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Effect of Giving Turmeric Flour in Ration on The Performance of Broiler Chickens in The Starter Phase

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Abstract: This study aims to determine the effect of the administration of turmeric meal in rations on broilers in the starter phase. This research was conducted on a Ngawi Regency, East Java broiler farm. The search time lasted 2 weeks. Penelitian dirancang dengan Rancangan Acak Lengkap (RAL) pola searah. The study was designed using a RAL unidirectional model. The treatment applied was the administration of turmeric meal in broiler chicken rations with three types of doses, including P0: Without the use of turmeric meal (100% Feed BR-11 / control), P1: Turmeric meal 1% + BR 11 99%, P2: turmeric meal 2% + BR 11 98%. The results of the digestibility study were observed from three variables: ration consumption, daily body weight gain, and ration conversion. The results showed a significant difference in mean ($P<0.05$) in ration consumption, a significant difference ($P<0.05$) in body weight gain, and a significant difference ($P<0.05$) in ration conversion. The study concluded that adding turmeric meal to the broiler feed ration in the start-up phase had a real effect on feed consumption, body weight gain and ration conversion.

Keywords: *Broiler Chicken; Body Weight Gain; Feed Consumption; Feed Conversion; Turmeric Powder.*

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Introduction

Broilers, a type of chicken known for their rapid growth and meat production, play an essential role in providing a cost-effective source of animal protein. Their ability to reach harvestable size in 4-5 weeks and produce tender meat highly favored by the community underscores the importance of broilers in meeting domestic nutritional and meat needs. Therefore, to ensure optimal production, these chickens require careful care and maintenance (Nuryati, 2019).

The success of broiler production is expressed in broiler Performance or appearance, which can be measured through mortality, feed consumption, final body weight, feed conversion ratio (FCR), and performance index (IP). The influencing factors are seed, feed, and management to achieve optimal broiler Performance. The management factor itself is primarily determined by feed management. In intensive maintenance, feed plays an essential role in determining the success of broiler farming (Syah et al., 2023).

Adequate feed in quantity and quality is expected to increase broiler productivity. For broilers to have good productivity, they must have the right amount of ration, balanced and efficient. Several types of non-nutrient feed ingredients are often used as a mixture, such as turmeric. According to (Rohmah, 2024a), in animal husbandry, turmeric has not been used optimally even though the compounds contained in turmeric (curcumin and essential oils) have a role as antioxidants, antitumor, anticancer, antimicrobial, and antiracism. Giving turmeric flour in drinking water can increase feed consumption in broiler chickens. The addition of feed in the form of turmeric has several good benefits for broiler chickens (Kasse et al., 2021).

The findings of this research could potentially provide broiler chicken farmers with valuable insights into how they can improve their broiler production practices. Giving turmeric as an addition to the ration in broilers can help facilitate the Performance of the digestive system so that it is more efficient in food absorption. Sulistyoningsih et al. (2017) stated that adding turmeric flour also increases endurance in livestock. Based on this phenomenon, the author is interested in researching the effect of adding turmeric flour on ration consumption, body weight gain, and ration conversion.

Materials and Methods

Time and Place of Research. This research was conducted at a broiler farm in Ngawi Regency, East Java. Research time lasted for 2 weeks.

Tools and Materials. The tools used in this study are: 1) There were 15 research cages, each measuring 1 x 0.65 m2. The cages were made of bamboo. Each plot was given a 5 watt LED lighting lamp. 2) Feeding and drinking containers. The feeders used had a capacity of 5 kg with a diameter of 40 cm, and could accommodate 10 chickens together. The drinker used is an automatic nipple drinker. 3) Digital scales with a capacity of 10 kg with an accuracy of 5 g. 4) Digital thermo-hygrometer. The materials used are: 1) Lohman strain broiler DOC produced by PT Japfa Comfeed Indonesia Tbk, mixed sex male and female (unsex) as many as 90 birds. 2) Broiler starter and finisher rations as control rations from commercial rations produced by PT. Charoen Pokphand Indonesia (BR-11). 3) Turmeric flour. 4) Multivitamins.

