



Performance Chickens Kedu, Arab and Its Cross Breeds (Poncin) Of Distribution Content Protein Of Growth Fase (Age 0 -12 Week)

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ARTICLE INFO

e-ISSN: 2548-3803

p-ISSN: 2548-5504

Vol. 5, No. 2, December 2020

URL: <https://dx.doi.org/10.31327/chalaza.v5i2.1303>

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Abstract

This experiment shows performance chickens of Kedu, Arab, and Poncin with Giffen different protein content. This experiment uses chickens of Kedu, Arab, and Poncin (a crossbreed of male Arab and female Kedu) that each breed consists of 40 *Day Old Chicken*. Each species was randomly placed in 8 units of experiment cage, and every experiment cage consists of 5 *Day Old Chicken*. Treatment dietary is used 15% (R1) dan 18% (R2). The experiment's design is used a completely random design 2x3 factorial, that i two treatments of dietary and three breeds of chickens. Every treatment is replayed four times, and the show used 24 units of experiment cage. The parameter is limited watch on dietary Consumption, body weight gain, and feed conversion. The result showed that Poncin chickens gave better growth performance when compared to Arab and Kedu chickens. Simultaneously, the ration protein content of 18 % resulted in better growth performance compared to 15% ration protein.

Keywords: chicken Kedu, Arab and Poncin, dietary protein

A. Introduction

Local chickens, which are livestock plasma germs in Indonesia, need to be maintained, conserved, and increased in productivity so that the community can utilize this source of wealth. The local chicken existence during the community, especially in the countryside, has been going on for hundreds of years. However, the level of change related to productivity is still very low compared to purebred chicken, but when viewed from an economic perspective, such as the price and efficiency of ration use is even higher. This condition has encouraged those who care about local chicken farms to look for other local chickens whose growth is better for optimal productivity.

Kedu chicken is one of the superior local livestock whose existence in Indonesia is still very limited. However, this chicken has attracted attention because it has good vitality and fast growth compared to other local chickens. More importantly, this chicken is one of the germplasm of livestock in Indonesia, whose existence needs to be preserved. Kedu chicken can be a pure breed of chicken in Indonesia because it has adapted to the local environment for a long time. If a targeted and planned breeding program is carried out, it will help obtain genetically superior seeds. The results are expected to become a national asset for the foreseeable future.

In addition to Kedu chickens, some time ago, Arab chickens were also known, which have become the new prima donna for dual-purpose types of chickens (broilers and layers) egg growth and production than other local chickens. This condition is new hope for small farmers in rural areas today. It is supported by the government's program to establish a breeding center to find superior local types of chickens. Breeding Arab chickens are very profitable. Therefore any government program to promote local chickens is almost always synonymous with developing Arab chickens.

Poncin Chicken is a chicken that results from a cross between a male Arab chicken and a female Kedu chicken. This crossed chicken will produce high productivity and efficiency if supported by a feeding program following its growth. Crosses will change the need for nutrients, which is manifested in the phases of the feeding program. Optimal growth is obtained when the food substances are sufficient for growth following the chicken's genetic ability. Feeding the following growth can increase feed efficiency and reduce feed costs. To achieve this, information on the protein requirements of the three types of local chickens (Kedu, Arab, and Poncin) is needed for each growth phase.

Protein is an essential nutrient for the body of livestock. Protein that is not produced in the body of livestock must be supplied through feed ingredients. The protein source feed ingredients provided must also contain complete and balanced amino acids to be more efficient. Most of the protein source feed ingredients used as poultry feed are conventional feed such as soybean meal, fish meal, Meat Bone Meal (MBM), Poultry Meat Meal (PMM), which is quite expensive, so its provision must be appropriate to reduce feed costs. The protein consumed will be synthesized into amino acids and used to form meat so that bodyweight will increase. Bodyweight gain is closely related to protein intake in livestock. Some factors influence protein intake. The factors were Protein consumption and protein digestibility. The higher the protein consumption and protein digestibility, the higher the protein intake in the livestock body, but the high protein consumption will cause a low-efficiency ratio of protein use (Kingoriet *al.*, 2003). The protein efficiency ratio will show livestock's coefficient level to convert each gram of protein consumed into body weight gain (Situmorang *et al.*, 2013).

