

Substitution of Concentrate with Corn Waste on the Productivity of Layer Roosters

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ABSTRACT

This study aims to determine the substitution of concentrate with corn waste for the productivity of roosters. The material used in this study was male chickens aged 30 days with an average body weight of ± 500 g. The research method used was a field experiment using a completely randomized design (CRD). The treatments in this study were T0 100% concentrate, T1 90% concentrate and 10% corn waste, T2 80% concentrate and 20% corn waste. Each treatment was repeated five times. The variables in this study were consumption, body weight gain (PBB) and feed conversion ratio. The data obtained were analyzed using analysis of variance. If there is a difference between treatments, it is continued with the smallest significant difference test. The results of the analysis showed that there was a very significant effect ($P < 0.01$) on feed consumption, body weight gain and feed conversion. The highest feed consumption value was achieved in treatment T2 (52.99 g/head/day), the highest PBB in T2 (29.69 grams/head/day) and the lowest FCR in treatment T2 (1.67). Based on the results of the study, it was concluded that 20% corn pulp substitution gave the best product value for roosters.

Keywords: layer rooster, substitution, corn waste, production.

1. INTRODUCTION

The livestock sector is one of the pillars of national development related to the fulfillment of community animal protein. The development of the livestock business in Indonesia still has good prospects because the consumption of animal protein is still small and has the potential to increase along with the increase in population. According to national standards, adult protein consumption per day per capita is 55 g consisting of 80% vegetable protein and 20% animal protein. Currently, the demand for chicken meat is increasing along with the increasing rate of population growth, increasing population income, and people's awareness of the importance of animal protein. In addition to broilers, there is another type of broiler developed in Indonesia, namely layer chickens. Laying hens are female breeds that have been developed for eggs only.

The development of animal husbandry that is increasingly advanced encourages scientists to compete to create innovations in the world of animal husbandry. One of the innovations applied in animal husbandry is an effort to increase livestock productivity. Increased productivity of livestock cannot run properly without the provision of feed that has a balanced nutritional content. The cost of feed is the largest proportion of the cost of livestock production. One effort that can be made to reduce production costs is to use local feed ingredients that have high nutritional content [1].

The high price of feed has resulted in high livestock production costs, especially poultry, for this reason, efforts are needed to make the use of existing feed more effective and efficient. Therefore, efforts need to be made to obtain relatively inexpensive types of feed that can increase productivity and are economically profitable [2]. One of the efforts to reduce feed costs is to utilize corn dregs which can be used as feed ingredients for stud.

Corn is one of the main food crops after rice, which is very useful for human and livestock life because almost all parts of this plant can be utilized. The government is trying hard to expand maize cultivation to increase productivity through the Gema Palagung program [3]. Corn is the main source of energy in mixtures for broilers and is used as an energy source in concentrated feed for non-ruminant livestock such as pigs in America [4].

Corn dregs contain a high source of energy so it is good for livestock weight gain. Corn crop waste has the potential to be used as animal feed [5]. One of the wastes from corn plants is corn dregs. The chemical content of corn dregs is: BK 87.27%; 1.38% ash; crude protein 13.22%; crude fat 5.8%; and 2.92% crude fiber.

2. MATERIALS AND METHODS

The material in this study was 30 layer roosters aged 30 days with an average weight of 500 g. The method used is a field experiment using a completely randomized design (CRD) with five replications. The research treatments include:

- P0 : Control feed (100% concentrate)
 - P1 : Concentrate 90% + Corn Dregs 10%
 - P2 : Concentrate 80% + Corn Dregs 20%
- The variables observed were:

Feed consumption = feed 30th day – feed 1st day [19]
 body weight gain = body weight 30th day – body weight 1st day [20]
 feed conversion = feed consumption: body weight [21]

The research data were analyzed by analysis of variance [22].

3. RESULTS AND DISCUSSION

Based on the results of this study, it was shown that the substitution of corn dregs had a very significant effect ($P < 0.01$) on feed consumption, body weight gain and feed conversion for layer roosters.

3.1 Feed Consumption

Feed consumption is the amount of feed consumed by chickens or poultry in a certain period of time, for example, daily feed consumption is calculated in g/head/day [6].

Based on the results of the variance, it showed that the substitution of concentrate with corn dregs had a very significant effect ($P < 0.01$) on the consumption of layer roosters. The highest average feed consumption was at T2 (80% concentrate and 20% corn dregs) with a value of 52.99 grams/head/day and the lowest was at T0 (concentrate) reaching 41.69 g/head/day.

