

The Effect of Fermented Banana Skin Flour on The Growth of Super Kampung Chicken Age 3 - 10 Weeks

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ABSTRACT

Super kampung chicken is currently a very lucrative new business opportunity. The demand for native chicken has increased significantly due to high consumer demand. Super kampung chicken or superior local broiler is the result of a cross between kampung chicken and purebred chicken which has a faster growth rate than local kampung chicken, so people call it super kampung chicken. One of the problems in rearing super kampung chickens is their low productivity. Therefore, to increase productivity, it can be done by paying attention to the nutrients in the ration. The fact that we are currently facing that the price of commercial feed is very expensive, it is necessary to look for alternative feed ingredients as a substitute. One alternative feed is to utilize banana peel waste which contains quite complete nutrition but a fermentation process must be carried out to make it easier to digest. The purpose of this study was to determine the effect of fermented banana peel flour on the growth of 10-week-old super-village chickens. The design used in this study was a completely randomized design (CRD) consisting of 5 treatments and 3 replications, while the treatment was R0 = ration without fermented banana peel flour content. R1 = Ration containing 2.5% fermented banana peel flour. R2 = Ration containing 5% fermented banana peel flour. R3 = Ration with fermented banana peel flour content of 7.5%. R4 = Ration containing 10% fermented banana peel flour. Each treatment was repeated 3 times. The addition of fermented banana peel flour had a very significant effect ($P < 0.01$) on the research variables of weight gain, final body weight and ration consumption. Meanwhile, initial body weight and FCR had no significant difference ($P > 0.05$).

Keywords: *Super Kampung Chicken, Growth, Fermented Banana Peel Flour.*

1. Introduction

The livestock sector plays a significant role in national food security through the provision of animal protein, especially in the poultry sector. This is because businesses in the poultry sector have become one of the business fields that many Indonesians are looking at, one of which is raising super kampung chickens. Super kampung chicken farm has the potential to be developed, especially in Bali, namely for culinary needs and traditional ceremonies. Population of super kampung chickens in Bali in 2020 reached 2,938,708 million heads [1]. Super kampung chickens have faster growth than local kampung chickens [2]. Super kampung chicken is currently a very lucrative new business opportunity. The demand for kampung chicken's meat has increased significantly due to high consumer demand. Super kampung chicken meat is a good source of animal protein. Based on the animal protein consumption standards set [3] a minimum of 6 grams/capita/day or the equivalent of 10.1 kg of meat, 3.5 kg of eggs, and 6.4 kg of milk/capita/year. Therefore, to increase productivity, it can be done by paying attention to the nutrients in the ration. One of the nutrients that affect the

growth and productivity of super free-range chickens is protein. The protein content in the ration affects the growth and productivity of super kampung chickens.

Super kampung chicken in its maintenance, requires good quality feed to fulfill its nutrition. A perfect feed with a balanced nutritional content will provide optimal results. The reality that is currently being faced is that the price of commercial feed is very expensive [4]. To get fast growth of chickens and high productivity, sufficient feed is needed that contains the nutrients needed, both in quality and quantity. Weight gain was influenced by ration consumption [5]. These food substances such as carbohydrates, proteins, fats, minerals and vitamins must be available in the ration. The ration is the largest cost component, around 60-80% of all production costs for poultry [4]. Emphasized that the main factors influencing weight gain are the amount of chicken ration consumption and the energy and protein content contained in the ration [6], because energy and protein are very important in influencing the speed of weight gain, If the food is sufficient and balanced with the substances in it, growth will be fast and livestock will reach a certain weight earlier [7]. In order to reduce production costs as small as possible without reducing optimum production, it can be done by utilizing alternative feed ingredients that have high nutritional content, are easily available and are inexpensive. One alternative feed is to utilize banana peel waste which contains quite complete, such as carbohydrates, protein, fat, calcium, iron, phosphorus, several vitamins such as B and C, and water. Besides being high in crude fiber, banana peels also contain anti-nutrients in the form of tannins. Tannins are antinutrients that can bind to proteins to form complex bonds, so that these proteins are difficult to digest by protease enzymes. One way to reduce the anti-nutritional content and increase the nutritional content of banana peels is by fermentation. Fermentation is one of the efforts that can be made to change feed ingredients with low prices and low quality into feed ingredients with better quality [8].

