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Effect Use of Cricket Flour (*Gryllus Sp*) in The Ration on Body Weight Gain, Consumption Rations and Ratio Conversion of Balenggek Cock Chickens For 12 Weeks

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ABSTRACT

This study aims to determine how using cricket flour in rations affects body weight gain, ration consumption, and ration conversion of Balenggek crowing chickens for 12 weeks. Completely Randomized Design (CRD) 4 (four) treatments and 4 (four) replications, with 3 AKB males per replication. Treatment consists of P0 = No use of 0% cricket flour, P1 = Use of 2% cricket flour, P2 = Use of 4% cricket flour, P3 = Use of 6% cricket flour. The parameters measured in this research are Body Weight Gain, Ration Consumption, and Ration Conversion. The research results showed that the average body weight gain ranged from 45.53 -70.24 gr/head/week, feed consumption 296.69 - 319.30 gr/head/ week, and ration conversion 4.63 - 6.51%. From the research results it can be concluded that the addition of cricket flour in the ration had a very significantly different effect (P<0.01) on body weight gain, ration consumption, and ration conversion of balenggek roosters for 12 weeks with the best treatment P3 (Use of 6% Cricket Flour).

Keywords: Cricket flour, balenggek crowing chicken, PBB, consumption, ration conversion

INTRODUCTION

Balenggek crowing chicken is a local chicken specific to West Sumatra. Balenggek crowing chickens are the proud germplasm of the Minang region that needs to be preserved and developed. That is why the Balenggek crowing chicken is used as the mascot of Solok Regency. The Balenggek crowing chicken is a chicken native to West Sumatra that grows in the Payung Sekaki and Tigo Lurah sub-districts of Solok Regency. This chicken is classified as a singing chicken because it has a melodious crowing sound that is pleasant to hear. The balenggek crowing chicken is endemic because its distribution area is only limited to the Solok area and is not found in other areas. The Balenggek crowing chicken is thought to be a

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derivative of the Sumatran red jungle fowl from gallus - gallus which is likely to have gene mutations. It is suspected that the Balenggek crowing chicken which developed in the Payung Sekaki sub-district is a descendant of the ornamental type Sumatran red jungle fowl (Nishida et al, 1980). Balenggek crowing chickens in central areas are usually kept by releasing them around the breeder's house and eating various types of insects. One of the protein sources for balenggek roosters may be thought to be crickets in the forest around the breeder's house. Efforts that can be made to increase the Balenggek crowing chicken livestock population include providing sufficient and good quality feed, especially in terms of protein. Feed is one of the largest components of all costs that must be incurred in the poultry farming business, which can reach 70% (Nawawi and Nurrohmah, 2011). Widodo (2009) stated that the feed consumed by poultry greatly determines body weight gain and thus influences the efficiency of a business. Feed consumption is influenced by environmental temperature, chicken health, housing, feed container, food content in the feed, and stress that occurs in the poultry (Faiq, et al. 2013). Determining the quality and quantity of rations requires the farmer's knowledge and skills in selecting and mixing feed ingredients into a quality ration. One alternative feed that pays attention to quality is by providing cricket flour (Gryllus sp) in the feed. Bayu (2014) stated that cricket flour contains BK, PK, LK, and SK respectively of 75.79%, 59.72%, 20.86%, and 10.19%. It is hoped that the use of cricket flour can be a substitute for feed ingredients such as fish meal and shrimp meal. Crickets also contain omega 3, 6, and 9 fatty acids which are good for cell growth. The use of cricket flour in broiler chicken feed by up to 2% can increase feed consumption, body weight gain, production index, and decrease feed conversion (Bayu, 2014). The results of research by Inzagi, (2020) stated that the use of cricket flour in rations up to a level of 6% could increase body weight gain, and feed consumption and reduce the ration conversion of balenggek crowing chickens aged 1 - 9 weeks. The high nutritional content of cricket flour, especially protein content, and essential amino acids, especially linoleic acid, make cricket flour have the potential to be used as animal feed, especially as a source of protein for balenggek crowing chickens.

This research aims to determine the effect of using cricket flour in rations on body weight gain, ration consumption, and

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ration nversion of balenggek crowing chickens for 12 weeks.

MATERIALS AND METHODS

The material used was 48 male Balenggek roosters aged 12 weeks, obtained from the results of hatching carried out by themselves whose eggs were obtained in Tigo Lurah District, Solok Regency.

