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The Effect of Used Cricket Flour (*Gryllus Sp*) in Feeding of Kokok Balenggek Cocks on the Number, Duration, and Frequency of Crowing Crowning For 12 - 24 Weeks

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ABSTRACT

This study aims to determine the effect of using cricket flour (*Gryllus sp*) in the diet on the number, duration, and frequency of crowing crowning of balenggek cocks for 12-24 weeks. This study used 48 male balenggek crowing cocks which were given additional cricket flour diets. The completely randomized design (CRD), with 4 treatments, was used as the experimental design in this research. The treatments were: PO (no cricket flour), Pl (used cricket flour 2%), P2 (used cricket flour 4%), and P3 (used cricket flour 6%). Each treatment was repeated 4 times and each replication consisted of 3 male kokok balenggek cocks. The variables measured in this study were the number of crowings, duration, and frequency of crowing of kokok balenggek cocks at 12-24 weeks of age. The results showed that the addition of cricket flour in the ration had a significantly different effect ($P<0.05$) on the number of crows and the duration of crowing, and a very significant effect ($P<0.01$) on the crowing frequency of balenggek cocks at the age of 12- 24 weeks with the best number of crowings, duration, and frequency of crowing was in P3 (was used of 6% cricket flour).

Keywords; Crickets, diets, crowing

1. INTRODUCTION

The kokok balenggek cocks (KBC) is one of the local Indonesian chicken families that has a geographic distribution in the province of West Sumatra, and has been established through the Decree of the Minister of Agriculture Number 2919/Kpts/OT.140/6/2011 dated June 7, 2011. The KBC population is growing in several villages in Payung Sekaki and Tigo Lurah Subdistricts, Solok Regency.

The kokok balenggek cock (KBC) is a type of singer chicken in West Sumatra. The special characteristic of KBC is its melodious and tiered crowing sound (balenggek: Minang language) where the lenggek can reach 24 syllables.

The uniqueness of the crowing sound of KBC is thought to be the only breed of chicken with the graded crowing type in the world (Rusfidra, 2004). KBC is thought to be a derivative of Sumatran red jungle fowl from gallus-gallus which is likely to have a gene mutation. It is suspected that the kokok balenggek cocks that developed in Payung Sekaki is a derivative of the ornamental type Sumatran red jungle fowl. Efforts to increase the population of the kokok balenggek cocks must continue to be pursued through improved maintenance and genetic improvement as well as management of providing rations that are in accordance with the needs of livestock. So, the diets be given must be highly nutritious and support growth, and also, the rations must be given according to the need to get maximum production. The kokok balenggek cocks in the central area are usually reared by being released around the farmer's house and eating various types of insects. Cricket flour is processed from fresh crickets, dried, and ground into flour for feed mixture. Cricket (Gryllus sp) is one of the insects that are easy to cultivate and has the potential to be developed in Indonesia. Ayu. et al (2014) stated that the amino acid content of lysine and methionine in cricket flour was higher at 4.79 and 1.93% compared to the fish meal which was 4.51 and 1.59%, respectively. Prayitno (2006) stated that crickets contain the hormone progesterone 105.49 ppm; testosterone 31.78 ppm; and 259.535 ppm estrogen. Lysine and methionine are critical amino acids needed by broilers, while testosterone is a hormone that is needed to promote growth in broilers. The use of cricket flour is expected to be able to be an additional feed or substitute for protein source feed ingredients such as fish meal and shrimp meal. The Gaga cocks has syllables in the first wave of 2 syllables, and in the Kokok balenggek cocks there are three syllables consisting of a front and rear crowing. In contrast, in the second wave, the Gaga cocks have a total of 18.4 syllables and The kokok balenggek cocks have 19 syllables. The duration of the rooster's crowing is calculated from the time the rooster crows until it finishes crowing

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Long class dangdut chicken gaga (30.83 seconds), short class (4.20 seconds), and slow type (3.68 seconds) have a longer crowing duration than native chicken (2.28 seconds) (Nurningsih, 2010) and balenggek crows (3.018 seconds, and, the duration of the pelung crowing (3.0-8.9 seconds) is still shorter than the long and short class dangdut gaga chickens, (Rusfidra (2004); Junaidi (2014).

