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The Effect of Giving Sorghum on the Growth of Super Village Chickens Age 3-10 Weeks

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Abstract

Super free-range chicken farms in Indonesia at this time have experienced very rapid development. One of the poultry that is currently being developed in Indonesia is the super village chickens. The current reality is that the price of commercial feed in the market is felt by farmers to be very expensive, while feed is the largest component in poultry farming, where the cost of feed can reach 60-70% of the total production cost, so it is very important to look for other alternative feeds in the availability of ration feed ingredients. to keep production costs as small as possible without reducing optimum production. The use of sorghum seeds in the ration of super native chicken is (substitute) for corn because its nutritional content is almost the same as corn. The purpose of this study was to determine the extent to which the provision of sorghum in the ration could increase the growth of super native chickens. The design used in this study was a completely randomized design (CRD) which consisted of 5 treatments and 3 replications. S0 (Control) of chickens that were not given sorghum, S1 of chickens that were fed a diet containing 7.5% sorghum, S2= 15%, S3= 22.5% and S4= 30%. The arrangement of 3-story cages with a total of 15 plots, each containing 5 chickens, so that 75 chickens were used with a body weight range of 183.2-210.0 g. From the results of the study, the administration of various levels of sorghum did not have a significant effect (P>0.05) on final body weight, weight gain, ration consumption, and ration conversion for super-village chickens aged 3-10 weeks. In the administration of various levels of sorghum at S0 (Control) it was higher than the S1, S2, S3, and S4 treatments on final body weight, weight gain, ration consumption, and ration conversion for super-village chickens aged 3-10 weeks . The conclusion of this study was that the application of various levels of sorghum did not significantly affect the growth of Super Kampung Chickens aged 3-10 weeks. The provision of various levels of sorghum to super native chickens aged 3-10 weeks at S0 (Control) was higher than the S1, S2, S3 and S4 treatments on final body weight, weight gain, ration consumption, and ration conversion.

Keywords: Super village chickens, Growth, Sorghum

1. Introduction

Super free-range chicken farms in Indonesia at this time have experienced very rapid development. This development is accompanied by the increasing public demand for meat as a source of protein. Fulfillment of meat has good future prospects, so the ideal livestock to be developed is poultry [1]. One of the poultry that is currently being developed in Indonesia is the Super kampung chicken.

Cultivation of super free-range chicken is currently a very lucrative new business opportunity, because the demand for super free-range chicken has increased significantly as a result of high consumer demand. Super superior free-range chicken is the result of a cross between free-range chicken and layer chicken (breed), has a faster growth rate than local free-range chicken, so people call it super free-range chicken [2]. Super free-range chicken has faster growth and the quality of the meat is much better, denser, tastes more

savory, has low fat or cholesterol content, high protein content, low mortality rate, and is easy to adapt to climate change. Environment [3]. The harvest age of super free-range chickens is approximately two months [4].

Native chicken in its maintenance requires quality feed to fulfill its nutrition, because feed is one of the most important factors in the super-village chicken business. The high or low nutritional value of a feed depends on the quality and quantity contained in it. The suitability of the nutrient content in the feed is needed to increase the growth of super free-range chickens. The current reality is that the price of commercial feed in the market is felt by farmers to be very expensive, while feed is the largest component in poultry farming, where the cost of feed can reach 60-70% of the total production cost, so it is very important to look for other alternative feeds in the availability of ration feed ingredients. to reduce production costs as small as possible without reducing optimum production [5].

Sorghum is one of the plants developed to be used as a functional food source for flour production as a substitute for wheat in food products [6]. The main obstacle to the use of sorghum as food is the content of tannins which affect the taste and are anti-nutritional which will reduce the quality of nutrient absorption, especially in protein digestion [7]. The highest tannin content of sorghum seeds is in the seed coat, so that in the production process the sorghum husk is first removed to reduce the tannin content in sorghum bran which produces a by-product in the form of sorghum bran [8].