T2 gave the highest feed consumption value because the palatability of the ration in treatment 2 was better than the other treatments. The ratio of corn dregs in the T2 treatment was the highest, worth 20%, where corn dregs were classified as a carbohydrate source feed material that was high in glucose, so it had high palatability. The factors that influence feed consumption in poultry are crude fiber content in the feed, feed quality level, and palatability or taste of feed [7]. There is a relationship between digestibility and feed consumption. The more feed ingredients are digested, the more space is available for additional food [8].

Consumption is calculated as the amount of feed consumed by poultry. Feed consumption is influenced by factors such as body size, activity (males are more active than females), temperature, quality, and quantity of feed given. Feed consumption is influenced by several factors, namely body size, activity, temperature, quality and quantity of feed given [9]. Good feed is feed that has a low price and good quality which must have a balance between protein, energy, vitamins, minerals and water [10]. In raising chickens, it is necessary to pay attention to, among others, the provision of a balanced feed and the appropriate temperature of the cage. Normal body temperature in poultry ranges from 40.5–41.5°C [11].

3.2 Body Weight Gains

Body weight gain is the difference between the final weight (harvest) and the initial body weight at a certain time. The growth curve of livestock is very dependent on the feed given, if the feed contains high nutrients, the livestock can reach a certain body weight at a younger age.

Based on the results of variance showed that the substitution of corn pulp in the concentrate gave a very significant effect ($P < 0.01$) on the increase in body weight of male hens. Based on the calculation results,

Table 1. Feed consumption of layer rooster.

Treatment	Feed consumption (g/bird/day)
T0	41.69±0.65 ^a
T1	43.96±0.67 ^b
T2	52.99±0.83 ^c

Note: ^{a-c} Different notations in the same column indicate a very significant difference ($P < 0.01$).

Table 2. Body Weight Gain

Treatment	Body weight gain (g/bird/day)
T0	22.16±0.63 ^a
T1	26.30±0.64 ^b
T2	29.69±1.09 ^c

Note: ^{a-c} Different notations in the same column indicate a very significant difference (P<0.01)

Table 3. Feed Conversion Ratio of Layer Roaster

Treatment	FCR
T0	1.88 ± 0.02 ^b
T1	1.67 ± 0.05 ^a
T2	2.08 ±0.06 ^c

Note: ^{a-c} Different notations in the same column indicate a very significant difference (P < 0.01)

the highest average body weight gain was at T2 (80% concentrate and 20% corn dregs) with a value of 29.69 g/head/day and the lowest was at T0 (concentrate) reaching 22.16 g/head/day.

T2 treatment gave the highest value because the feed consumed by T2 was quite a lot of 29.69 g/head/day. The amount of feed consumed determines the amount of body weight gain [12]. The growth speed of an animal is influenced by several factors, namely nation, gender, age, food, and environmental conditions [13].

T0 gives a low body weight gain value, the lower the feed consumption, the body weight gain also decreases. The growth speed is the result of the interaction between genetic and environmental factors [14]. The average body weight of 244.0 g in broiler chickens reared for six weeks [15].

3.3 Feed Conversion Ratio (FCR)

Feed Conversion Ratio (FCR) or ration conversion is a reference of the efficiency level of the ration consumed during maintenance. The ration conversion is the ratio between the amount of feed consumed and the body weight gain produced over a certain period of time. The FCR ratio is used to measure livestock productivity, the higher the FCR, the more rations needed to increase livestock body weight per unit weight [16].

The results showed that the substitution of corn pulp in concentrate had a very significant effect on feed conversion (P < 0.01). The lowest feed conversion ratio (FCR) value was found in T1 which was 1.67 and the average conversion value at P0 was 1.88. The highest feed conversion value was at T2, which was 2.08. The high and low value of feed conversion is due to the larger or smaller difference in the ratio of feed consumption and body weight gain.

Each treatment had a significant effect on FCR because the level of feed conversion was influenced by the ratio of feed consumption and body weight gain. From the FCR value above, it can be concluded that the substitution of corn dregs in concentrate results in a

poor Feed Conversion Ratio (FCR) value, this is because the higher the FCR value, the poorer the quality of the feed provided. The higher the substitution of corn dregs in the concentrate, the higher the feed conversion value. The minimum and maximum feed conversion values for male chickens are 1.79 and 3.42 [17]. Feed conversion value is influenced by several factors including genetic factors, type of feed used, feed additive used in feed, maintenance management and environmental temperature [18]. The amount of ration used will affect the calculation of feed conversion or Feed Conversion Ratio [9].

4. CONCLUSION

Based on the results of the study, it can be concluded that the substitution of corn pulp as much as 20% gave the best value on the productivity of stud chickens and gave the best value for consumption and body weight gain of stud chickens.

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