

Evaluation of Local Feed in Broiler Diets in Small Scale Farm in Palu Central Sulawesi¹⁾

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ABSTRACTS: Feed is the basic component that plays an important role in poultry industry. The cost of feed were taken more high cost than other aspects. Poultry feed companies are required to provide feed at a cheaper price with the use of local feed ingredients as a base feedstuffs in the preparation of the diets formula. Besides, feed manufacturers also are expected to produce good quality feed at affordable prices. The main objective of this research was to evaluate the use of diets by used local feedstuff as an ingredients of base material feed on growth performance, feed efficiency, and carcass yield of broiler chickens. The experiment was conducted in small scale farm in Pengawu Tatanga District Palu Central Sulawesi. The experiment was used 360 day old chicks (DOC) broiler strain CP 909. That chicks was reared in small scale farm with divided in two blocks treatment i.e. treatment with applied local feed (block 1) and treatment with applied commercial feed (block 2) as a control diets. Each treatment was used 180 chicks that placed in 6 plots stages with 30 chicks for each plot and its were reared up to 5 weeks old. Observed variable were growth performance (body weigh, gain, feed intake, and feed conversion ratio), feed efficiency (efficiency utilization of feed, income over feed and chick cost), carcass yields (carcass dressed, carcass components, abdominal fat pad). Data were calculated and analyzed by t-test in SPSS 17 program. Results of the experiment was shown no significant effects on growth performance (body weight, gain, feed intake, feed conversion ratio), feed efficiency, and carcass yields. However, the treatment was affected significantly different ($P < 0.05$) on slaughter weigh and wings components parts. Influenced also in highly significant ($P < 0.01$) different on abdominal fat and income over feed and chick cost of the two treatments. The use of local feed as a basic ingredients of ration in broiler small scale farm resulted relatively the same response with the use of commercial diets. An excess of use local feed is more cheaper than commercial diets, available all years needed, and increasing income farmer as a results of a declined the feed prices.

Keywords: broiler, carcass, feed efficiency, growth performance, local feed

INTRODUCTION

Feed is one of the basic components of the poultry farm industry that play an important role to produce animal protein. About two-third production cost is feed. The increase price of feed stuffs often becomes a problem. There is an alternative methods to solve that problem by using the local feedstuffs in that area. The use of local feed ingredients as a poultry feed still facing the problem of varying quality nutrients and the presence of harmful contaminants such as mycotoxins contamination. To overcome this problem needed the right technology to increase the value of nutrients and reduce the effects toxic effects. Application of the technology associated with the availability of feed technology that is easy, cheaper and can be adopted by users.

Feed manufacturers are expected to produce good quality feed with the low prices. Feed development policy geared to the provision of feed (feed security) and improving the quality of feed (feed safety) based on local resources. It means that the farmers can produced their own

animal feed without depending on imported materials. This can be realized by taking the 3 main strategies to reduce dependence imported feed ingredients, ensure the safety and quality of feed, improve the development of feed science and technology to the local feed processing (Agus, 2011). In the future, farmers should be able to utilize local feedstuffs as an alternative feed sources that is more profitable farm business. Cheap source of feed that can be obtained by utilizing a wide variety of agricultural wastes, plantation, home industry and other materials potentially.

This study aimed to evaluate the use of basic feed ration with local feedstuffs compared with commercial feed fed on the growth, feed efficiency, income over feed and chick cost, and carcasses yield.

METHODS

Research has been conducted in Pengawu Village, District of Tatanga Palu, Central Sulawesi Indonesia. Implementation of this experiment was evaluated in March 15 to November 9, 2013. It were used 360 DOC broilers strain CP 909 as animal experiment. The experiment was applied two treatments as a local feed ingredient (LD) and commercial feed concentrate as control diets (CD). Diets and water were given ad libitum.

Feed ingredients used are locally available raw feedstuffs in the city of Palu, such as corn, soybeans, rice bran, fish meal, minerals, vitamins and amino acids. Feed manufacturers are used for comparison produced by Charoen Pokphan as call BR1 concentrate.

Supporting equipment used is the feed mill, mixer (mixing machine weft), digital scales, where food, drinking water, brooder, water reservoirs, modified pipes, pumping water dap, plastic buckets etc.. Cage experiment used as 24 plots slat base with a height of 1 m from the ground. At the bottom of the enclosure to accommodate a given pedestal stool chaff that fell to the floor. Each unit of plots by walls made of wire ram.

This study was designed to use two treatment groups: the group using the feed manufacturers and local groups who have been using formulated feed with the same protein content (isoprotein) and iso-energy. Starter ration composition formula contents with 23.46% protein and metabolizable energy 3090 kcal/kg, while the finisher ration formula with a protein content of 21.46% and 3034 kcal metabolizable energy/kg (NRC, 1994). The composition of the ration of local diets listed in Table 1 and commercial diets (CD) shown in Table 2.