One alternative feed is to use banana peel waste which contains quite complete, including carbohydrates, protein, fat, calcium, iron, phosphorus, several vitamins such as B and C, and water. Plantain peel from an economic point of view has a fairly high potential, among others, as an efficient feed ingredient in the future, of course it is easy to obtain. Banana peel contains 3.63% crude protein, 2.52% crude fat, 18.71% crude fiber, 7.18% calcium and 2.06% phosphorus [9]. Besides being high in crude fiber, banana peels also contain anti-nutrients in the form of tannins. Tannins are antinutrients that can bind to proteins to form complex bonds, so that these proteins are difficult to digest by protease enzymes. Food ingredients containing tannins taste astringent (astringent), this is due to the formation of complexes between tannins and proteins in the mouth [10]. Tannins will reduce feed consumption due to the astringent taste, and will bind to feed protein in the intestine which causes a decrease in digestibility and protein absorption [11]. Farida et al. (2000) [12] suggested that administration of tannins in poultry reduces protein digestibility. It was further stated that tannins were positively correlated with digestibility values. One way to reduce the anti-nutritional content and increase the nutritional content of banana peels is by fermentation.

The use of fermented banana peel waste as animal feed has good prospects. The greater the addition of fermented kepok banana peels (*Musa paradisiaca* L.) in the ration, the lower the dry matter digestibility and organic matter digestibility [13]. Where the use of fermented Kepok banana peels in compiling the optimum ration at the addition of 5%. Kepok banana peels can replace corn as much as 30% or 15% in broiler chicken rations [14]. From the results of Wiarta (2018) [15], giving various levels of fermented banana peels did not have a significant effect on the appearance of male Bali ducks. However, giving up to 21% was still able to increase the growth of male Bali ducks. The purpose of this study was to determine how the effect of fermented banana peel flour in the ration on the growth of super-village chickens aged 3 - 10 weeks.

2. Materials and Methods

This research was conducted on Jln. Sedap Malam Denpasar, located in Kesiman Village, Denpasar City, Bali. The study lasted for 10 weeks, starting from the treatment from September 9, 2021 to November 4, 2021. The kampung chickens used in this study were super kampung chickens aged 3-10 weeks. The tools used in this research are: plastic size 1 kg, board marker, big jar, cable teas for chicken mark, and electronic scale. The daily maintenance of the chickens are by giving ration and drinking water by ad-libitum, given two times a day in the morning and evening, the given drinking water comes from the drill well near the research cage. The dinking water is cleaned every week to prevent disease, then filled again with new water.

The fermented banana peel flour was made by some steps, they are: The banana peel waste obtained from fried banana traders in several stalls is collected. Banana peels are cut and chopped with a size of approximately 2-3 cm. Banana peels that have been cut 2-3 cm are dried in the sun. After the banana peel is dry, which is marked by the hardening of the banana skin but it is easy to break (brittle) and until the original color changes to brownish black, after the banana peel is dry, the milling process is then carried out into flour. Banana peel flour is ready to be fermented with EM4 and Molasses. Mix the fermenter ingredients (5 liters of water, 100 ml of Molasses and EM4 3 bottle caps. 6 kg of banana peel flour is placed on a tarp and sprayed with fermenter mixture, namely, (5 liters of water, 100 ml of molasses and EM4 3 bottle caps while stirring so that evenly as a whole). After the banana peel and fermenter ingredients are evenly mixed, put it in a medium size jar. Press the banana peel until it is solid so that there are no gaps or air cavities in the jar. Next, the jar is taped so that air cannot enter the jar. After 1 week the jar can be opened and if the fermented banana peel flour is overgrown with fungus, the mushrooms are discarded. The fermented banana peel flour is aerated for 1-2 days, so that the fermented product is dry and not moldy. And then it is ready to be mixed into other feed ingredients which will later become a ration formula.

Table 1.
Ration composition mix

Composition	Treatment				
	R0	R1	R2	R3	R4
Concentrate 511	30	30	30	30	30
Corn flakes	42	35,5	34	30,5	29,5
Fermentated banana peel flour	0	2,5	5	7,5	10
Rice bran	11	15	14	15,5	14
Fish flour	15	15	15	14,5	14,5
Coconut oil	1	1	1	1	1
Mineral	1	1	1	1	1
Total (%)	100	100	100	100	100

The design used in this study was a completely randomized design (CRD) consisting of 5 treatments and 3 replications, while the treatment was R0 = ration without fermented banana peel flour content. R1 = Ration containing 2.5% fermented banana peel flour. R2 = Ration containing 5% fermented banana peel flour. R3 = Ration with fermented banana peel flour content of 7.5%. R4 = Ration containing 10% fermented banana peel flour. Each treatment consisted of 3 replications, each replication contained 5 kampung chickens, so the number of kampung chickens used in this study was 75. The variables observed in the study were initial body weight, final body weight, weight gain, ration consumption and FCR. The weight gain result obtained by weighing check for the chicken every week. Ration consumption counted every week by weighing ration given to the chicken in a week minus the leftover ration in the end of the week then divided by 7 to get the daily consumption. The FCR result can be found by sum up the ration consumption and divided weight gain.

