International Journal of Multidisciplinary Approach and Studies
ISSN NO:: 2348 – 537X

Performance and Carcass of Local Male Rabbit Fed Basal Diets of Native Grasses and Different Levels Suplementation of MNB

A.W. Puger*, & I.M. Nuriyasa**

Faculty of Animal Science Udayana University, Denpasar

ABSTRACT

A research about performance and carcass of local male Rabbit fed Mineral Nutrition Block (MNB) on basal diet of native grasses was conducted at Dajan Peken Village, Tabanan District, Tabanan Regency (50 m above sea level). Design used in the research was Randomized Block Design, 4 treatments and 5 replicates. Treatment in this research were Rabbit fed control diet i.e. native grasses without MNB supplementation (R0), control diet supplemented with 15 g/head/day MNB (R1), control diet supplemented with 15 g/head/day MNB (R1), control diet supplemented with 30 g/head/day MNB (R2), control diet supplemented with 45 g/head/day MNB (R3). Diet and drinking water offered ad-libitum. Results of the research showed that diet consumption, end live weight and weight gain per day of the animals treated R3 were higher (P < 0.05) than the R2, R1 and R0 (Control). The animal treated R3 resulted diet conversion lower (P < 0.05) than that R2, R1 and R0. No significant difference (P > 0.05) on variable carcass percentage, physical carcass composition (meat and bone) among treatments. Treatment R3 resulted carcass weight and carcass length higher (P < 0.05) than that R2, R1 and R0. It can be concluded that performance and carcass local male Rabbit fed basal native grasses supplemented with 45 g MNB per day were higher than that fed 30, 15 and without the supplementation.

KEY WORDS: *native grasses, MNB, performance and carcass*

INTRODUCTION

Rabbit development estate in society was conducted since long time ago but, amount of farmers and its population are still very low. From the animal point of view, that is potential to develop it as sources of good quality meat in shorter time instead of large ruminant (cattle). According to Nuriyasa *et al.* (2015) that rabbit-breeding needs smaller infestation and smaller area than ruminant. He also said that target for self supporting animal protein in Indonesia society would face obstacle if it base on meat production of large ruminants only. Schiere (1999) stated that development of rabbit-breeding would give big enough opportunity in order to fulfill public nutrition because the animal has some superiority i.e. (1) produces high meat quality, (2) agriculture and kitchen waste products can be used as it feed, (3) by products of the animals (skin and its hairs, head, leg, tail, urine and feces) can be used for many needs.

Fields realities showed that most of farmers fed the animal with native grasses only, and only few of them fed concentrate such as waste product of tofu, rice bran or mixed both of them. Farmers never weigh and account nutrients concentration in concentrates. This condition often causes farmers loss of their material due to animal mortality (Nuriyasa, 2016). Up to know, one of the farmers weakness is knowledge of diet quality particularly understanding about protein, energy and minerals (Suttle, 2010). Although minerals are needed in small amount but, they have importance functions in animal body metabolism. Their functions are: (1) to form body organs, (2) physiological function, (3) to catalyze functions of enzyme, (4) to replicate and break down sells. Farmers fed sesame diet to all physiology status of animals. Quantity and quality of diet are never pay good attention by farmers and they fed them with what is available at that time. To rear Rabbit such that system, farmers are often disappointed due to many cubs death or cannibalism. Xiccato *et al*. (1999) said that nutrient balance in diet is the most importance on productivity of the animal. According to Blass and Wiseman (1998) that protein, carbohydrate, fat, vitamin and water are needed indeed by the Rabbit. Study results of Salma (2004) found that pregnancy percentage of Rabbit fed diet with protein content of 21% higher than 16.64, and 13.17 % resulted pregnancy for 100, 60 and 49 % respectively. Gestation period was not influence by protein content of diet but, amount cubs delivery where their weight were higher on the animals fed diet with higher protein content of 21 and 16.64 % than the protein content of 13.17%.

The objectives of the research were to increase performance and carcass local Rabbit trough MNB supplementation on basal diet of native grasses.

MATERIALS AND METHOD

Rabbit

The research used local male Rabbits (*Lepus nigricollis*) with initial body weight mean of 600.00 ± 96.5 g. It was held at Dajan Peken Village, Tabanan District, Tabanan Regency (50 m above sea level) for 3 months.

Shelter

The research used 20 pen battery shelters with size of 70 cm length, 50 cm wide and 45 cm height each (Sceire, 1999). Height of the pens is 70 cm which is measured from the shelter's floor (Nuriyasa *et al*., 2014). Each pen shelter was completed with diet and drinking water site made of coconut shell.