Experiment Design. The study was designed with a completely randomized design (CRD) unidirectional pattern. The treatment applied was the provision of turmeric flour in broiler rations with 3 kinds of doses, including: P0 : 100% BR 11 feed + 0% turmeric flour (control); P1 : Feed BR 11 99% + 1% Turmeric Flour; P2 : Feed BR 11 98% + 2% Turmeric Flour. Each treatment was replicated 5 times. Each replication used 1 cage plot filled with 6 chickens.

Research Procedure. The research procedure was as follows:

1. Preparation of turmeric flour: After being taken, turmeric flour was dried for two days in the sun. Then, turmeric flour is ground and ready to be mixed with broiler rations that will be given to chickens.
2. Cage and Chicken Preparation Stage: Cages are prepared prior to the arrival of the DOC. Cage plots, feeders, drinkers, availability of rations, turmeric flour, and lights (brooder) in each plot are counted. When the DOCs arrived, the chickens were randomly distributed throughout the cages. For one week, chickens were then fed broiler rations and drinking water.
3. Ration Adaptation Stage: This stage lasts for one week, starting when the chickens are 0 weeks old. At this stage, chickens are given the treatment ration, but no measurements have been taken for the research variables. The purpose of this adaptation stage is so that changes in the ration given to chickens do not affect the results of the study.
4. Measurement and Collection Stage, Research variables were measured once every week for two weeks. Measurements began when the chickens were one week old or after adaptation of the treatment ration for one week. Measurements were made using experimental units, namely each cage plot.

Data Analysis. Data on observational variables that have been calculated on each cage plot, starting from P0.1, P0.2, and so on up to P2.5, are then tabulated and inputted and analyzed using Analysis of Variance One-way Pattern (ANOVA one-way) SPSS software.

Results and Discussion

A. Consumption Ratio

The results of the analysis of feed consumption in starter phase broilers fed with turmeric flour in the complete ration can be seen in table 1 below:

Table 1. Results of feed consumption (g/head) in broiler chickens aged 7-21 days in the starter phase fed with turmeric flour in rations with different levels

Replication	Treatment		
	P0	**P1**	**P2**
1	545,33	548,67	552,83
2	538,67	544,50	554,50
3	545,33	547,83	552,83
4	544,50	522,00	551,17
5	549,50	552,83	547,83
Average	**544,66[a]**	**549,16 [ab]**	**551,83[b]**

Note [ab] In the row of the mean shows a significant difference (P <0.05)

Based on the analysis of variance, turmeric flour in the ration had a significant effect on feed consumption (P <0.05). The average feed consumption rate of broiler starter chickens is P0: 544.66 g/head, P1: 549.16 g/head, and P2: 551.83 g/head. In all treatments, there was a continuous increase in feed consumption, this could occur due to the quality of feed given. According to Razak et al. (2016), feed quality, body weight, and age are some of the factors that can affect feed consumption. Curcumin in turmeric can increase appetite, and essential oils can accelerate gastric emptying, increasing ration consumption (Nurhayati et al., 2015).

B. Body Weight Gain

The results of the analysis of daily body weight gain in starter phase broilers fed with turmeric flour in the complete ration can be seen in table 2 below:

Taable 2. Results of body weight gain (g/head) in broiler chickens aged 7-21 days in the starter phase fed with turmeric flour in the ration with different levels

Replication	Treatment		
	P0	**P1**	**P2**
1	680,00	722,50	760,00
2	711,67	710,84	792,50
3	610,00	784,17	701,67
4	630,00	796,67	758,33
5	622,50	770,00	787,50
Average	**650,83[a]**	**756,83 [b]**	**760,00[b]**

Note [ab] In the row of the mean shows a significant difference (P <0.05)

Our analysis of variance reveals a significant impact of turmeric flour in the ratio of daily body weight gain (P <0.05). Notably, the feed consumption rate of broiler starter chickens is P0: 650.83 g/head, P1: 756.83 g/head, and P2: 760.00 g/head, indicating the potential of turmeric flour to enhance body weight gain.

