Growth and Blood Profile of *Lepus Nigricollis* Fed Diet Fermented Coffee Skin in Different Levels

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**Abstract**

The research objective was to know growth and profile of blood of local rabbit (*Lepus nigricollis*) fed fermented coffee skin in different levels. There were 80 animals used in the research; the design used was Randomized Block Design with five treatments and eight blocks (replicates). Treatments used in the research were a diet without coffee skin called diet control (R0), 10% coffee skin (R1), 20% coffee skin (R2), 10% fermented coffee skin (R3) and 20% fermented coffee skin (R4). Results of the research showed that erythrocyte and hematocrit of the animals fed diet R3 were better (P < 0.05) than R4, R2, R1, and R0. There were no significant different (P < 0.05) among treatments R0, R1, R2, R3 and R4 to leucocytes of the female animals. Blood cholesterol of the animals fed diet R4 was the lowest (P < 0.05) than other treatments. The animals fed diet R3 resulted in feed consumption, final body weight (on the age of 17 weeks) and weight gain higher (P < 0.05) than R4, R2, R1, and R0. The different levels of coffee skin used in the research were not affect significantly feed conversion value. It could be concluded that growth rate and profile of blood of the female animals fed 10% fermented coffee skin were better than other treatments.

**Keywords**

Blood profile; Coffee skin; Growth rate; *Lepus nigricollis*; Local female rabbit;

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1. Introduction

Target to reach animal protein self of Indonesia society in the year of 2014 will facing obstacle if only base on big ruminant (cattle and buffalo) and owning small area and period of production is long-term (Mastika, 2011). Rabbit development is one of the solution to reach acceleration animal protein of the society particularly village society due to the animals need not much area, and capital is small relatively (Nuriyasa et al., 2015). Unsuccessful of farmers for developing rabbit farming is due to farmers knowledge about feed nutrition is still low (Nuriyasa et al., 2016). Using of coffee skin as feed can increase it value. Bio-fermented coffee skin can increases nutritive value of the matter and digestibility coefficient, to help to minimize gas of glass house and to make the farm becomes unpolluted environment (Dubey, 2007).

Availability of coffee skin for 4118.24 ton/ha (in Bali) as an ingredient of the animals feed is very potent. Trough fermentation process with Aspergillus niger the protein content of coffee skin can be increased from 9.94% to 17.81%, crude fiber content decreased from 18.74% to13.05% (Lestari et al., 2005). Studied of Parwati et al. (2008) reported that coffee skin-fermented with Aspergillus niger could replace rice bran that was used as a concentrate to feed cattle. Research results of Muryanrtho et al. (2006) reported that utilization of 5% coffee skin was not affected to the performance of endogenous chicken. Gontoro (2004) recommended that level utilization of coffee skin powder for pig and chicken feeds were 10 to 15%. There is no much information yet about the use of fermented coffee skin in research particularly mature female rabbit.

2. Research Method

Rabbit
There were 80 local female rabbits with initial weight for 258.50 g per head used in the research.

Animal Pen
The research used 40 battery pens where length = 70 cm, wide = 50 cm and height = 45 cm each (Sceire, 1999). The height of the pens was 70 cm above the ground.

Feed and Drinking Water
The feed used in the research was composed of some ingredients, i.e., yellow corn, fish mill, rice bran, coconut milk, soybean mill, elephant grass, tapioca mill, coffee skin, fermented coffee skin, coconut oil, and bone mill. Diet fed was same level energy content (2,500 kcal/kg) and same level crude protein content (16%). Drinking water was originally from the water around the pens. Feed and drinking water fed ad libitum

Blood Profile
The observation was conducted only once at the end of the research on the age of the animals was 17 weeks. The animals fasted for 12 hours before blood samples were taken. The blood was taken for six cc on the ear of each animal with a project where it tube was lined with anticoagulant, i.e. lithium heparin (Xiangmei, 2008).

Growth
Feed and water consumption were calculated once a week where the amount of feed offered to the animals minus the rest at that day. Weighed of body weight was conducted once a week to obtain weight gain. Feed conversion ratio (FCR) was calculated with a comparison between total feed consumed and weight gain during the research.

Data Analysis
Obtained data were analyzed with ANOVA; if it is significantly differences among treatments, the analysis would be continued with Duncan’s Multiple Range Test (Steel and Torrie, 1980).
3. Results and Analysis

Table 1 showed that blood of the animals fed diet R3 contained hemoglobin, erythrocyte, and hematocrit higher (P < 0.05) than the R4, R2, R1, and R0. McNitt (1996) reported that hemoglobin, erythrocyte, and hematocrit of blood are the transportation of oxygen in body tissue that needs in metabolism process. The animals fed R3 resulted in the highest weight gain. Nuriyasa et al. (2014) reported that high growth rate level as result of energy retention and high protein caused the process of hemoglobin, erythrocyte, and hematocrit formed in blood are higher. There was no significant different (P > 0.05) to leukocyte content of the local male animals blood fed R0, R1, R2, R3, and R4. Leukocyte content of the animals fed R0, R1, R2, R3, and R4 were 6.74 x 10^3 /μl, 6.11 x 10^3 /μl, 6.03 x 10^3 /μl, 5.98 x 10^3 /μl dan R4 7.12 x 10^3 /μl respectively. This showed that the animal fed diet with different levels of coffee skin was no significant difference in stress. This was similar to work of Alhaidary et al. (2010) who found that leukocyte content of the animal blood was about 6.3 to 10 x 10^3 /μl.