2. METHODS

There were 48 male Kokok balenggek cocks aged 12 weeks, obtained from the results of hatching done by themselves, which had previously been obtained in Tigo Lurah District, Solok Regency. The crickets were obtained from Meris Farm Muaro Paneh, Solok Regency. The Diet used in this study consisted of fine bran, corn, cassava flour, soybean meal, fish meal, and cricket meal, as well as the addition of premix as a feed supplement. The feed ingredients used are shown in table 1, and the composition of the treatment ration on the Table 2.

Table 1. Content of Feed Ingredients Research

feed ingredients	PK (%)	ME (kkal/kg)	Metionin (%)	Lisin (%)	Ca (%)	P (%)
Corn	8,50	3300	0,18	0,20	0,02	0,30
Fine 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 meal	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: 1. Sinurat (2019), 2. Bayu (2014), 3. Saefullah (2006)

Table 2. The composition of the treatment ration

Feeds	P0	P1	P2	P3
		%		
Fine bran	38	38	38	38
Corn	33	33	33	33
Cassava flour	15	15	15	15
Soybean meal	7	7	7	7
Fish meal	6	4	2	0
Cricket Flour	0	2	4	6
Prem0ix	1	1	1	1
Sum	100	100	100	100

Table 3. Content of Treatment Ration

Nutrient content	Amount				Required
	P0	P1	P2	P3	
Crude protein (%)	14,05	14,14	14,23	14,33	14
Energy Metabolism (Kcal/kg)	2815.48	2835,60	2891,80	2930,00	2800-2900
Posphor (%)	0,76	0,72	0,69	0,66	0,40
Calcium (%)	0,71	0,74	0,76	0,78	1,00
Lysin (%)	0,73	0,76	0,78	0,80	0,45
Methionine (%)	0,31	0,30	0,29	0,28	0,21

Note: The results of calculations based on the content of feed ingredients are in Table 1. Ketaren (2010), *Iskandar (2006)

Parameters measured

1. Number of Crowing

The number of crowing was calculated based on the number of crowed syllables minus 3 (three) points (Rusfidra, 2004). The amount of crowing was determined using voice recording; this research was carried out in 2 stages. Phase 1, in the form of voice recording, data retrieval is carried out by recording voice using a digital recording device (IC Digital Voice Recorder) for one period. Stage 2 of voice data analysis, stage 1 of voice data processing using wavosaur software.

2. Crow Duration

The crowing duration was calculated using a digital recorder (IC Digital Voice Recorder) for three days in the last week of the study.

3. Crow Frequency

The frequency of crowing was calculated by counting the number of times the rooster crowed for 24 hours for three consecutive days in the last week of the study.

Maintenance Process.

The males KBC were placed in the clean cage according to the number of treatments, namely three birds per plot, and left for about 1 hour to adjust to the environment. After that, they were given drinking water and treated feed. The feeding in this study was given two times a day, in the morning and the evening. Mixing of rations is done every week so that the rations are not easily damaged.

3. RESULTS AND DISCUSSION

From the results of the study, it was found that the average number of crows the Kokok Balenggek cocks given the addition of cricket flour in the ration, can be seen in Table 4.

Table 5. The average number of crows, duration of crowing, frequency of crowing of chickens

Treatment	number of crowings (Level / 3 days of study))	The average duration of crowing (seconds/crowing / 3 days of study)	Average frequency of crowing (times/day and night / 3 days of study)
P0	$1,5^{bc}$	$1,9^{bc}$	$33,0^{b}$
P1	$2,5^{ac}$	$2,1^{ac}$	$61,6^{b}$
P2	$3,5^{ac}$	$2,3^{ac}$	$117,5^{a}$
P3	$4,5^{a}$	$2,6^{a}$	$126,9^{a}$
SE	0,66	0,16	15,34

Note : Different superscripts show significantly different effects (P<0.05)

The analysis of variance with the addition of cricket flour to the diets gave a significantly different effect (P <0.05) on the number of crowing kokok balenggek cocks for 12 weeks. This is because different levels of cricket flour affect the average number of crowing cocks crowing balenggek cocks.

