Feed Consumption, Average Daily Gain and Feed Conversion of Broiler Chicken with Different Feed

Nuraini¹, Astriana Napirah¹, Harapin Hafid¹, Firman Nasiu¹, Restu Libriani¹, Yamin Yaddi¹, Elfia¹ and S.H. Ananda²

¹Department of Animal Science, Universitas Halu Oleo Southeast Sulawesi, Indonesia
²Department of Nutrition, STIKES Karya Kesehatan Southeast Sulawesi, Indonesia

Email: harapin.hafid@uho.ac.id

Abstract. This study aims to determine the growth performance of broiler chickens given three different types of commercial feed. This study uses its own formulated feed, Bravo BP-11 commercial feed, and BR-1 commercial feed. This study used as many as 90 chickens with different sexes. The study used a completely randomized design with six replications. The variables studied consisted of feed consumption, body weight gain, and feed conversion. The results showed that artificial and commercial feed types had a significant effect (P <0.05) on feed consumption, body weight gain and feed conversion. It was concluded that commercial feed types (BP-11 Bravo and BR-1) gave a better response to feed consumption (98.05 g Vs 98.06 g), body weight gain (63.10 g Vs 59.59 g) and feed conversion (1.57 Vs 1.66).

Keyword: Broiler, commercial feed, feed consumption, average daily gain, feed conversion

1. Introduction
It is undeniable the advancement of the world of poultry in the country, especially in broiler breeding farms, commonly called broiler chickens. Broiler chickens are one of the livestock used to meet the demand for meat from the community.

Factors that need to be considered in livestock business are how to get fast growth. Animal growth is strongly influenced by genetics and environment which consists of nutrition or feed factors, livestock age, health level, housing, temperature and humidity, and management [1]. The quality and quantity of feed provided will affect the growth of livestock. Quality and continuous feeds will have a good influence on the speed of livestock growth [2].

Especially for broiler farms, the variety of types of feed on the market gives farmers the choice to choose the type of feed that is suitable for livestock that is maintained by considering the environmental conditions of the maintenance to produce optimal production. Two types of commercial feed sold and circulated to farmers in Kendari City are BP-11 Bravo feed and BR-1 feed. These two types of feed have not yet known which type of feed is suitable for regional conditions, especially Kendari City to produce a higher body weight. Based on the description above, it is considered necessary to research the growth performance of broilers with different feeds.

2. Materials and Research Methods
The material used in this study was 95 broiler chickens with mixed-sex. The feed used in the study was treated as a bravo BP-11 commercial feed produced by PT. Charoen Pokphan Indonesia Tbk.,
BR-1 commercial feed produced by PT. Perkasa Agung Sejati Indonesia and its formula feed consisting of a mixture of yellow corn, rice bran, and 24 AA RK concentrate. The food composition of the research feed and the formula feed composition itself (PFS) given to broiler chickens are presented in Table 1 and Table 2.

Table 1. Composition of research feed ingredients

| Feed Consumption | B1 | B2 | B3 |
|------------------|----|----|----|
| Protein          | 22.3 | 21 – 23 | 21 |
| Fat              | 6.1  | 5  | 5 |
| Rough Fiber      | 4.0  | 5  | 5 |
| Calcium          | 5.03 | 0.9 | 0.9 – 1.1 |
| Phosphor         | 0.67 | 0.6 | 0.7 – 0.9 |
| ME               | 3089.5 | 3050 | 3342 |

Table 2. Own formula feed composition (PFS) given to broiler chickens

| Feed ingredients   | Percentage (%) | Nutrient content |
|--------------------|----------------|------------------|
|                    |                | EM (Kkal/kg)     |
| Konsentrat RK 24 AA| 50             | 1374.95          |
| Corn               | 35             | 1217.83          |
| Rice Bran          | 15             | 370.58           |
| Total              | 100            | 2963.36          |

This study was designed using a completely randomized design with 3 replications. The treatment consisted of different types of broiler chicken feed, namely P1 was the formula feed (PFS), P2 was BP-11 Bravo, and P3 was BR-1.

The variables that will be observed in this study are:
1. Feed consumption is obtained by reducing the amount of feed given with the remainder every week divided by 7.
2. Bodyweight gain (UN) is the rate of weight gain weighed every week.
3. Feed conversion was obtained from the amount of feed consumption (g / head/day) on average divided by body weight gain (g / head/day) on average each week during the study.

Data were analyzed statistically by using factorial randomized complete design (RAL) analysis using Mattjik and Sumertajaya [3]. If there are significant differences (P <0.05) between treatments, then the analysis is continued with the Duncan Mattjik and Sumertajaya multiple distance tests [3].

3. Results and Discussion

Livestock growth performance can be measured through parameters of feed consumption, body weight gain and feed conversion [4][5][6]. The average feed consumption, body weight gain and feed conversion during the study period are presented in Table 3 below.

Table 3. Average feed consumption, body weight gain and feed conversion during the study period

| Variable                          | Treatment*                  |
|-----------------------------------|-----------------------------|
|                                   | PFS (B1) | BP-11 (B2) | BR-1 (B3) |
| Feed Consumption (g/ekor/hari),   | 88.33±11.27 b                | 98.05±18.52a | 98.06±21.50a |
| Body Weight Addition (g/ekor/hari), | 36.44±5.01b          | 63.10±15.90 a | 59.59±17.52 a |
| Feed Conversion                   | 2.48±0.60 a                | 1.57±0.69 a | 1.66±0.85 a |
3.1 Feed consumption
The results of the variance analysis showed that the type of feed had a significant effect (P <0.05) on feed consumption. The results of further test analysis showed that the average formulated feed consumption (PFS) was significantly lower when compared to commercial feed (BP-11 Bravo and BR-1), but the commercial feed of BP-11 Bravo and BR-1 were not significantly different. This shows that commercial feed (BP-11 Bravo and BR-1) is more palatable than PFS. Consumption differences are suspected because BR-1 feed and BP-11 Bravo feed are commercial feeds whose nutritional content is in accordance with the requirements for chicken growth. As stated by Sondakh, et al. that commercial feed is a mixture of several ingredients that have been prepared in such a way with certain formulations to meet the needs of livestock [7].