Table 1. Composition of feed used as a basic formula of the local diets (LD)

No.	Feedstuffs	Feed Composition (%)	
		Starter	Finisher
1.	Corn milled	50	51
2.	Rice bran	11	11
3.	Soyabean milled	17	16
4.	Fish meal	18	14
5.	Tofu waste	3	7
6.	Mineral mix	1	1
	Total	100	100
	Protein, %	23.26	21.41
	Fat, %	6.49	6.56
	Crude Fiber, %	4.01	4.75
	ME, kkal/kg	3148	3170

Table 2. Composition of feed used as a basic formula of the commercial diets (CD)

No.	Feedstuffs	Feed Composition (%)	
		Starter	Finisher
1.	Corn milled	0	15
2.	Concentrate BR1	100	85
	Total	100	100
	Protein, %	23.50	21.33
	Fat, %	5.00	4.86
	Crude Fiber, %	3.00	2.88
	ME, kkal/kg	3000	3054

At the end of the experiment, two chicken for each plot were weight individually prior to slaughter. After slaughter, feather were removed by dipping the chicken in to the warm water (app. 60-70 °C). Carcass yield was weight of the dead chicken without feathers, head, neck, legs, and digestive organs. The chickens were cut in to the parts according to the standard procedure of dissection (Jensen, 1989).

Variables Observed

Variables determined were growth performance (weigh gain, feed intake, feed conversion rasio) and carcass yields (slaughter weight, carcass percentage, carcass component (breast meat, drumstick, tight, back, wings), and abdominal fat pad, economic value of ration (feed efficiency, income over feed and chick cost) Abdominal fat can be defined as the fat surrounding the gizzard and lay between the abdominal muscles and the intestines.

Data Analyzis

Data for all variables were subjected to analyzed by using t-test in SPSS 17 (Supardi, 2013; Hanafiah, 2005).

RESULTS AND DISCUSSION

Growth Performance

The effects of the treatment on the average value of growth performance i.e. body weight, gain, feed consumption, feed conversion as shown in Table 3.

Table 3. Average body weight, gain, feed intake, feed conversion rasio during the experiment

Growth Performance	Treatments		<i>t-test value</i>
	LD	CD	
Body weight, g	1551.67±160.55	1612.50±88.59	0.120 ^{ns}
Weight gain, g	1515.77±159.57	1577.83±86.46	0.216 ^{ns}
Feed intake, g	3776.63±43.97	3821.66±69.33	0.119 ^{ns}
Feed conversion rasio, g/g	2.46±0.25	2.38±0.12	0.255 ^{ns}

note: ^{ns} Non significant different from the two treatments (LD and CD) with *Confidence Level* 95% LD = Local diets; CD= Commercial diets

Results of *t-test value* was shown no significant effects ($P > 0.05$) on body weight, gain, feed intake, feed conversion ratio during the experiment. This gives an indication that the use of local feed ingredients in broiler ration has relatively the same quality with commercial feed sold in the market. The real body weight resulted from the experiment as slightly different with the $CD = 1612.50 \pm 88.59$ (commercial diets based) and $LD = 1551.67 \pm 160.55$ (local diets based). This is probably caused by the nutrient content of the ration consumed relatively similar, although different base materials. Palatability of feed ingredients is one of the factors that determine the level of household consumption in livestock rations. Amrullah (2003) stated that the palatability of the ration influenced by the shape, smell, taste, and texture of the feed.

Although did not show statistically significant but generally treated with a commercial feed showed body weight gain propensity score is higher. This is consistent with feed consumption values are relatively higher. North and Bell (1990) found that an increase in body weight gain is influenced by feed consumption, if consumption of both the body weight gain would also be good. Rombe (2012) states that the factors that influence weight gain is feed consumption. This opinion is also supported by Ichwan (2003) which states that the overall weight gain is influenced by the amount of feed intake and nutrient content contained in the feed.

In feed conversion ratio also did not found differences between the two treatments. This is caused by the feed intake and weight gain between treatments was also not significantly different. Means the use of local feed ingredients in the ration formulation can still cause biological benefits compared to commercial ration.

Feed conversion ratio is a reflection of the ability of animal to utilize rations consumed to produce body weight. The low value of the feed conversion ratio will not provide high gain if not supported by the high body weight gain. Pachkam (1981), found that the lower the number the more efficient feed conversion ratio in use. Another experiment was found that the weight gain and feed conversion ratio of broiler on 6 weeks old fed by local feed as 1501-1722 g and 1.69-2.02 (Winanto, 2014), 1206-1455 g and 2.43 (Harmanto, 2013), 1407-2159 g and 1.76-2.05 (Trisnayanti, 2014). Further experiment was done by Olugbemi *et al.* (2010), reported that there is a positive correlation between feed intake and weight gain, the increasing in feed conversion value means that the feed consumed were not efficient in conversion feed to meats or eggs in poultry farm.