Ration protein content has a significant effect on growth speed. Chickens with genetic characteristics overgrow; if sufficient protein rations do not support them, they will experience growth retardation. On the other hand, chickens with slow-growing genetic traits but are supported by high protein rations are less efficient because more protein will be wasted. Dozier *et al.* (2008) stated that the need for amino acids is influenced by genetics. In connection with this, providing a ration with protein that suits the need is a requirement for profitable growth. However, there has not been many types of research on the essentials for a feed until now. Especially regarding the protein requirements for Kedu, Arabian chickens, and the results of their crosses (Poncin), not much has been done, either related to their biological characteristics or their genotypes. Based on the preceding, the authors are interested in examining local chickens' performance, especially Kedu, Arabic, and their crosses (Poncin), which are given different ration protein content in the growth phase of 0-12 weeks of ages.

B. Methodology

1. Materials of Research

The experiment used 120 local chickens aged 1 (one) day without distinguishing sex (Unsexed). Consisting of 3 (three) types of chickens, namely Kedu chicken, Arabic chicken, and Poncin chicken (the results of the crossing of Kedu Females and Male Arabs), respectively - each consists of 40 animals. Each type of chicken received two ration treatments with four replications, and each repetition consisted of 5 (five) chickens. The average initial body weight was 32.8 grams. And a coefficient of variation of 9.85%. The ration ingredients consist of fine bran, yellow corn, fish meal, coconut cake, soybean meal, coconut cake, grit, coconut oil, and top mix. The research ration consisted of ratios with 15% protein content and ratios with 18% protein content.

Table 1. Composition of Research Ration

No	Food Substance	Treatment Ration	
		R1	R2
		 %	
1	Fine bran	60	59
2	Yellow Corn	13.5	10.5
3	Coconut Cake	9	7
4	Soybean meal	6	11
5	Fish flour	7	9
6	Grit	2	1.5
7	Coconut oil	2	1.5
8	Top Mix	0.5	0.5

Table 2. Content of Food Substances, Energy Metabolism, and Amino Acid Research Ration.

No	Food Substance	Treatment Ration	
		R1	R2
1	Crude protein (%)	15.37	18.03
2	Coarse Fat (%)	7.58	6.55
3	Rough fiber (%)	4.26	3.60
4	Calcium (%)	1.38	1.36
5	Phosphorus (%)	0.52	0.51
6	Methionin (%)	0.34	0.35
7	Lysin (%)	0.89	0.87
8	EM (kkl/kg)	2942.85	2948.65

2. Procedure of Research

The cage used is a 'cage' system whose skeleton is made of wood. Other cage equipment is Ohaus brand balance scales with capacities of 310 and 2610 grams with an accuracy of 0.01 and 0.05 for weighing DOC and weighing chicken body weight every weekend. To consider the ration and the rest of the ration, a 5 kg capacity scale is used with a precision level of 1 gram. Aluminum plates are used as identification numbers, hygrometers to measure room humidity (percent), places to eat and drink, and measuring cups.

To prevent New Castle, Disease is done through vaccination. The type of vaccine used is Medevac ND Lasota Prodion Medion Bandung-Indonesia, which is given three times during the study, namely at the age of 4 days through eye drops and at the period of 18 and 30 days through drinking water. To reduce stress, Vitachick is used. The gift is made when the chicken has just arrived and after taking measurements every week.

Handling of newly arrived chicks is done by giving sugar water to return the body to its original state. Next, the one-day-old chicks are weighed initially and given an identification number on the wings. Each cage unit was also numbered according to the randomization of the treatment and repetition using shaken pieces of paper and then randomly. Placement of chickens into cage units is also done randomly.

Experimental rations with different protein contents (15 percent and 18 percent) were given to experimental chickens on an ad-libitum basis. Every time a ration is attempted, no one is scattered. For the first five days, food is spread on the surface of newspapers placed on the cage floor to teach chicks to know food. Besides that, a particular food place for chicks is also provided, along with the provision of rations, drinking water is also provided.

3. Parameters of Research

The parameters measured in this study were;

- 1) Ration consumption. The ration consumption was measured once a week by calculating the difference between the ration given at the beginning of the week and the remaining ration remaining in the following week in grams, then adding up to obtain the ration consumption data study. To calculate ration consumption has used the formula:
Ration consumption (grams) = ration given (grams) - remaining ration (grams)
- 2) Increase in Body Weight (grams). Measured every week calculated based on the difference in the final bodyweight of the study with the initial body weight of the study divided by the length of the study lasts (grams/week)
- 3) Feed Conversion. The calculation of feed conversion is based on the quotient between the amount of ration consumed (grams) and weight gain in the growth period (grams). Nugraha *et al.* (2017).
- 4) They are supporting Variable Measurement. The cage's environment temperature (°C) and humidity (percent) were measured every day at 06.00, 12.00, 18.00, and 21.00. The pens (°C) are calculated using a room thermometer hung on the cage pole, and air humidity (percent) is measured using a hygrometer also placed on the cage pole.