Low PFS feed consumption is suspected because of the level of chicken palatability to feed form. PFS feed given in this study is in the form of a mixture of mash and crumble so that it is less favored by chickens, while the commercial feed given in this study is in the form of crumble so that the use is preferred by chickens. Broiler chickens prefer to consume feed in the form of crumble (granules) than feed in the form of mash (flour). As stated by Widianingsih that feeding in broiler chickens should be consumed or utilized by the livestock body so that feed use is more efficient [8]. North and Bell [9]; Widianingsih states that there are three types of broiler chicken feed, namely mash, crumble, and pellet. Giving feed in the form of the mash is usually inefficient because many are scattered, so broiler chicken feed is generally given in the form of crumble or pellet so that its use is more efficient.

3.2 Weight gain
The results of the analysis of variance showed that the type of feed had a significant effect (P <0.05) on body weight gain. The results of further test analysis showed that the average increase in PFS feed weight was significantly lower when compared to commercial feed (BP-11 Bravo and BR-1), but the commercial BP-11 Bravo feed and BR-1 commercial feed were not significantly different. The high body weight gain in commercial feeding shows that both BP-11 Bravo and BR-1 commercial feed have met the nutritional requirements for the growth of broiler chickens.

In giving PFS feed the body weight gain is low, possibly caused by the nutrient content of the feed not meeting the needs for the growth of broiler chickens. As Indarto said that to achieve good growth of broiler production, the feed provided must be perfect and sufficient in the sense that the feed given must contain all the food substances needed by the body with good quality in amounts as needed [7][10]. Wahju added that the growth process requires energy and the substance of cell or tissue compilation obtained by livestock through the food consumed [11].

3.3 Feed Conversion.
The results of the variance analysis showed that the type of ration had a significant effect (P <0.05) on feed conversion. The results of further test analysis showed that the average PFS feed conversion was significantly higher when compared to the average commercial feed conversion (BP-11 Bravo and BR-1), but the average commercial BP-11 Bravo and BR-1 feed conversion was not significantly different. This difference in feed conversion is thought to be due to differences in broiler chicken response to the type of feed given. Amrullah stated that the main factors that influence feed conversion are genetics, temperature, ventilation, sanitation, feed quality, type of feed, use of additives, water quality, disease and treatment, and maintenance management [12].

4. Conclusion
It can be concluded that the type of feed has a significant effect (P <0.05) on feed consumption, body weight gain, and feed conversion. Types of commercial feed (BP-11 Bravo and BR-1) provide a better response than the formula feed (PFS) for feed consumption, body weight gain and feed conversion.
References

[1] Hafid, H. 2011. Pengantar evaluasi karkas. Cetakan Pertama. Unhalu Press, Kendari.
[2] Hafid, H., Rahman, Nuraini, Y. Wati, Inderawati, S.H. Ananda and L. Ba’a. 2018. Production of broiler chicken carcass fed on rice bran biomass on different marketed ages. IOP Conf. Series: Earth and Environmental Science 209: 1–9.
[3] Mattjik, A. H. dan Sumertajaya. I. M. 2013. Perancangan Percobaan dengan Aplikasi SAS dan Minitab. IPB Press, Bogor.
[4] Hafid H. 1998. Kinerja produksi sapi Australian Commercial Cross yang dipelihara secara feedlot dengan kondisi bakalan dan lama penggemukan berbeda [tesis]. Bogor: Program Pascasarjana. Institut Pertanian Bogor.
[5] Hafid, H. dan R Priyanto. 2006. Pertumbuhan dan distribusi potongan komersial karkas sapi australian commercial cross dan brahman cross hasil penggemukan.. Media Peternakan 29 (2), 63–69.
[6] Hafid, H., R.E. Gurmadi, R. Priyanto, and A. Saefuddin. 2010. identifications of carcass characteristics for estimating the composition of the beef carcass. J.Indonesian Trop.Annal. Agric. 35(1) : 22-26.
[7] Sondakh, E. I, M Najoan, L Tangkau, dan W Utiah, 2015. Pengaruh tiga macam ransum komersial dan sistem alas kandang yang berbeda terhadap performance ayam pedaging. Fakultas Peternakan Universitas Sam Ratulangi, Manado. Jurnal Zootek. 35 (1) : 10 – 20.
[8] Widianingsih, M. N., 2008. Persentase Organ Dalam Broiler yang Diberi Ransum Crumble Berpernak Onggok, Bentonit dan Tapioka. Skripsi. Program Studi Ilmu Nutrisi dan Makanan Ternak Fakultas Peternakan Institut Pertanian Bogor. Bogor.
[9] North, M. O. dan D. D. Bell, 1990. Commercial Chicken Production Manual. 4th Edition. Van Nostrand Rein Hold, New York.
[10] Indarto, N., 2010. Sukses dan Untung Besar Beternak Ayam Broiler. Lumine Books. Yogyakarta.
[11] Wahju, J., 2004. Ilmu Nutrisi Unggas. Edisi Keempat. Universitas Gadjah Mada Press, Yogyakarta.
[12] Amrullah, I.K., 2004. Nutrisi Ayam Broiler. Cetakan Kedua. Lembaga Satu Gunung Budi. Bogor.