Carcass Yield

The effects of the treatment on the carcass yield that consist of slaughter weight, carcass, component carcass, and abdominal fat as shown in Table 3.

Table 3. Average slaughter weight, carcass, component carcass, and abdominal fat of broiler at 5 weeks old

Carcass Production	Treatments		<i>t-test value</i>
	LD	CD	
Slaughter weight, g	1391.67 ± 208.37	1791.67 ± 195.08	0.012*
Carcass, %	72.04 ± 4.63	71.39 ± 1.66	0.377 ^{ns}
Components of Carcass :			
- Breast meat, %	33.16 ± 1.47	33.35 ± 1.50	0.418 ^{ns}
- Wings, %	11.27 ± 0.59	10.55 ± 0.37	0.017*
- Back, %	19.83 ± 0.43	20.89 ± 1.81	0.115 ^{ns}
- Drumstick + Thigh, %	27.10 ± 2.30	26.92 ± 1.77	0.438 ^{ns}
Abdominal fat, %	0.65 ± 0.18	1.20 ± 0.29	0.002**

Note: ^{ns} Non significant different of the two treatments (LD and CD) with Confidence Level 95%
 * Significant different (P<0.05) of the two treatments (LD and CD)
 ** Hight significant different (P< 0.01) of the two treatments (PL and PK)
 LD = Local diets; CD= Commercial diets

Results of *t-test value* was shown significant effects (P<0.05) on slaughter weight and wings percentage of the broiler at 5 weeks old and shown high significant effects (P<0.01) on abdominal fat. However in carcass percentage, breast meat, back, drumstick and thigh were resulted in no significant effects. This gives an indication that the production of carcass resulting from the use of local feed ingredients in broiler ration has relatively the same quality with commercial diets. Carcass yield was found in this experiment as 72,04 ± 4,63 (LD) and 71.39 ± 1.66 (CD), this results more higher compared to Sarjuni (2011) that found 68.28-71.42%, 67.30-69.90% (Muiz, 2014), and 70.44-74.13% (Yadav and Sah, 2005).

Economic Value of the Ration

The means of economic value of the ration i.e feed efficiency, income over feed and chick cost as shown in Table 4.

Table 4. Averages of economic value of the ration i.e feed efficiency, income over feed and chick cost during 5 weeks old

Economic Value	Treatments		<i>t-test value</i>
	LD	CD	
Feed efficiency	0.411 ± 0.043	0.422 ± 0.024	0.297 ^{ns}
Income over feed & chicks cost	0.340 ± 0.08	0.147 ± 0.030	0.0097 ^{**}

Note: ^{ns} Non significant different of the two treatments (LD and CD) with Confidence Level 95%
 ** Hight significant different (P< 0.01) of the two treatments (LD and CD)
 LD = Local diets; CD= Commercial diets

Economic value of ration based on t-test analisis was found no significant different in feed efficiency, however in income over feed and chicks cost was shown high significant different (P<0.01) of the two treatments (LD and CD). This means that the use of local feed ingredients in broiler ration formulation gives a positive result, can lower the price of ration and produce value income over feed and chick cost greater. Rasyaf (2005) which stated that the efficiency of feed use will reduce the cost of feed elements occupy the highest expenditure of the cost of production. The improvement in income over feed cost could be attributed to the decreased feed intake and feed cost (Yadav and Sah, 2005).

Funk and Frank (2008) states that a decision needs to be taken in addressing the pricing of feed ingredients that are needed by farmers. On the other hand, Joseph (2004) was found an effort to improve the success of broiler maintenance in addition to inexpensive materials that can also be through the addition of feed supplements to the ration. When rations are used not provide good efficiency it is advisable to provide additional supplements to the diet can be beneficial in order IOFCC (Rombe, M.B. 2012). Whenever, Luis *et al.*, (2004) can be managed to improve the efficiency of feed and IOFCC through the addition of protease supplements.

CONCLUSION

The results of this experiment show that the positive effect of used the local feed in broilers diets and provide the performance results that do not differ significantly in body weight, feed

intake, feed conversion, and carcass production but significantly different in slaughter weight and wing pieces. Whenever, showed high significant effect to reduced abdominal fat pad. Evaluation of local feed prices lower than 26.63% compared to commercial feed. Future research in this area should focus on the attempt to give compidence of farmer in small scale farm to use of local feed in diets formulation of broiler.

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