4. Data Analysis

The design used was a Completely Randomized Design (CRD) of 3x2 factorial pattern with four replications; each repetition used an experimental unit of 5 chickens. The main factor is the type of chicken that consists of Kedu chicken, Arabic chicken, and Poncin chicken. The second factor is the protein content of rations, comprised of 15 percent and 18 percent. The mathematical model is:

$$Y_{ijk} = \mu + A_i + B_j + (AB)_{ij} + \varepsilon_{ijk}$$

Information:

Y_{ijk} = The performance of the three types of chicken with different protein ration contents

μ = General average value

J_i = Effect of type treatment additives to -i

R_j = Effect of ration treatment additives to -j

JR_{ij} = Interaction between types to -i and rations to -j

ε_{ijk} = Error

C. Result and Discussion

1 Effect of Treatment on Consumption of Rations

The results of measurements of ration consumption during the study of each treatment are shown in Table 3.

Table 3. Average Ration Consumption of Three Types of Chicken Contained Different Protein Rensum Content

Factor A Chicken Type	Factor B Protein Type		Average
	Protein 15 %	Protein 18 %	
	gram/tail.....		
Kedu	3651.78	3423.88	3537.83 ^b
Arab	3735.61	3468.17	3601.89 ^{ab}
Poncin	3737.45	3746.76	3742.10 ^a
Average	3546.27 ^b	3708.28 ^a	3627.27

Note: Different letters to the column indicate a significant difference at the 5% significance level

Table 3 shows that the average ration consumption for Poncin chickens was higher, followed by Arabian chicken ration consumption, and the lowest was for Kedu chickens. Simultaneously, the average ration consumption of the three types of chicken with ration protein content was 18% higher than the protein content of 15%. Variety analysis was carried out to determine the effect of different types of chicken and protein content on ration consumption.

The variance analysis results showed no interaction between the type of chicken and the ration's protein content. However, the types of chicken and the ration's protein content had a significant effect ($P < 0.05$) on ration consumption. It found out the difference between the

treatment of chicken types on ration consumption, followed by Duncan's Multiple Range Test, the results of which were listed in table 3.

Duncan's Multiple Range Test results showed that the average ration consumption between Poncin chickens and Arabian chickens showed no difference. There may be a similarity in characteristics between the mother and the offspring; in this case, the crop distribution in Poncin chickens and Arab chickens is likely to be the same. The amount of feed consumption obtained from this study is not significantly different. The same thing was found in the average ration consumption between Arab chickens and Kedu chickens, which did not show a difference due to the possibility of similarity in the two parents' characteristics in terms of crop distribution in these two types of chicken. Another case is the average ration consumption between Poncin chicken and Kedu chicken, where the average Consumption of Poncin chicken ration is higher ($P < 0.05$) compared to Kedu chicken. The high ration consumption in Poncin chickens was due to the more considerable crop distance in Poncin chickens so that the ration consumption obtained was higher. If it is related to genetic traits, then this is possible by the presence of positive heterosis. It is by the opinion of Falconer(1981), which states that crossbreeding aims to form heterosis to improve offspring. Other, crossbreeding also aims to combine the different traits possessed by the group selected as parents to be passed on to their offspring. Furthermore, Hardjosubroto & Atmojo (1994) stated that if the body of cruciferous livestock becomes more significant, the need for feed for basic needs will also increase. Again, to find out the difference between the ration's protein content, it was followed by Duncan's Multiple Range Test as listed in table3.

Duncan's Multiple Range Test results in Table 3 show that the ration consumption of chickens with a ration protein content of 18 percent was significantly higher ($P < 0.05$) than that of chickens with 15 percent protein content. This situation occurs because of the different ration arrangements, resulting in different ration palatability. It is known that in the treatment of 15 percent ration protein (R1), the animal protein source is lower than that of 18 percent (R2). The amount of animal protein in the ration that originates from the fish meal will, within a certain limit, reduce the ration's palatability, which in turn reduces the ration consumption. In studies where the animal protein in the percentage decreased by 2 percent (from 9 percent to 7 percent), ration consumption decreased significantly ($P < 0.05$). It happens because, within certain limits, the chicken can distinguish the smell and taste of the ration it eats so that the ratio that is not liked will be consumed less (Appleby, 1992). Furthermore, Kartasudjana (2001) explained that by reducing animal protein from the fish meal by 2 percent (from 9 percent to 7 percent) in native chicken rations, it could reduce ration consumption. Thus, reducing the number of animal protein sources in the ratios to a certain extent will reduce ration consumption.