3. Results and Discussion

3.1 Results

Based on the results of analysis of variance, the results of research using fermented banana peel flour in chicken rations showed a very significant effect ($P < 0.01$) on the research variables of weight gain, final body

weight and ration consumption. Meanwhile, initial body weight and FCR had no significant difference ($P>0.05$).

Table 2.
The effect of giving fermented banana peel flour in the ration on the growth of super free-range chickens aged 3 - 10 weeks

Variable	Treatment					SEM (3)
	R0	R1	R2	R3	R4 (1)	
Initial Weight (g)	193.47 a	193.93 a	193.19 a	193.03 a	193.04 a (2)	0.20
Final Weight (g)	692.91 c	746.69 bc	781.51 bc	905.99 a	808.14 b	15,70
Weight Gain (g)	499.44 c	552.77 bc	588.31 bc	712.96 a	615.10 b	15.68
Ration Consumption (g)	2170.56 c	2332.17 ab	2357.23 b	2598.02 a	2506.55 ab	27.92
FCR	4.37 a	4.23 a	4.01 a	3.66 a	4.10 a	0.11

Notes: 1. R0 = Ration without fermented banana peel flour content. R1 = Ration containing 2.5% fermented banana peel flour. R2 = Ration containing 5% fermented banana peel flour. R3 = Ration with fermented banana peel flour content of 7.5%. R4 = Ration containing 10% fermented banana peel flour. 2. Values with the same letter in the same row indicate a non-significant difference ($P>0.05$). 3. SEM (Standard Error Of Treatment Means).

3.2 Discussion

The best results were obtained in the R3 treatment, both final body weight (905.99 g/head), weight gain (712.96 g/head), ration consumption (2598.02 g/head), and feed conversion (3.66 g./head). This indicates that the application of fermented banana peel flour in the ration is able to contribute significantly to the growth of 10-week-old super chickens. The level of ration consumption in the R3 treatment was very high so that the increase in weight of the chickens genuinely increased, but compared to the R0 treatment there was a decreased. This is due to the R0 treatment without fermented banana peel flour content, that the crude fiber content in banana peels of 13.5259% decreased after fermentation to 10.0283%. Fermentation can lead to beneficial changes such as improved feed quality, both in terms of nutrition and digestibility. Factors that affect the final body weight of free-range chickens include genetics, sex, ration protein, environmental temperature, housing management and sanitation [16]. Factors that influence the growth of broiler chickens are nutritional factors which include protein, vitamins, minerals and calcium [17]. Chickens that consume the same amount of protein have the same growth rate. Growth can occur with an increase in the number of cells, called hyperplasia and can also occur with an increase in size called hypertrophy [18].

Weight gain is the ability of a chicken in its growth period, weight gain is obtained by reducing the final weight (g/head) with the initial weight (g/head). From the results of this study, the highest weight gain was obtained at R3 which was 712.96 g/head and the lowest result was at treatment R0 of 499.44 g/head. This means that the application of fermented banana peel flour in the ration can increase the weight gain of native chickens aged 3-10 weeks. This is because the balance of nutrients in the feed has been met. Feed palatability is the attraction of feed or feed ingredients that can increase the appetite of livestock [19]. The nutrient content of energy and protein in the ration is an important factor in determining the amount of ration consumed production stage, and ration energy [20].

Conversion of ration is the ratio between the amount of ration consumption and body weight gain in a certain time unit. The smaller the ration conversion value, the more efficient the use of the ration is. The R3 treatment with fermented banana peel flour in the ration gave the best results for the ration conversion, which was 3.66 g/head. This is because the consumption of rations in the R3 treatment by giving fermented banana peel flour was 7.5% lower than the R1, R2, and R4 treatments, so that the use of rations into meat could be streamlined. This is in accordance with the opinion of Allama et al. 2012 [21] who said that the low ration conversion value indicates that the efficiency of the use of rations is good, because the more efficient the

chicken consumes rations to produce meat. The conversion of rations was influenced by genetics, body weight, environmental temperature, health, and the adequacy of ration nutrition [22, 23]. The ration conversion value is influenced by the amount of ration consumption and body weight gain [24]. Feed conversion is influenced by the level of feed consumption, digestibility and the use of food substances that must be balanced [25].

4. Conclusion

Fermented banana peel flour in the rations of super native chickens had a very significant effect ($P < 0.01$) on the research variables of weight gain, final body weight and ration consumption. Meanwhile, initial body weight and FCR had no significant difference ($P > 0.05$). In the R3 treatment, the administration of 7.5% fermented banana peel flour in the ration of super kampung chickens was able to show the best results on final body weight and weight gain of super kampung chickens.

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