Multi Nutrient Block (MNB)

Multi Nutrient Block (MNB) was made from basal molasses waste, tofu waste and pollard. Minerals sources of Ca and P were Calcium Hydro Phosphate. The MNB contains metabolize energy for 2431 kcal/kg and crude protein for 16.29 % (see Table 1).

Performance

Performance variables observed in the research were: end body weight, weight gain, diet consumption and diet conversion. End of body weight was obtained from weighed of Rabbit body weight at the end of the research.

Table 1. Ingredients Composition and MNB Content

Ingredients	Composition (%)	Nutrient Content					
		ME (Kkall/Kg)	CP (%)	CA (%)	Pav (%)	Fat (%)	CF (%)
Mollases*)	5	98	-	-	-	-	
Pollard*)	18	205,2	2,12	0,02	0,06	0,057	14,75
Tofu Waste Fermentation***)	60	1698	14,17	0,32	0,14	6	0,6
White Cement	5	0	0	0	0	0	0
Calcium Hydro Phosphate**)	6,5	0	0	1.66	1,17	0	0
NaCl	0,5	0	0	0	0	0	0
Coconut oil*)	5	430	0	0	0	0	0
Total	100	2431,2	16,29	2,0	1,37	6,057	15,35

*) Calculation base on Scott et al. (1982)
**) Calculation base on Yichang Shinta Foreign Trade Co., Ltd
***) Calculation base on Duldjaman (2005)

Carcass

Carcass data was obtained through slaughtering the Rabbits at the end of the research. They were slaughtered via cut off their jagular vein to pass out all blood in their body (Alhaidary, *et al*., 2010). Carcass percentage was calculated by divided of hot carcass weight with body weight before slaughter times 100 (Lukefahr *et al*., 1981). And to know the carcass composition, dissection among meat, bone and fat has been done.

Experimental Design and Statistical Analysis

Before the research was began, a proximate analysis has been done to all of feed ingredients needs. This field research was conducted with Randomized Block Design (RBD) and 5 replicates. Control diet was native grasses without supplemented MNB (R0), control diet supplemented MNB 15 g/head/day, 30 g/head/day and 45 g/head/day were R1, R2, R3 respectively. The MNB was made in form of block with length, wide and height of 5, 3 and 3 cm respectively. Data obtained were analyzed with Analysis of Variance. If there are significant difference ($P < 0.05$) among the treatments, analysis would be continued with Duncan Multiple Range Test (Steel and Torrie, 1980).

RESULTS AND DISCUSSIONS

Results data of the research about effects of MNB supplementation with difference doses in Rabbit diet base on native grasses to performance of local Rabbit is showed in Table 2. The Rabbits fed with diet R3 produced the highest end body live weight i.e. 1.991,8 g, while the animals fed with diet R1, R2 and R0 were 20.03, 25.59 and 36.46 % lower ($P < 0.05$), as shown in Table 2. The animals fed with diet R3 gave the highest end body live weight compare to the other treatments due to the highest diet consumption on the treatment R3 (58.73 g/day) compare to the R2 (56.21 g/day), R1 (54,58 g/day) and R0 (46.74 g/day).

Tillman *et al*. (1986) stated that higher diet consumption causes nutrients consumption also higher, it means more energy and protein could be used to grow. Nuriyasa *et al.* (2014) reported that excessive energy after the main needs of live fulfilled, the energy would be used to grow.

Table 2 showed that the highest body weight was reached by the animals fed treatment R3 i.e. 15,81 g/day, while on the animals fed treatments R2, R1 and R0 were 27.5, 40,73, and 50.53 % lower respectively (P < 0.05). Those due to diet consumption of the animals fed R3 was the highest and diet conversion was the lowest. It means that diet efficiencies used was the highest. This condition was supported by digestion coefficient data of dry matter of diet fed to the animals R3 was the highest.(75.43) than the R2 (74,54 %) and R0 (68.35 %). Tillman *et al*. (1992) reported that high crude fiber content in diet affects lower dry matter digestibility.

The Rabbits fed R0 consumed lowest diet for 45.14 g/day. The animals fed diet R1, R2 and R3 consume higher diet for 22.23, 32.03 and32.34 % (P > 0.05) than the R0 as shown in Table 2. The lowest diet consumption occurred on the animals fed diet R0 due to native grasses contains high of crude fiber, so it less palatable for the animals. From the data dry matter metabolized point of view, diet R0 was the lowest i.e. 68.35 %, while the R1, R2 and R3 were 68.52, 74.54 and75.43 % respectively.

