

Evaluation of the Amount of Broiler Feed Intake in the Closed House Cage of Rofan Farm Blitar

Based on the observation results, it is known that broilers are kept for 36 days. Broiler feed intake during one maintenance period is an average of 3,532 grams/head. The feeding method is carried out by ad libitum and restriction. The feeding in the starter and finisher phases in the broiler is as follows:

Figure 2. Feeding Broilers

Based on the results of observations and interviews, it is known that feed intake from 1-33 days old is given ad libitum. Meanwhile, starting from the age of 34 – 36 days, feed is

restricted or uses the restriction method. This feed restriction is carried out to reduce feed intake closer to harvest time. This aims to use fat as an energy reserve in the broiler body so that it is used optimally. This is in accordance with the results of related studies which state that feed restriction means reducing the amount of feed given to chickens compared to ad libitum (all-you-can-eat) feeding. By reducing feed intake, the chicken's body will be forced to use stored energy reserves, especially fat, as an energy source. This triggers an increase in lipid metabolism, where body fat is broken down into fatty acids and glycerol to produce energy. As a result, the accumulation of fat on the chicken's body will be reduced, especially in unwanted parts such as belly fat. This reduction in body fat not only improves the quality of carcass (the body part of a chicken that can be consumed) by reducing the percentage of fat, but it can also improve the quality of meat. Meat with a lower fat content is generally preferred by consumers because it is healthier and has a better texture. In addition, by reducing feed consumption, farmers can save on production costs. However, it should be noted that feed restrictions must be carried out carefully and measurably so as not to interfere with the growth of chickens and their health (J. Ye et al., 2022).

Evaluation of Broiler Body Weight Increase in Closed House Rofan Farm Blitar

Based on the observation results, it is known that there is an increase in broiler body weight for 36 days with the following data.

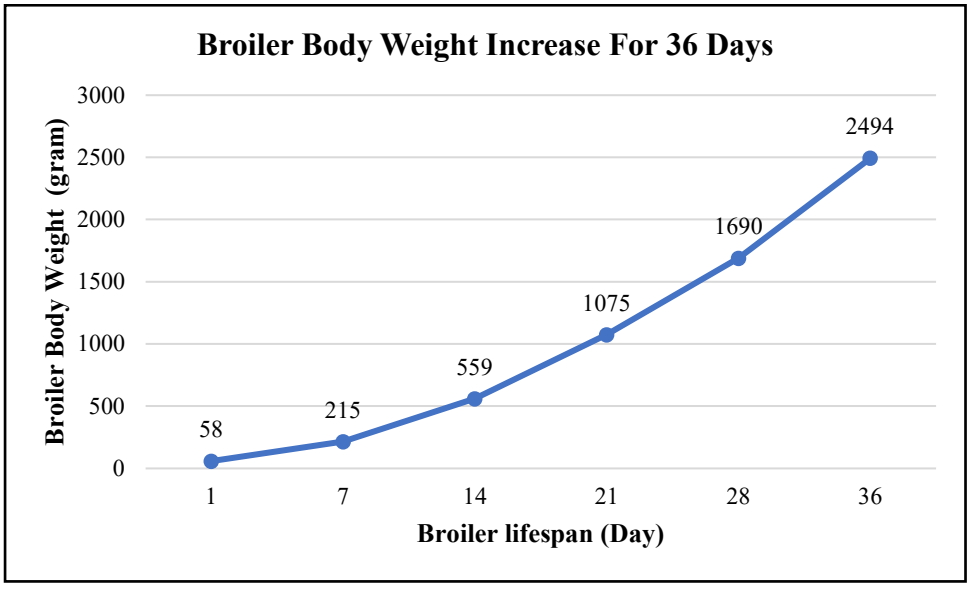

Figure 3. Broiler Body Weight Increase For 36 Days

Based on the picture above, it can be seen if the weight of the broiler body has increased significantly. The weight of DOC was 58 grams and maintained for 36 days to 2,494 grams. The increase in broiler body weight is caused by the feed given and added with saffron feed

additives can function optimally in the broiler body. The results of a similar study suggest that the addition of turmeric as a feed additive in the amount of 0.02% to 0.08% of the feed results in a dosing of 0.06% resulting in high effectiveness in increasing the weight of the broiler body. The active compound in turmeric that has anti-inflammatory and antioxidant properties. This can help improve gut health, improve nutrient absorption, and reduce stress in chickens. Some studies show that curcumin can increase broilers' appetite, so broilers consume more feed and grow faster. Curcumin can help improve feed efficiency, meaning that chickens can grow larger by consuming less amount of feed (Utami, Dwiani, & Agus, 2019).

