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Utilization of Cattle Waste for Replaced Rice Bran on Native Chicken Feed to Reduce Feed Convertion Ratio (FCR)

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ABSTRACT

The main problem faced by laying chicken breeders is the rising price of food consistently while the price of eggs tends to be stable and often decreases. To anticipate this condition it is needed to be a breakthrough in overcoming the feed issues, especially bran. Utilization of cattle waste as livestock feed has been done by several people, but the product given is in the form which has not been processed or just dried it. Cattle fermented livestock wastes as poultry feed is expected to reduce feed costs incurred. The research was conducted in Jehem village, Tembuku District of Bangli Regency used laying hen as many as 250 tails divided into 5 treatments namely (P0) control = as usual standard feed ; P1: bran replaced by 5% livestock waste; P2: bran replaced by 10% of livestock waste; P3: P1 + probiotic Bio L 2 cc/litre of drinking water and P4: P2 + probiotic Bio L 2 cc/litre of drinking water. The average egg production after 180 days of production was 105.8 (P0), 109.1 (P1), 102.6 (P2), 106.3 (P3) and 108 grains (P4), those treatments were not significantly different (P> 0.05). Also Henday's results (%) where P0; P1; P2; P3 and P4 yield 58.79; 60,60; 56.98; 59.05 and 59.57%, respectively and among those treatments were not significantly different (P> 0.05). While FCR for P0 is (77,52); P1: (79,60); P2: (78,45); P3: (73.75) and P4: (74.45) gr/head, and between P3 and P4 had a lower FCR (P <0.05) when it is compared to the FCR of P0's treatment, P1 and P2. This means the use of Bio L probiotics can reduce the consumption of feed (FCR), and the use of livestock waste up to 10% as a substitute of bran does not affect productivity.
Key Words : native chicken, cattle waste, productivity, feed conversion ratio

INTRODUCTION

Native chicken have been longtime aslivestock that is maintained by the community, especially in the transition and rural areas. This is because there is much utilization of domestic poultry. Bisides eggs and meat native chicken is also used as ceremonial needs by the Balinese people. Currently in Bali there are 4,009,849 heads populatioan of poultry and 662,239 head ducks (Disnakkeswan, 2015), and egg production each, domestic poultry 3,019 tons and ducks 4,180 tons (Disnakkeswan, 2012). Thus the contribution of poultry and duck to meet the needs of meat and eggs in Bali is quite high.

One of the obstacles in the development of chicken and duck farming is the factor of feed. Feed is the highest cost component of poultry farms including poultry livestock, and the limited availability of some feed ingredients, so some still have to import (Sinurat, 1999).

Therefore it is worth trying to utilize several types of local materials, including cow feces. According to Saddat Nasution and Adrizal (2009), the use of rations with protein levels

between 14% and 17% and the energy content of 2,220 up to 2,720 kcal / kg did not cause significant differences in egg weight, thickness of the shell, egg index and yolk color. The research result of BPTP-Bali research in 2013 showed that cow feces that has been processed through fermentation can be utilized in domestic poultry rations up to 15%, without any significant effect on egg productivity, although the energy content of ration is lower (Guntoro et al., 2013). In order to the use of processed cow feces in laying poultry ration level can be increased and to suppress the FCR (Feed Covertion Ratio) number it is necessary to try the application with a combination of probiotics.

Poultry has limitations in digesting crude fiber (Rev. 1992). The decrease in the crude fiber content of a substance, provides an opportunity to increase the level of use of the material in poultry rations, including domestic poultry or native chickens. If the research of cow feces utilization for substitution of some of these domestic chicken ration components succeeds, it will be able to increase profits of domestic chicken and increase the economic value of cattle waste. Previous research has shown that the fermentation of cow feces with inoculants containing microbes from the digestive tract of termites can increase the level of feces protein from 6% to 9%. While the use of processed cattle feces up to 15% in the ration, no effect on egg productivity, while the use of cow feces up to 20% level causes the decrease in egg production. However, economically the use of cow feces up to 20% in the ration is still profitable. To improve technological effectiveness and efficiency economically, the improvement in fermentation technique, and combination of probiotic usage in drinking water. With the use of probiotics is expected to decrease FCR (Feed Convertion Ratio) in other words the use of feed will be more efficient.

MATERIALS METHODS

Location and Time

Livestock waste processing and rationing trials are conducted in Jehem village, Tembuku sub district of Bangli.