### Table 1

Blood Profile of Local Female Rabbit Fed Diet in Different Levels of Coffee Skin

| Variable                  | Treatment        |
|---------------------------|------------------|
|                           | R0   | R1   | R2   | R3   | R4   | SEM  |
| **Hematology Variables**  |      |      |      |      |      |      |
| Hemoglobin (g/100 dl)     | 11.43b | 10.98c | 11.78b | 12.85a | 12.05a | 0.09 |
| Leukocyte (10^3 /μl)      | 6.74a  | 6.11a  | 6.03a  | 5.98a  | 7.12a  | 0.36 |
| Erythrocyte (10^6 /μl)    | 5.57b  | 5.07c  | 5.44b  | 5.84a  | 5.65a  | 0.02 |
| Hematocryte (%)           | 37.69b | 36.14c | 37.97b | 40.58a | 38.02b | 0.17 |
| Cholesterol (mg/100 dl)   | 131.33a | 133.05a | 133.17a | 120.12ab | 88.64b | 3.06 |

**Description:**
- R0 : diet without coffee skin
- R1 : Diet with 10% unfermented coffee skin
- R2 : Diet with 20% unfermented coffee skin
- R3 : Diet with 10% fermented coffee skin
- R4 : Diet with 20% fermented coffee skin

The same super scrip in the same rows is no significant different (P > 0.05) but, the different super scrip in the same rows is significantly different (P < 0.05).

SEM: Standard Error of The Treatment Means

### Table 2

Performance and Carcass of Rabbit Fed Diet with Different Levels of Coffee Skin

| Variable                | Treatments        |
|-------------------------|-------------------|
|                         | R0   | R1   | R2   | R3   | R4   | SEM  |
| **Performance and Carcass Variable** |      |      |      |      |      |      |
| Final body weight (g)   | 1744.52b | 1730.13b | 1735.37b | 1878.45a | 1745.71b | 11.74 |
| Feed consumption (g/day)| 76.39c  | 79.63b  | 83.47b  | 80.63b  | 86.55a  | 43.46 |

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**Weight gain (g/day)** | 21.47<sup>b</sup> | 21.32<sup>b</sup> | 21.03<sup>b</sup> | 22.99<sup>a</sup> | 21.01<sup>b</sup> | 11.15
---|---|---|---|---|---|---
**Feed conversion** | 3.56<sup>b</sup> | 3.73<sup>b</sup> | 3.96<sup>a</sup> | 3.51<sup>b</sup> | 4.12<sup>a</sup> | 0.03

Description:
R0 : diet without coffee skin
R1 : Diet with 10% unfermented coffee skin
R2 : Diet with 20% unfermented coffee skin
R3 : Diet with 10% fermented coffee skin
R4 : Diet with 20% fermented coffee skin

The same super scrip in the same rows is no significant different (P > 0.05) but, the different super scrip in the same rows is significantly different (P < 0.05).

**SEM**: Standard Error of the Treatment Means.

**4. Conclusion**
Cholesterol in the animals blood fed diet R4 was lower (P > 0.05) than the R3 cholesterol that absorbed in the intestine is also decreased (*Alhaidary et al., 2010*). The animal fed diet R3 rich final body weight and weight gain higher (P < 0.05) than the R4, R2, R1, and R0. This was due to bio-fermentation process in ingredients of diet that could increase its nutritive value (*Dubey, 2007*). According to *Krisnan (2002)* that *Aspergillus niger* could decrease tannin content for 33%, so it could increase feed consumption and energy metabolic significantly. Feed conversion value on the animals fed diet R3 was higher (P < 0.05) compare to others. The animals fed 10% fermented coffee skin showed that hematology, performance, and carcass better response than others.

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**Biography of Author**

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| 1986               | S1      | Faculty of Animal Science | Animal Nutrition |
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| 2012               | S3      | Udayana University | Animal Science |

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1. I Made Nuriyasa; I Made Mastika, I Gede Mahardika, I Wayan Kasa. 2012. Temperature Humidity Index and Physiological Responses of Local Rabbit Offered Different Level of Energy and Protein Feeds and Housed in Two Cage Systems. *E-Journal Animal Science*. Vol. (1): 1-9
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| Year | Paper Presenter | Topic | Committee |
|------|-----------------|-------|-----------|
| 2014 | Gusti Ayu Mayani Kristina Dewi, I Made Mudita, I Made Nuriyasa, I Wayan Wijana | The Effect of Biosuplement Probiotic Product For Slaughter Weight, Carcass Weight, Carcass Percentage, Physical, Composition and Meat Quality of Bali Duck | Asia Future Conference, Diversity & Harmony. Inna Grand Bali Beach Hotel & Udayana University |
| 2014 | Gusti Ayu Mayani Kristina Dewi, I Made Mudita, I Made Nuriyasa, I Wayan Wijana | The Effect of Inclusion of Bio-Supplement as Probiotic in Diet on the Productivity of Bali Duck | The 16th AAAP Congress, Gajah Mada University, Yogy Karta, Indonesia |

| Year | Activity |
|------|----------|
| 2012 | The increase of rabbit productivity through microclimate revision of shelter and diet quality at Riang Kelod Village, Tabanan Regency |
| 2012 | Introducing of rabbit diet in the form of pallet on rabbit farming at Dajan Peken Village, Tabanan Regency |
| 2013 | The revision of goat farming management through chocolate fruit waste at Pupuan District, Tabanan Regency |
| 2014 | Introducing of coffee skin as rabbit fed at Riang Gede Village, Tabanan Regency. |
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I certify that all the information in Curriculum Vitae is true and if there is a mistake, I am willing to account for it. Indonesia, 5th January 2018

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