2 Effect of Treatment on Increased Body Weight

To measure growth can be done by measuring body weight gain by weighing chickens every week. The average results of measurements of body weight gain from each treatment are shown in Table 4.

Table 4. Average Body Weight Gain of the Three Types of Chickens Given Different Protein Rations

Faktor A Chicken Type	Factor B Protein Type		Average
	Protein 15 %	Protein 18 %	
	gram/tail.....		
Kedu	945.05	1065.26	1005.16 ^c
Arab	980.25	1188.65	1084.45 ^b
Poncin	1092.29	1219.64	1155.96 ^a
Average	1005.86 ^b	1157.85 ^a	108.86

Note: Different letters to the column indicate a significant difference at the 5% significance level

Table 4 shows that the highest average body weight gain was obtained for poncin chickens, then for Arabic chickens, and the lowest for Kedu chickens. Simultaneously, the average ration consumption of the three types of chicken to the ration protein content was 18% higher than the protein content of 15%. Variance analysis was carried out to determine the effect of chicken species and ration protein content on body weight gain.

The results of the analysis of variance showed that there was no interaction between types of chicken and the protein content of the ration. However, chicken kind has a significant effect on body weight gain and protein content. Furthermore, to find out the difference between the treatment of chicken types on body weight gain, it continued with Duncan's multiple distance test, the results of which are listed in table 4.

The results of Duncan's Multiple Range Test in Table 8 show that the body weight gain of Poncin Chickens was significantly higher ($P < 0.05$) compared to the body weight gain of Arabian and Kedu Chickens. The increased body weight gain in poncin chickens compared to Arabian and Kedu chickens means that the crossbreed chickens are superior to their parents in producing body weight. If it is related to the ration consumption for each type of chicken, it turns out that the Consumption of Poncin chicken is higher than that of Arabian chicken and Kedu chicken (Table 4). High ration consumption will result in higher body weight gain.

This study's results follow the opinion of Noor (2000), which states that if the livestock does not have a crossbreed family relationship, the offspring tend to perform better than the average performance of their parents for specific traits. Furthermore, heterosis exists if the average performance of the crossed cattle exceeds the average of its parents. The ration consumption between Kedu chicken and Arabic chicken is also different (table 4) due to differences in each chicken's biological ability to digest and absorb food to result from another body weight gain. Following Falconer's (1981) opinion, it is following that each chicken's ability to produce different body weight is due to the indirect effect of gene traits related to the body's physiological influence on the feed given. It found out the difference between ration protein treatment on body weight gain, it was followed by Duncan's Multiple Range test, the results of which are listed in table 4.

Duncan's Multiple Range Test results in Table 4 show that the body weight gain in chickens fed with 18 percent mature protein content was significantly higher ($P < 0.05$) compared to the body weight gain in chickens with 15% ration protein content. The increased body weight gain obtained at the ration protein content of 18% was due to the amount of ration consumed was more than the amount of ratio consumed at the ration protein content of 15%. It indicates that there is a close relationship between livestock growth and ration consumption. Thus one of the factors that influence growth is the amount and content of food consumed. This study's results are in line with the research results by Sidadong (2009), which states that for feed that meets quality based on the need for growth, feed consumption will be adjusted to differences in feed protein-energy concentration. A higher feed concentration will consume a lower feed and vice versa.

High Consumption of rations at high protein content results in high Consumption of ration protein. The ration's high protein content results in more protein in the body, so that that this situation can cause high body weight gain. This study is in accordance with Scott et al. (1982) and Wahyu (1992), which states that high body weight gain can be achieved through improved rations, especially ration protein must be met according to needs. Furthermore, Suryana *et al.* (2014) added that the higher the ration consumption, the higher the chicken protein consumption, so the amino acid deposition in the tissue would increase so that growth could be better. It is recommended that rations with low protein and are consumed in small amounts cause a deficiency or imbalance of amino acids, thus causing the elimination of the amino acid concentration pattern from the pattern required by the body and followed by slow growth.