The research method used in this research is an experimental method using a Completely Randomized Design (CRD) with 4 (four) treatments and 4 (four) replications. Each experimental unit consisted of 3 male AKB tails weighing 254.47 – 464.73 grams.

There were 4 types of treatment used, namely: P0 = Without use of 0% cricket flour, P1 = Use of cricket flour 2%, P2 = Use of cricket flour 4%, P3 = Use of cricket flour 6%

Cricket Flour Processing

The crickets in this study were obtained from Meris Farm Muaro Paneh, Solok Regency. According to Gieseha, et al (2015), the steps for making cricket flour are:

1. Crickets are paralyzed by dousing them with boiling water
2. Then let it air until there is no remaining dripping water.
3. Next, blend the crickets
4. Then pour into a baking dish and bake at 100^{o}C for 1 hour

After that, the crickets are ground again with a blender until they form flour.

Table 1. Substance content of feed ingredients that make up research rations

Bahan Pakan	CP (%)	ME (kcal/kg)	Metionin (%)	Lisin (%)	Ca (%)	P (%)
corn*	8,50	3300	0,18	0,20	0,02	0,30
Rice bran*	12,0	2400	0,25	0,45	0,21	1,00
Soybean Meal*	44,0	2240	0.65	2,6	0,32	0,67
Cassava flour	2,00	3200	0.01	0,07	0,33	0,40
Fish flour*	55,0	2960	1,79	5,07	5,30	2,85
Cricket flour	59,72(1)	4870(2)	1,30(3)	6,20(3)	6,20(3)	1,25(3)

Note : *sinurat (1999), 1)Bayu (2014), 2)Saefullah (2006), 3)Yelmida A. (2008).

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Table 2. Ration Formulation

Feeding	P0	P1	P2	P3
	.....%			
Rice Bran	38	38	38	38
Corn	33	33	33	33
Cassava flour	15	15	15	15
Soybean meal	7	7	7	7
Fish flour	6	4	2	0
Cricket Flour	0	2	4	6
Premix	1	1	1	1
Sum	100	100	100	100

Tabel 3. The content of Nutrient Feeding

The Nutrient	Sum				Requirements
	P0	P1	P2	P3	
Protein Kasar (%)	14,05	14,14	14,23	14,33	14[(1)]
Energi Metabolisme (Kkal/kg)	2815,40	2853,60	2891,80	2930,00	2800-2900*
Pospor (%)	0,76	0,72	0,69	0,66	0,40[(1)]
Kalsium (%)	0,71	0,74	0,76	0,78	1,00[(1)]
Lisin (%)	0,73	0,76	0,78	0,80	0,45[(1)]
Metionin(%)	0,31	0,30	0,29	0,28	0,21[(1)]

Note: Calculation results based on feed ingredient content in Table 6. (1) Ketaren (2010), * Iskandar (2006)

The parameters measured in this research are: The parameters measured in this research are Body Weight Gain, Ration Consumption, Ration Conversion

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RESULTS AND DISCUSSION

The results of the research on average body weight gain, ration consumption, and ration conversion for Balenggek crowing chickens given cricket flour (grams/head/week) for 12 weeks are in Table 4. Based on the diversity analysis, the addition of cricket flour to the ration had a very significantly different effect (P<0.01) on the increase in body weight of Balenggek crowing chickens. This is caused by the higher the protein content of the cricket flour given, the higher the consumption of livestock rations, thus affecting the increase in body weight of the livestock, which means that the high weight gain is influenced by the amount of feed consumed by Balenggek crowing chickens. This is also supported by the opinion of Wahju (2006) that to achieve optimal growth levels by genetic potential, food is needed that contains qualitative and quantitative nutritional elements, thus there is a relationship between growth speed and the amount of food consumed.

Table 4. Average Body Weight Gain, Ration Consumption, and Chicken Ration Conversion Balenggek crowing has given cricket flour (grams/head/week) for 12 weeks

Perlakuan	PBB	Konsumsi Ransum	Koversi Ransum
P0	45,53^{c}	296,69^{b}	6,51^{a}
P1	52,04^{b}	303,39^{b}	5,83^{b}
P2	54,53^{b}	307,37^{b}	5,65^{b}
P3	70,24^{a}	319,30^{a}	4,63^{c}
SE	1,01	3,68	0,09

Note: Different superscripts show very significantly different effects (P<0.01)
P0 = (Without Addition of Cricket Flour)
P1 = (Addition of 2% Cricket Flour)
P2 = (Addition of 4% Cricket Flour)
P3 = (Addition of 6% Cricket Flour)

Based on the DNMRT test, the highest body weight gain was in P3 which used 6% cricket flour in the ration, compared to P2 (4% cricket flour use), P1 (2% cricket flour use), and P0 (without cricket flour use). This is because cricket flour has a high protein and amino acid content, making P3 have a higher body weight gain compared to P0, P1, and P2. According to Rasyaf's (2006) research, livestock body weight is influenced by the quality and quantity of ration consumed by livestock.