The study's significant body weight gain occurred in treatment P0 (control) and treatment P1 (1% turmeric flour) due to the average consumption of different rations, resulting in another weight gain. Growth rate and final weight in broilers are primarily determined by ration consumption because body weight and composition are the accumulation of rations consumed by livestock. This is supported by Situmorang et al. (2013), who state that ration consumption affects body weight gain because body weight gain comes from synthetic protein. Anggitasari et al. (2016) added that the growth of broiler chickens is influenced by the amount and quality of rations consumed because broiler chickens need sufficient nutrients to support the growth process in body tissues. This research conducted by Nangoy et al. (2022) also states that body weight gain is closely related to ration consumption. If ration consumption is disrupted, the growth of broilers will also be disrupted.

Turmeric is a rich source of enzymes that play a crucial role in regulating the digestive function of feed ingredients. As highlighted by Kusbiantoro and Purwaningrum (2018), the curcumin and essential oils in turmeric act as anti-inflammatory, antioxidant, and anti-microbial agents, thereby enhancing the work of digestive organs and reassuring the positive impact of turmeric on broiler chickens.

It can be concluded that turmeric has a positive effect on increasing the total body weight of chickens through different treatments. The combination of curcumin and essential oils found in turmeric has the potential to increase appetite by accelerating the process of emptying stomach contents, a promising aspect for its use in broiler chicken feed (Khaysia & Wulandari, 2023).

In addition to curcuminoids and essential oils, turmeric rhizomes contain other compounds such as starch, fat, protein, chamfer, resin, resin gum, calcium, phosphorus, and iron. Essential oils in turmeric can provide anti-microbial effects, and curcumin is anti-inflammatory and improves the work of digestive organs (Rohmah, 2024). The addition of turmeric flour to animal feed at the levels of 0.5%, 1%, and 2% showed an effect but not significantly on the increase in body weight due to the growth rate being relatively equal to the amount of ration consumption. Adding natural ingredients up to 1.5% has not been able to change the nutrient absorption process significantly. Decreased palatability is the reason that causes poultry to be not optimal in consuming feed, which is because the addition of the quality of turmeric flour to the ration can bring out the dominant taste and smell (Fransisco Heryfianto et al., 2015).

C. **Ration Conversion**

The results of the analysis of daily body weight gain in broiler chickens aged 7-12 days in the starter phase fed with turmeric flour in the complete ration can be seen in table 3 below:

Tabel 3. Ration conversion results in starter phase broilers fed with turmeric flour in rations with different levels.

Replication	**Treatment**		
	P0	**P1**	**P2**
1	0,80	0,76	0,73
2	0,76	0,77	0,70
3	0,89	0,70	0,79
4	0,86	0,69	0,73
5	0,88	0,72	0,70
Average	**0,82^{b}**	**0,72^{a}**	**0,73^{a}**

Note ^{ab} In the row of the mean shows a significant difference (P <0.05)

Our analysis of variance reveals a significant impact of turmeric flour in the ration on ration conversion (P <0.01). The ration conversion rate of broiler starter chickens at P0: 0.82, P1: 0.72 and P2: 0.73. This finding is of great significance in understanding the role of turmeric flour in poultry nutrition and feed efficiency.

The table of ration conversion results reaffirms the key finding that body weight gain increases with the use of turmeric flour in feed. This finding, consistent with Umam et al. (2014), underscores the importance of the ratio between feed consumed and weight gain achieved in understanding feed efficiency in broiler chickens.

Feed conversion in the control P, or P0, significantly differed from the turmeric flour treatment in the starter chicken ration. Low feed conversion indicates higher feed utilization efficiency, which is a key consideration for poultry nutritionists and agricultural scientists. This opinion is supported by Alwi et al. (2019), who state that low ration conversion shows a picture of

good feed utilization efficiency. Dharmawan et al. (2016) noted that the feed conversion of chickens is influenced by temperature, environment, growth rate, chicken health, feed consumption, and body size; the level of broiler preference for the ration also influences the amount of ration consumed. The more broilers are interested in the ration provided, the more ration consumed (Yani et al., 2020).

Conclusion

The results showed that the provision of turmeric flour up to 2% can increase feed consumption, body weight gain and reduce ration conversion significantly.

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