3 Effect of Treatment on Feed Conversion

Average ration conversion research results from each treatment are listed in table 5.

Tabel5. Mean Ration Conversion of the Three Types of Chicken that were Given Different Protein Ration Content

Faktor A Chicken Type	Factor B Protein Type		Average
	Protein 15 %	Protein 18 %	
	gram/tail.....		
Kedu	3.868	3.219	3.543 ^b
Arab	3.822	2.919	3.370 ^{ab}
Poncin	3.431	3.082	3,256 ^a
Average	3,707 ^b	3,073 ^a	3,390

Note: Different letters to the column indicate a significant difference at the 5% significance level

Table 5 shows that the average ration conversions from the lowest to the highest were produced by Poncin chickens, Arab chickens, and Kedu chickens, respectively. Meanwhile, the averages conversion of a ration with a protein content of 18% was higher than that of 15%. Variance analysis was performed to determine the effect of differences in chicken species and ration protein content on ration conversion.

The variance analysis results showed no interaction between the type of chicken and the ration's protein content on the ration conversion. However, the type of chicken and the ration's protein content had a significant effect ($P < 0.05$) on ration conversion. It found out the difference between chickens' treatment to the ration conversion, Duncan's multiple distance test followed it.

The Duncan Multiple Range test results in Table 5 show that the conversion of Poncin chicken ration is not significantly different from that of Arabic chicken. Likewise, the Arabic chicken and Kedu chicken. The ration conversion of Poncin chicken was significantly lower than that of Kedu chicken. It happens because the weight gain achieved is higher in Poncin chickens, followed by high ration consumption. Therefore, when viewed from the balance of body weight produced by the ration spent, it is no different. It means that Poncin chickens are more efficient in using ratios than the other two types of chicken.

Ration conversions need to be considered because they have substantial economic value for the benefit of breeders. The smaller the ratio conversion value produced, the better its ability to increase its body weight, and the more efficient its use. Furthermore, to determine the difference between ripe protein treatments on ration conversion, it was followed by Duncan's Multiple Range Test.

Duncan's Multiple Range Test results in Table 5 show that the conversion of rations with a protein content of 15% was significantly higher ($P < 0.05$) than the conversion of ratios in chickens with 18% protein content. It was that protein has affectation conversion, where the addition of protein in the ration will decrease the ratio's conversion. Sutama (1991) states that the ration conversion of native chickens with protein provision is 16 percent greater than 18% protein. Wizna (1992) said that the conversion of native chicken ration in the highest growth period was achieved by giving 12% protein ration, namely 4.40, then decreasing with an increase in the provision of ripe protein 14.5 percent of 3.13 and a diet with 17 percent protein yielded a conversion value of only 2.76.

Lacy and Vest (2000) in Fahrudin (2017) stated that some of the main factors influencing ration conversion are genetics, quality of rations, disease, temperature, cage sanitation, ventilation, medication, and cage management. The rationing factor also plays a role in influencing ration conversion, the rate of travel of the ration in the digestive tract, the physical form of the ratio, and its nutritional composition.

Rasyaf (1994) argues that the smaller the ration conversion means that rations' provision is more efficient, but there has been a waste if the ration conversion increases. According to Anggorodi (1985), ration conversion is influenced by factors such as the age of the livestock, nation, nutritional content of the ration, temperature and livestock conditions, good management, and seeds.

D. Conclusion

There was no interaction between chicken species and ration protein content on ration consumption, body weight gain, and growth phase ration conversion of 0-12 weeks. There is an effect of chicken type on ration consumption. It can be seen in the Consumption of poncin chicken rations ($P < 0.05$) compared to Kedu chickens. In contrast, the ration consumption of Poncin chicken and Arabic chicken is not different. The same goes for Arabic and Kedu chickens. Furthermore, the body weight gain of Poncin chickens was higher ($P < 0.05$) compared to Arab chickens and Kedu chickens. In comparison, the body weight gain of Arab chickens was also higher ($P < 0.05$) than Kedu chickens. The ratio conversion of Poncin and Arab chickens was not significantly different. When compared between poncin chicken and Kedu, it turns out that the conversion of Poncin chicken ratio is lower ($P < 0.05$). The ration protein content of 18% indicated ration consumption and body weight gain, and ration conversion had a significantly higher effect ($P < 0.05$) than the dietary protein content of 15%.

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