The use of sorghum seeds in the feed rations of super native chickens is (substitute) for corn because the nutritional content is almost the same as corn [9]. The nutritional content of sorghum seeds is based on 100% dry matter (BK) in the form of 10.26% protein; crude fiber 2.72%; fat 2.70%; Ca 0.90%; and P 0.38%, while the dry matter (BK) and organic matter (BO) production of sorghum were 58.61% and 58.65%, respectively [10] . Sorghum seeds can also be used to feed super free-range chickens, but the use of sorghum for animal feed still has differences of opinion regarding the tannin content of around 0.4%-3.6% which in certain amounts can inhibit livestock growth [11]. The results of research conducted by Tanggu et al. (2018) [12] explained that the addition of sorghum in the ration regarding the provision of sorghum at the level of 14% still had a significantly different effect on the growth of poultry. Based on the description above, further research was carried out on the effect of giving sorghum on the growth of super free-range chickens aged 3-10 weeks.

2. Material and Methods

This research was conducted for 10 weeks in a cage located at Jalan Sedap Malam, Banjar Kebon Kori Klod, Gang Melati, No. 15, Kesiman Village, East Denpasar, Bali Province. The tools used in the study were cages, drinking water containers, hoses, scales, buckets, plastic containers, label paper, 1 kg mica plastic and stationery. The material used was the chickens used in this study were native chickens aged 3 weeks having a homogeneous body weight and without sexing (unsexing), 75 chickens used. Native Chicken obtained from PT. Tohpati Poultry, Jl. WR. Supratman 281, Denpasar, Bali Province. The ration used in this study was a self-mixed ration consisting of: sorghum, concentrate, rice bran, corn, fish meal, coconut oil, and minerals. The drinking water provided comes from bore well water. The composition of feed ingredients and the

conversion of feed substances in the ration treatment of native chickens aged 3-10 weeks can be seen in Table 1 and Table 2.

Table 1. Composition of Research Ration Ingredients

Material Name	Treatment Ration [1)]				
	S0 (%)	S1 (%)	S2 (%)	S3 (%)	S4 (%)
Concentrate	30	30	30	30	30
Corn	40	33	26	19	11.5
Sorghum	0	7.5	15	22.5	30
Rice Bran	12	12	12	12	12
Fish flour	16	15.5	15	14.5	14.5
Coconut oil	1	1	1	1	1
Neutralize	1	1	1	1	1
Total	**100**	**100**	**100**	**100**	**100**

Information :

1. The ration without sorghum as control (S0), containing sorghum , was 7,5 % (S1), 15% (S2), 22.5% (S3), and 30 % (S4), respectively .

Table 2. Composition of Nutrients in Ration Treatment of Kampung Chickens 3 - 10 Weeks

Nutrients	Treatment Ration					
	S0	S1	S2	S3	S4	Standard *
Crude Protein (%)	18,24	18,15	18,11	18,18	18,15	18-21.4*
ME (kcal/kg	3045	3031	2987	2979	2979	2600-3100*
SK (%)	3,5	3,6	3,7	3,6	3,2	7.0
Crude Fat (%)	5,2	5,2	5,2	5,2	5,2	2.5-7.0
calcium (%)	1,5	1,5	1,5	1,5	1,5	0.9-12
P %	0,7	0,7	0,7	0,7	0,7	0.6-0.9

Note: *Based on calculations according to Scott et. al., (1982)
Based on SNI Recommendation (1995)

The design used in this study was a completely randomized design (CRD) with 5 treatments and 3 replications. The treatments used were diets without the addition of sorghum (R0), diets containing 7.5% sorghum (S1), diets containing 15% sorghum (S2), diets containing 22.5% sorghum (S3) and r ration containing 30% sorghum (S4). The variables observed in this study were initial body weight, final body weight, weight gain, ration consumption and feed conversion ratio (FCR). The research data were statistically processed using analysis of variance. If there is a significantly different result ($P<0.05$) between treatments, then continue with Duncan's smallest real distance test [13].

3. Results and Discussion

3.1 Research Results

3.1.1 Initial Body Weight

Analysis of variance showed that the initial body weight of super free-range chickens showed no significant difference ($P>0.05$). Initial body weight relatively homogenous ranged on average ± 183.2 – 210.0 g/head.