Similar research also explains that curcumin has great potential as a natural feed additive to improve the growth and health of poultry (Li et al., 2022). Curcumin is a yellow-colored compound that gives turmeric its distinctive color. It is this compound that is thought to be responsible for most of the health benefits associated with turmeric. Studies have shown that the addition of curcumin to poultry feed can increase the growth rate. Chickens fed curcumin-containing feed tended to have a higher body weight at the same time compared to the control group. This indicates that curcumin can stimulate metabolism and improve the efficiency of nutrient use. Curcumin has powerful antioxidant and anti-inflammatory properties. These properties help to improve the immune system of poultry, so they become more resistant to various types of diseases. Curcumin can also help reduce inflammation that often occurs due to infection or stress. The term "natural growth promoter" refers to substances that can promote growth without the use of antibiotics or synthetic growth hormones. The use of antibiotics as growth promoters has been restricted in many countries due to concerns about antibiotic resistance. Curcumin offers a safer and more natural alternative (Sureshbabu et al., 2023).

Evaluation of the Broiler FCR Ratio in The Closed House of Rofan Farm Blitar

Based on the results of observations and interviews, it is known that the average FCR of broilers for 36 days is 1.45. Feed Conversion Ratio (FCR) is a measure of efficiency that shows how efficient a broiler chicken is in converting the feed it consumes into meat. This FCR figure is obtained by comparing the amount of feed consumed with the increase in chicken body weight. The lower the FCR value, the more efficient the chicken will be in converting feed into meat. An FCR value of 1.45 means that to produce 1 kg of chicken meat, 1.45 kg of feed is needed. In other words, out of every 100 kg of feed given, only about 69 kg is successfully converted into meat, while the rest is used for the body's metabolic activity, feather growth, and so on. This value shows that the feed conversion efficiency in the chicken can still be improved.

Some factors that can affect the FCR value include: feed quality, chicken genetics, environmental conditions, maintenance management, and the presence of disease. High-quality, balanced feed will help improve feed conversion efficiency. In addition, chicken genetics also plays an important role. Chickens with good genetics tend to have lower FCR. Comfortable environmental conditions and good maintenance management will also support the growth of chickens and improve the efficiency of feed use.

The results of the study suggest that turmeric has curcumin compounds that can be used to increase broiler growth. Turmeric can be given in direct form or by nanoparticle technology. The nanoparticle form appears to be more effective because it can improve the absorption and bioavailability of curcumin in the body of chickens. The results of this study open up opportunities for the development of curcumin-based feed supplements that are more effective and efficient. The effects of this weight gain were more pronounced at doses of 50 and 100 mg/kg, compared to lower doses. This suggests that there is a dose-response relationship, where the higher the dose given, the greater the effect on growth (Badran, Basuony, Elsayed, & Moneim, 2020). Several other studies have shown that the application of turmeric as a feed additive broiler can reduce feed conversion. Broilers fed with acidified turmeric can convert feed into meat more efficiently. In other words, the broiler can grow larger by consuming a smaller amount of feed compared to chickens that are given other treatments. By increasing FCR, farmers can reduce feed production costs and increase profits (Sugiharto et al., 2020) and improve feed efficiency (Kim, Nho, & Kim, 2020).

CONCLUSIONS AND RECOMMENDATION

The results of the study show that the average ratio of FCR is 1.45. One of the strategies is that farmers use turmeric as a feed additive in the form of flour mixed into feed. The administration of turmeric is given at the age of 1, 10, 11, 12, 19, 20, 21, 30, 31, and 32 days of chickens. The final body weight of a 36-day-old broiler reached 2,494 grams or 2.5 kg. The suggestion from the results of this study is that turmeric can be used as a feed additive to improve the appearance of broiler production. However, it is necessary to pay attention to the dosage given to livestock and the quality of turmeric used as a feed additive for broilers.

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