Table 2. Performance of Local Rabbit Fed Native Grass Basal with Differ Level of MNB Suplementation

Variable	Treatment				SEM[3)]
	R0 [1)]	R1	R2	R3	
End body weight (g)	14.265,4[d]	1.482,0[c]	1.592,8[b]	1.991,8[a]	17,5
Weight Gain (gr/day)	7,82[b]	9,37[ab]	11,46[b]	15,81[a]	0,35
Diet Comsumption (g/day)	45,14[c]	55,22[b]	59,60[a]	59,74[a]	0,08
Diet Conversion	5,77[a]	5,89[a]	5,20[b]	3,77[c]	0,09
Water Consumption (ml/day)	105,22[c]	111,52[bc]	119,49[b]	133,69[a]	1,32

1) R0 : Native grasses diet without MNB sumplementation
R1 : Native grasses diet with 15 g/day MNB sumplementation
R2 : Native grasses diet with30 g/ day MNB sumplementation
R3 : Native grasses diet with 459/day MNB sumplementation
2) Value with the same superscript in the same rows means no significant difference (P>0,05) and differ superscript in the same rows means significant (p<0,05)
3) SEM : Strandard Error of The Treatment Means

The lowest diet conversion occurred on the animals fed diet R3 i.e. 3.77. But, diet conversion on the animals fed diet R2, R1 and R0 were 37.93, 56.23 and 53.05 % respectively higher (P < 0.05). Treatment R1 gave diet conversion i.e. 5.89%, while treatment R0 gave it for 2.08 % lower than treatment R1 but, statistically was no significant difference (P > 0.05) as presented in Table 2. This matter was caused by weight gain of the Rabbits fed diet R3 was the highest and quantitatively consumption of diet was not much different.

The Rabbits fed diet R3 consume highest water i.e. 133.69 ml/day but, on treatments R2, R1 and R0 were 10.62, 16.58 and 21.29 % respectively lower (P < 0.05) than treatment R3 (Table 2). The animals fed diet R3 consume highest water due to diet consumption on it was the highest. McNitt *et al.* (1996) stated that Rabbit needs water consumption to make faster it digestion process and metabolism in the animal body. Nuriyasa *et al.* (2016) said that higher growth rate of Rabbit is also needs higher water consumption particularly for Rabbit fed pellet diet because water is needed to smoother it before digest.

The Rabbit fed treatment R3 gave highest slaughter weight for 1.932 g but, the Rabbit fed treatments R1, R2 and R0 gave 220.23, 28.31 and 35.61 % respectively lower (P < 0.05) than treatment R3 (Table 3). Slaughter weight on the animals fed diet R3 was higher due to its diet consumption was the highest, so energy and protein consumption as components to form body tissue were also the highest (Table 2) and this is similar to opinion of Nuriyasa *et al.* (2016). Data in Table 2 also showed that efficiency of using diet on the animals fed diet R3 was the highest and this sesame to opinion of de Blass and Wiseman (1997).

The highest carcass weight was produced by the animals fed treatment R3 i.e. 944.8 g. Treatment diet R2, R1 and R0 gave carcass weight for 22.71, 34.50 and 38.97 % respectively lower and statistically was significant difference (P < 0.05) as shown in Table 3. Treatment diet R3 gave carcass weight higher than treatment R2, R2 and R0. The animals fed diet R3 gave the highest carcass weight compare to R2, R1 and R0. The animals fed diet R3 consume the highest energy and protein compare to other treatments. Energy and protein are the main components to form body tissues (Tillman et al., 1986). High energy and protein consumption on the animals treatment R3 caused it growth was the highest which was indicated by the highest of its end body weight. Sesame opinion were expressed by Kartadisastra (2011), McNitt *et al.* (1996), de Blass and Wiseman (1998) i.e. diet quality affects carcass weight production.

Table 3. Carcass of Local Rabbit fed Diet Native Grass Basal with Difference level of MNB Suplementation

Variable	Treatment				SEM[3)]
	R0[1)]	R1	R2	R3	
Slaughter weight (g)	1244,6[c2)]	1385[bc]	1541,2[b]	1932[a]	25,61
Carcass Weight(g)	576,6[c]	618,8[c]	730,2[b]	944,8[a]	16,30
Carcass percentage (%)	46,13[a]	44,66[a]	47,40[a]	48,88[a]	0,75
Carcass Length (cm)	31,6[b]	32,1[b]	32,4[b]	34,6[a]	0,19
Physical Composition of Carcass					
Meat of Carcass (g/100g)	59,82[a]	59,32[a]	67,74[a]	65,92[a]	0,38
Bone of Carcass (g/100g)	37,32[a]	37,68[a]	29,24[b]	31,08[b]	0,36
Fat of carcass (g/100g)	2,86[a]	3,0[a]	3,16[a]	2,98[a]	0,14

1) R0 : Native grasses diet without MNB sumplementation
R1 : Native grasses diet with 15 g/day MNB sumplementation
R2 : Native grasses diet with30 g/ day MNB sumplementation
R3 : Native grasses diet with 459/day MNB sumplementation
2) Value with the same superscript in the same rows means no significant difference (P>0,05) and differ superscript in the same rows means significant (p<0,05)

There was no significant difference (P > 0.05) to carcass percentage of Rabbit on different treatment diet (Table 3). No different of this carcass percentage due to the animals gave higher slaughter weight would also gave higher none carcass weight, so its not affects the carcass percentage production as what was said by Kartadisastra (2011) and Puger (1993).