Method

a. Cattle waste processing

Fresh cow feces are fermented using inoculants containing several types of microbes from the digestive tract of termites that can produce cellulolitic and proteolytic enzymes. Fermentation is carried out in *an aerob* for 5 days, then the waste dried in the sun then milled to form a flour.

b. Making rations

The ration made of laying native chicken ration (layer), with 4 (four) levels of processed cow's waste, i.e 0%, 10%, and 15%. In addition, there are 2 types of rations again in the same level of the use of cow feces, respectively plus the use of probiotics (Bio-L) 2 cc per liter of drinking water. Cow feces flour after being mixed with other concentrate ingredients, is given directly in the form of mash (flour). Proximate analysis is done to determine the nutritional content in the ration material and ration of livestock are made. This activity was conducted at the Livestock Research Center - Ciawi, Bogor. The elements analyzed include protein, crude fiber, fat, calcium, phosphorus and energy metabolism.

c. Treatment Methods

A total of 200 laying native chicken aged 6 - 7 months are kept in breeder's battery cage. The battery cage is divided into 5 groups each containing 40 tails. Each treatment consists of 4

(four) replicates, and each repeat cage plot contains 10 laying native chicken. The 5 groups of laying native chicken, each given the feed treatment as follows:

P0 = Ration according to farmer formula (without cow feces flour).
P1 = Ration given as in P0 with the use of 5% cow feces flour as a material substitution.
P2 = Rations given like P0 using 10% cow feces flour as material substitution.
P3 = Chicken given rations such as P1 and added probiotic Bio L 2cc / liter
P4 = As in P2 rations and added probiotics Bio L: 2 cc / liter of drinking water.

d. Data analysis

Parameters observed include (1) egg production (Hen day), (2) egg weight, (3) feed consumption, (4) FCR (Feed Conversion Ratio). The research study used a completely randomized design with 5 treatments and 4 replications each. The data were processed by variance analysis with error rate of 5% (P <5%). If the variance test indicates a significant difference, then the test between the two treatments is tested "Duncant Multiple test". (Steel and Torrie 1991).

RESULTS AND DISCUSSION

Each rationschemical analysis was conducted at the laboratory of Livestock Research Center, Ciawi, Bogor. The result of the "proximate analysis" ration (P0, P1, and P2) are presented in Table 1. For P3 rations, P4 is the same composition, respectively with P0, P1, and P2. Different treatment on P3 and P4, only on the provision of probiotics (Bio-L), 2 cc per liter of drinking water every day each.

Table 1. Chemical Composition of Rations Provided in Free-range Chicken

No	Treatment	Composition (%)					
		CP	Fat	CF	Ca	P	Total energy (K.cal/kg)
1	P0	16,30	8,39	7,73	1,60	0,65	3.760
2	P1	17,05	5,90	7,40	2,79	0,66	3.694
3	P2	16,76	6,53	8,25	2,67	0,62	3.767

Source : Laboratory of livestock research centerBogor

The result of proximate analysis shows that the higher the level of cow feces usage cause the level of fat in the ration decreases. This is because the content of fat in cow feces is lower than in rice bran. Therefore, the higher the substitution of bran ingredients by the waste of processed cattle, cause the lower the fat content in the ration. In contrast, the content of protein and crude fiber in the processed cow feces is higher than the same rice bran substance, so the feed composition in the ration tends to increase, with the higher use of processed cow feces. Prior to this study, analysis of various fermentation time ranges on cow manure has been conducted. Where the best time is 5 days with the result DM: 95.07; CP: 14,80; Fat: 0.73; CF: 32.77; BETN: 33.10 and Total energy (K.cal/kg): 3.539. Fermentation results 5 days better than 7 days where the CP only reached 13.30. In the fermentation of 7 days, the protein content actually decreases, because over the time some proteins have undergone mineralization process (become N) and some have *immobilized*, where proteins are absorbed by microbes, then they form the cell wall in the form of Chitin, so it is difficult to disentangle (Rosmarkam and Yuwono 2002). The raw form of cow feces contains about 8.3% protein and BETN 18.8% (Junaidi and Irfan 1997). It seems that the type of cow and the composition of the feed given also affects the feces composition. As reported by Nurcholis and Yunus (2000) on *sludge* (solid waste biogas)

from cow feces which contains crude protein of 11.46%, crude fiber 18.84%, fat 2.15% and BETN 22.53%.

Egg Productivity

As seen from the result obtained on the substitution of cow fermented livestock given on poultry feed, the average production during the 180 days production period at P0, P1, P2, P3 and P4 each 105.8; 109.1; 102.6; 105.1 and 108 grains / tails. With Henday from each treatment (P0, P1, P2, P3 and P4) was 58.79; 60,60; 56.98; 58.41 and 60.00%.