Based on the DNM RT test, the highest number of crowing was found in P3 (6% used of cricket flour), P2 (4% use of cricket flour), and Pl (2% use of cricket flour); higher than PO (without the addition of cricket flour). The high number of crows at P3, P2, and Pl was due to the protein content in cricket flour. The higher the protein content contained in the feed ingredients, the more crowing cocks crowing balenggek. According to Dloniak dan Deviche (2000), Song production and learning are controlled by an area in the brain called the vocal control region (VCR). VCR work is strongly influenced by the hormone on testosterone, according to Pack (2006). The hormone testosterone plays a role in stimulating the development of secondary sex characteristics that are not directly related to reproduction, one of which is voice. One of the factors that affect the level of hormones in the animal's body is the feed factor; the nutritional content of the feed given, especially the regulation of the balance of the protein metabolism energy content in the rooster's feed, is very important to note.

The feeding, environmental, and genetic factor affects the number of crowing Kokok Balenggek cocks Ahmad et al (1982).

Based on the analysis of variance, the addition of cricket flour had a significantly different effect ($P<0.05$) on the duration of the crowing of the Kokok balenggek cocks for 12 weeks. This is because the different levels of cricket flour affect the duration of the crowing of the Kokok balenggek cock. Based on the DNMR T-test, the highest crowing durations were found in P3 (6% use of cricket flour), P2 (4% use of cricket flour), and Pl (2% use of cricket flour); very significantly ($P<0.01$) higher than the PO (without the use of cricket flour). The high duration of crowing at P3, P2, and Pl is due to the energy and protein content contained in the balenggek crow's ration; the higher the energy and protein content in the feed ingredients, the longer the duration of the balenggek crow's crowing. The results of this study are in line with research Dunington (1990) that the average duration of the crowing of domestic chickens generally ranges from 2-3 seconds.

In general, giving crickets to various types of insectivorous chirping birds (Murai Batu, Poksay, Kacer, and Cucak Rwa) will increase the energy Achmad (2005) stated that the difference in the duration of several types of chickens is influenced by several factors, namely genetics, maintenance, care, health conditions, and the type of feed given.

Based on the analysis of variance with the addition of cricket flour to the ration, it had a very significant effect (P<0,01) on the crowing frequency of the balenggek cock crowing. This is due to the different levels of cricket flour that affect the crowing frequency of the balenggek cock crowing. Based on the DNMRT test, the highest crowing frequency was found in P3 (6% use of cricket flour) and P2 (4% use of cricket flour), very significantly (P<0.01) higher than Pl (2% use of cricket flour); and PO (0% use of cricket flour). In poultry, the sound is produced by the syring or voice box located at the junction between the trachea and the bronchi. In the spring, in birds so that birds can sing louder, faster, and more prolonged. For brooders can improve egg quality (Mu'arif, 2012).

there is a pair of medial tympanic membranes, which vibrate and produce sound when air is passed by during expiration. In most birds, this membrane is a simple organ, but it is a complex membrane in songbirds (Young, 1986). Song production and song learning are controlled by an area in the brain called the vocal control region. The work of the vocal control region is strongly influenced by the hormone on testosterone and the photo period; the physiological response to the length of the day is called the photoperiod. Therefore, the hormonal factors influence the high and low frequency of crowing in IMR. One factor that affects the level of hormones in the animal's body is the feed factor; the nutritional content of the feed given, especially the regulation of the balance of protein metabolic energy content in the feed of roosters, is very important to note

4. CONCLUSION

From the results of the study, it can be concluded that the addition of cricket flour in the ration had a significantly different effect ($P<0.05$) on the number of longans and durations and a very significant difference ($P<0.01$) on the frequency of crowing balenggek chickens at the age of 12-24. weeks with the best number of crowings, duration, and frequency of crowing in P3 (use of 6% cricket flour

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