Final Weight

The treatment by giving sorghum to the growth of super native chickens was statistically not significantly different ($P>0.05$) to the final body weight. The highest

average was obtained at S0 which was 828.49 g which was then followed by S1, S2, S3 and S4. The treatments for S1, S2, S3 and S4 were 1.79%, 2.67%, 4.44% and 4.95% lower than S0 statistically not significantly different (P>0.05). The treatments for S2, S3 and S4 were 0.90%, 2.70% and 3.22% lower than S1 statistically not significantly different (P>0.05). In the S3 and S4 treatments, it was 1.81% and 2.35% lower than the S2 treatments which were statistically not significantly different (P>0.05). (Table 3)

Weight Gain

The weight gain on giving sorghum to the growth of super free-range chicken was not statistically significant (P>0.05). The highest treatment was obtained at S0 which was 631.23 g which was then followed by S1, S2, S3 and S4. In the S1, S2, S3 and S4 treatments, 2.67%, 3.51%, 6.38% and 6.98% lower than the S0 treatments were not significantly different (P>0.05). In the S2, S3 and S4 treatments, 0.87%, 3.82% and 4.43% lower than the S1 treatments were statistically not significantly different (P>0.05). In the S3 and S4 treatments, it was 2.98% and 3.59% lower than the S2 treatments which were not significantly different (P>0.05) (Table 3)

Ration Consumption

The amount of ration consumption during the study on the provision of sorghum on the growth of native chickens was statistically not significantly different (P>0.05). The highest treatment was obtained at S4 which was 2835.54 g which was then followed by S3, S2, S1 and S0. In the S3, S2, S1 and S0 treatments, 0.64%, 0.68%, 1.57% and 1.63% lower than the S4 treatments were statistically not significantly different (P>0.05). In the S2, S1 and S0 treatments, 0.04%, 0.94% and 1% lower than the S3 treatments were statistically not significantly different (P>0.05). In the S1 and S0 treatments, it was 0.90% and 0.97% lower than the S2 treatments which were statistically not significantly different (P>0.05). (Table 3)

Ration Conversion

The treatment by giving sorghum to the growth of super free-range chickens was statistically not significantly different (P>0.05) on the conversion of rations. The highest treatment was obtained at S4 which was 4.85 which was then followed by S3, S2, S1 and S0. In S3, S2, S1 and S0 treatments, 1.03%, 4.53%, 6.19% and 8.87% lower than S4 treatments were statistically not significantly different (P>0.05). In the S2, S1 and S0 treatments, 3.54%, 5.21% and 7.92% lower than the S3 treatments were statistically not significantly different (P>0.05). The S1 and S0 treatments were 1.73% and 4.54% lower than the S2 treatments which were statistically not significantly different (P>0.05). (Table 3)

Table 3 Provision of Sorghum on the Growth of Native Chicken Age 3 – 10 Weeks

Observation Variables	Treatment					SEM**
	S0*	S1	S2	S3	S4	
Initial Weight Loss (g/tail)	197.26 [a]	199.26 [a]	201.40 [a]	196.53 [a]	200.27 [a]	1.95
Final Weight (g/tail)	828.49 [a]	813.68 [a]	806.37 [a]	791.71 [a]	787.46 [a]	11.25
Weight Gain (g/tail)	631.23 [a]	614.42 [a]	609.08 [a]	590.94 [a]	587.19 [a]	12.26
Consumption Ration (g/tail)	2789.20 [a]	2790.93 [a]	2816.40 [a]	2817.46 [a]	2835.54 [a]	16.77

FCR (%)	4.42 [a]	4.55 [a]	4.63 [a]	4.80 [a]	4.85 [a]	0.10

*The ration without sorghum as control (S0), containing sorghum , was 7,5 % (S1), 15% (S2), 22.5% (S3), and 30 % (S4), respectively .
SEM (Standard Error of The Treatment Means)
Values with the same letter in the same row indicate a non-significant difference (P>0.05).

