



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



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Article history: Received 8 June 2017, Accepted in revised form 3 January 2018, Approved 5 February 2018,
Available online 10 February 2018

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Keywords

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

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.

e-ISSN : 2550-6986, p-ISSN : 2550-6994 © Copyright 2018. The Author.

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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% to 13.05% (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 Muryantho *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 $6,74 \times 10^3/\mu\text{l}$, $6,11 \times 10^3/\mu\text{l}$, $6,03 \times 10^3/\mu\text{l}$, $5,98 \times 10^3/\mu\text{l}$ dan $7,12 \times 10^3/\mu\text{l}$ 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 $10 \times 10^3/\mu\text{l}$.

Table 1
Blood Profile of Local Female Rabbit Fed Diet in Different Levels of Coffee Skin

Variable	Treatment					SEM
	R0	R1	R2	R3	R4	
Hematology Variables						
Hemoglobin (g/100 dl)	11,43 ^b	10,98 ^c	11,78 ^b	12,85 ^a	12,05 ^a	0,09
Leukocyte ($10^3/\mu\text{l}$)	6,74 ^a	6,11 ^a	6,03 ^a	5,98 ^a	7,12 ^a	0,36
Erythrocyte ($10^6/\mu\text{l}$)	5,57 ^b	5,07 ^c	5,44 ^b	5,84 ^a	5,65 ^a	0,02
Hematocryte (%)	37,69 ^b	36,14 ^c	37,97 ^b	40,58 ^a	38,02 ^b	0,17
Cholesterol (mg/100 dl)	131,33 ^a	133,05 ^a	133,17 ^a	120,12 ^{ab}	88,64 ^b	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					SEM
	R0	R1	R2	R3	R4	
Performance and Carcass Variable						
Final body weight (g)	1744,52 ^b	1730,13 ^b	1735,37 ^b	1878,45 ^a	1745,71 ^b	11,74
Feed consumption (g/day)	76,39 ^c	79,63 ^b	83,47 ^b	80,63 ^b	86,55 ^a	43,46

Weight gain (g/day)	21,47 ^b	21,32 ^b	21,03 ^b	22,99 ^a	21,01 ^b	11,15
Feed conversion	3,56 ^b	3,73 ^b	3,96 ^a	3,51 ^b	4,12 ^a	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.

Acknowledgements

The authors would like to thank Government of Indonesia through Department Research and Public Service of Udayana University for their budget supported through Study Program Research Scheme. Thanks also to the Rector of Udayana. University. The Dean of Faculty of Animal Science Udayana University for their facilities research supported.

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Biography of Author



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Educational Background

Year of Graduation	Stratum	Faculty and University	Departement
1986	S1	Faculty of Animal Science	Animal Nutrition
1991	S2	Institute of Agriculture (IPB) Bogor, Indonesia	Animal Nutrition
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Publication Paper

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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Paper Presenter

Year	Topic	Committee
2014	Gusti Ayu Mayani Kristina Dewi, I Made Mudita, I Made Nuriyasa , I Wayan Wijana. The Effect of Biosupplement 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 16 th AAAP Congress, Gajah Mada University, Yogya Karta, Indonesia

Public Service Activity

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.
2015	Management revision of pig farming at Cau Belayu Village, Tabanan, Regency
2016	To make pig diet formulation at Cau Belayu Village, Tabanan Regency

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



I Made Nuriyasa