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The results of this research are in line with the research of Panjaitan et al. (2012) who stated that providing cricket flour supplementation up to 4% of the total ration can increase body weight gain. Furthermore, research by Inzagi (2020) stated that the use of cricket flour in the ration had a very significant effect (P<0.01) on the increase in body weight of Balenggek crowing chickens aged 1-9 weeks.

Analysis of statistics showed that the addition of cricket flour had a hight significant effect (P<0.01) on the consumption of balenggek rooster rations. This is because cricket flour contains protein and amino acids needed by livestock. Another thing that makes the consumption of rations different is that cricket flour has good nutritional qualities which are needed by balenggek roosters. Cricket flour has a high protein content, namely 59.72% compared to fish meal of 55.00%. Cricket flour also contains complete amino acids such as lysine and methionine which are needed by the body, thereby increasing food consumption. Crickets also contain fatty acids such as palmitic acid, oleic acid, and linolenic acid (Finke 2002).

Based on the DNMRT test, the highest ration consumption was in P3 (6% use of cricket flour), higher than P2 (4% use of cricket flour), P1 (2% use of cricket flour); and P0 (without the use of cricket flour). The high consumption of rations in P3 occurs because cricket flour has a delicious smell, thereby increasing the palatability value. The results of this study are in line with research by Inzagi (2020) which stated that the use of cricket flour in the ration at a level of 6% had a very significant effect (P<0.01) on the consumption of rations of Balenggek crowing chickens aged 1-9 weeks. Treatments P0, P1, and P2 showed no significant differences (P<0.05) in IMR ration consumption. The results of this study are in line with research by Panjaitan (2012) which stated that the use of cricket flour up to 4% had no effect (P0<0.05) on male quail ration consumption.

Analysis of statistics showed that the addition of cricket flour to the ration had a hight significant effect (P<0.01) on the ration conversion of balenggek crowing chickens. This indicates that the quality of the feed when providing cricket flour is quite good because the feed conversion rate shows the level of feed use efficiency. This means that the lower the feed conversion rate, the higher the feed efficiency value and the more economical

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The higher the cricket flour content in the ration, the lower the ration conversion rate. This shows that cricket flour is efficiently used for rations for Balenggek crowing chickens because high feed consumption is followed by good meat formation which influences the increase in body weight of the chickens. Martawidjaja (1997) stated that feed quality determines feed conversion, feed use will be more efficient if the amount consumed is minimal but results in high body weight gain.

Based on the DNMRT test, the lowest ration conversion was in P3 which used 6% cricket flour in the ration, which was lower compared to P2 (4% cricket flour use), P1 (2% cricket flour use), and P0 (without cricket flour use). The ration conversion value at P3 shows the lowest value, this is due to the high consumption of rations and is supported by high body weight gain. The low feed conversion value indicates that P3 with 6% cricket flour is efficient in utilizing the feed into meat. The results of this research are to the research results of Suharto (2016) which stated that the ration conversion for free-range chickens ranged from 4.7 to 5.96. Sari (2018) added that the balenggek crowing chickens' ration conversion ranges from 4.41 to 5.65. Furthermore, the results of research by Inzagi (2020) show that the balenggek crowing chickens ration conversion at the age of 1-9 weeks is 5.3 to 5.7. P1 and P2 have no significant effect ($P<0.05$) on IMR ration conversion, this is because feed conversion is influenced by several factors, such as feed quality, feeding procedures, and animal health which is related to consumption levels.

CONCLUSION

From the research results it can be concluded that the addition of cricket flour in the ration had a very significantly different effect ($P<0.01$) on body weight gain, ration consumption, and ration conversion of Balenggek roosters for 12 weeks with body weight gain, ration consumption and conversion. The ration with the best treatment is P3 (use of 6% cricket flour).

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