4.2 Discussion

In the study of the effect of giving sorghum on the growth of super free-range chickens on final body weight and the weight gain of super-village chickens, statistically, there was no significant effect (P>0.05). The highest final body weight was in treatment S0 (control) then S1 (7.5%), S2 (15%), S3 (22.5%) and S4 (30%). For the highest weight gain in treatment S0 (control) decreased in treatment S1 (7.5%), S2 (15%) S3 (22.5%) and S4 (30%). Several factors that affect the final body weight and weight gain from the provision of sorghum due to the Super free-range chickens have disadvantages, namely the level of consumption of more rations, and the nutritional content in the ration must be balanced to support rapid growth [14]. The increase in chicken weight reflects the level of chicken's ability to digest feed to be converted into body weight. Weight gain is determined by reducing the initial weight and final body weight [15]. Sorghum seeds can be used for super free-range chicken feed, but the use of sorghum for animal feed is still a difference of opinion regarding the tannin content of 0.4%-3.6% in a certain amount which can inhibit livestock growth [11]. The main obstacle to the use of sorghum as feed is that the tannin content affects the taste and is anti-nutritive which will reduce the quality of nutrient absorption, especially in protein digestion [7]. Tannins are anti-nutritional substances that inhibit the work of digestive enzymes and have the ability to bind to proteins in the intestine [16].

High-tanin diets reduce nitrogen retention, protein utilization and digestibility in super-range chickens. Due to the negative effect of sorghum tannins, it is recommended that the use of these grains not exceed the 20% limit as a substitute for other grains in the ration, especially those with high tannins [17, 12]. The factors that influence the growth of livestock other than feed consumption are the type of livestock, breed of livestock, gender, type of livestock and maintenance management [18]. The ability to convert the nutrients contained in the ration into meat is indicated by weight gain [19].

Based on the results of the study by giving various levels of sorghum to the consumption of super free-range chicken rations, statistically there was no significant effect (P>0.05). Consumption of rations in treatment S4 (30%), the highest results were obtained compared to other treatments. The highest ration consumption was S4 (30%) then S3 (22.5%), S2 (15%), S1 (7.5%) and S0 (control). The factors that can influence feed consumption are palatability which is influenced by smell, taste, texture and color of feed, so that it affects appetite [20]. Environmental temperature and calories are the main factors that affect the daily consumption of rations. It is further stated that feed consumption can be influenced by various factors, including the nutritional content in the feed.

The preparation of a good ration will affect the level of livestock consumption and will affect the final body weight of livestock before slaughter [21]. In cold air, the ration consumed is used more to maintain body temperature than to be converted into meat [22]. Consumption will increase when given a low-energy ration and decrease when given a high-energy ration [23]. In the performance test on broilers, Sudarma et al. 2011 [24]

reported the occurrence of depression in weight gain, feed intake, and feed gain due to tannin treatment in broiler feed. The more material that is digested through the digestive tract means faster flow causing more space available for addition of food, this increase in consumption speed corresponds to the increase in digestibility of food [25]. Sorghum is an alternative food to replace carbohydrates. The carbohydrate content reached (74.63 g/100 g material) which was higher than wheat (71.97 g/100 g material) and ranked third after rice (79.15 g/100 g material), and corn (76.85 g). /100 g of material) [26].

Based on the results of the study, the addition of various levels of sorghum had a statistically insignificant effect (P>0.05) on feed conversion. This was caused by the consumption of rations and weight gain between treatments which were not significant. Factors affecting feed conversion are temperature, genetics, feed quality, ventilation, sanitation, type of ration, disease, water quality, and maintenance management. Some of the main factors influencing feed conversion were genetics, ration quality, disease, temperature, cage sanitation, ventilation, treatment, and cage management [27]. The lighting factor also played a role in influencing the conversion of the ration, the rate of travel of the ration in the digestive tract, the physical form of the ration and the nutritional composition of the ration.

4. Conclusion

The conclusion of this study was that giving various levels of sorghum did not have a significant effect on the growth of Super Kampung Chickens aged 3-10 weeks. The provision of various levels of sorghum to super native chickens aged 3-10 weeks at S0 (Control) was higher than the S1, S2, S3 and S4 treatments on final body weight, weight gain, ration consumption, and ration conversion.

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