Table 2. Productivity of Free-range Chicken eggs which Given the Treatment of Feed from Waste (Feces) Processed Cow (per tail per 180 days)

No	Parameter	P0	P1	P2	P3	P4
1	Average production (butir/ekor)	105,8[a]	109,1 [a]	102,6 [a]	105,1 [a]	108[a]
2	Hen day (%)	58,79 [a]	60,60 [a]	56,98 [a]	58,41 [a]	60,00[a]
3	Egg weight(gr/egg)	44,3[a]	44,7[a]	44,8[a]	44,9[a]	46,0[ab]

Information : Different letters in the same column are significantly different (P <0.05)

Egg weight resulting from the 5 treatments. Where P0, which is given standard feed while P1 and P2 fed with a mixture of fermented wastes yields an egg weight of 44.3; 44.7 and 44.8 grams / grains. As for P3 and P4 that added probiotics showed higher egg weight. From each treatment did not show any significant difference (P <0.05) between treatments. This shows that feeding with a mixture of fermented cow waste up to 15% does not affect production. From these data shows that the use of processed cow feces up to 15% level does not cause a decrease in egg productivity. This can be due to the addition of fermented wastes to 15% has no really much effect on the nutritional content needed in production. As the requirement of protein around 17% (Table 1), as what was delivered by Husmaini (2000) that the requirement of chicken protein in the growth period of 8 weeks reaches 17% with metabolic energy 2900 – 3100.

Similarly, the use of probiotics has no significant effect on egg productivity even though it shows an increase number. This is probably because the whole chicken is still in "peak production" status (above 50%). Guntoro, at al. (2000) states that the use of probiotics and enzymes in chicken has more visible influence in line with decrease rate in egg production (Guntoro et al, 2000). The use of cow feces for cattle feed has been studied for a long time, among others, by Anthony (1971) where the substitution of 40 parts of the concentrate with cow feces that has been heated does not cause the cow growth significantly decreased, whereas if cow feces is administered in a raw state (unheated) Causing a significant reduction in body weight gain. While Nurcholis and Yunus (2000) stated that the use of *sludge* from cow feces can be used as a rabbit feed mixer up to 40% of the total concentrate.

FCR (Feed Convertion Ratio)

FCR is the ratio between the weight of the feed consumed and the weight of production (egg). Thus the FCR gets better when the number is smaller, because it means the use of ration is more efficient. Before the research took place,farmers usually provide feed with the system of

"restriction", where chicken fed with the same size everyday, ie ± 75 grams / head / day. In this study, feeding was done *ad-libitum* (no limitation) to be able to measure feed intake from each treatment optimally.

The consumption data obtained after the 180-year study showed that P0 consumed an average of 78.52 grams / head / day and 79.52 respectively; 78.45; 73.75 and 74.73 grams / head / day respectively for P1, P2, P3 and P4. For daily consumption doesnot show major difference but if done in a long time (180 days) it will appear that the consumption rate of treatment P3 and P4 are 13,275 and 13,451 grams / head and significantly lower (P <0.05) than the level of consumption treatment P0, P1 and P2 reaching 14,133; 14,313 and 14,121 grams / head. From the existing feed consumption data, showed that the use of cow feces in the ration did not significantly affect the consumption of feed. But probiotics cause a significant decrease in feed intake (P≤0,5), this may be because of probiotics are microorganisms that live in foods which have beneficial effects in the body by improving the balance of micro-organisms in the digestive tract (Guntoro, et al. 2008).

Table 3. FCR Chicken In Each Treatment

No	Treatment	Weight of Chicken (gram/head)	Feed Consumption (gram/head/180 days)	Egg Production (gram/head/180 days)	FCR
1	P0	1192	14.133[a]	4.686	3,01[a]
2	P1	1164	14.313[a]	4.872	2,94[a]
3	P2	1210	14.121[a]	4.596	3,07[a]
4	P3	1224	13.275[b]	4.719	2,81[b]
5	P4	1187	13.451[b]	4.968	2,70[b]

Information : Different letters in the same column show significant difference (P <0.05)

Further, Kompiang (2009) explains that probiotics are living microbes or spores that can live or grow in the intestine and can benefit their host either directly or indirectly from the metabolic yield of the substrate can alter the intestinal microecology in such a way that beneficial microbes can breed well. Probiotics are also known able to produce digestive enzymes such as amylases, proteases and lipases that can increase the digestive enzyme concentration of the host's digestive tract so as to improve nutrient overhaul.

CONCLUSIONS

Provision of fermented cattle livestock up to 15% in laying poultry ration does not affect the productivity, and the provision of Bio L Probiotics in domestic poultry can reduce the level of feed consumption.Further research is needed to find a more effective and efficient way of fermentation.

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