Diet treatment R0 gave the lowest carcass length i.e. 31.6 cm. Diet treatment R1 and R2 gave 1.58 % and 2.50 % longer carcass length than R0 but, statistically was no significant difference ($P > 0.05$). Diet treatment R3 gave carcass length for 9.5% longer than the other treatments that statistically significant difference ($P < 0.05$) as shown in Table 3. This matter due to the animals fed diet R3 consumed the highest MNB, so that consumption of minerals Ca and P as the main component to form body skeleton were also gave the longest carcass.

Meat carcass weight of Rabbit offered diet R2 was above 67.74 g/100g but, others fed diet treatment R3, R0 and R1 were 2.69, 11.69 and 12.42 % respectively lower than R2 and no significant difference ($P > 0.05$) as shown in Table 3. This was caused by energy and protein consumption as the main component to compose more meat tissue on R3 than other treatments. This opinion was supported by Praga (1998) who said that protein of animal body was composed by amino acids that united with peptide to form connected polypeptide.

Bone weight of the animals fed diet R1 resulted fat weight for 37.68 g/100 g carcass, while on R0 was 0.95 % lower and statistically no significant difference ($P > 0.05$), Bone weight of the animals fed diet R3 and R2 were 17.51 %, 5 and 22.39 % respectively lower ($P < 0.05$) than R1 as shown in Table 3. This was caused by the animals fed diet treatment R0 that have no MNB supplementation as source of Ca and P minerals caused body bone formation process was not perfect as what was said by Suttle (2010).

The animals fed diet R2 gave fat weight for 3.16 g/100 g carcass but, on the R3, R1 and R0 were 5.06, 5.69 and 9.49 % respectively lower than the R2 but, statistically there was no significant difference ($P > 0.05$) as shown in Table 3. There was no differ on fat percentage produced, and this indicates that there was no differ in keeping excessive energy consumed. This opinion is similar to McNitt *et al.* (1996) who said that animal consume it to fulfill its main basic needs early then for its growth and the last excessive energy consumed would kept in the form of body fat. The lowest fat percentage quantitatively produced by the animals fed diet R0 compare to R1, R2, and R3. This condition connects to energy total consumed by the animals. Heresign *et al*. (1977) and Tillman et al. (1986) said that animal consume energy is to fulfill its energy needs and its surplus would be kept in the form of fat. The more energy consume, the more it could be kept in the form of fat.

CONCLUSION

Base on the research results mentioned above, it can be concluded that performance and carcass of local male Rabbit fed basal diet of native grasses and supplemented with 45 g/head/day of the MNB were higher than other treatments.

ACKNOWLEDGMENT

In this occasion, The authors wishes to thank to Indonesia government through LPPM, Udayana University. who gave financial support to this work. we would like to thank to the Rector of Udayana University, the Director of Program *Pascasarjana* Udayana University, the head of Program Study of Animal Science Program *Pascasarjana* and the Dean of

Faculty of Animal Science Udayana University for their administration and education facilities services to the researcher during his study.

REFERENCES

i. Alhaidary, A., H.E. Mohamed and A.C. Beynen. 2010. Impact of Dietary Fat Type and Amount on Growth Performance and Serum Cholesterol in Rabbits. American J. of Animal and Veterinary Sciences 5(1): 60-64.

ii. De Blass, C and J. Wiseman. 1998. The Nutrition of the Rabbit. CABI Publishinr. University of Nottingham. Nottingham. P.39-55.

iii. Haresign, W., H. Swan, D. Lewis. 1977. Nutrition and the Climatic Environment. Faculty of Agricultural Sciences, University of Nottingham, London.

iv. Kartadisatra, H.R. 2011. Kelinci Unggul. Penerbit Kanisius, Jakarta.

v. Lukefahr, S.D., W.D. Hohenboken, P.R. Cheeke, N.M. Patton and W.H. Kennick. 1981. Carcass and Meat Characteristics of Plemish Giant and New Zealand White Purebreed and Terminal – Crossbred Rabbits. J. Of Appl, Res. 4(3): 66-72.

vi. Mc.Nitt, J.I., N.M. Nephi, S.D. Lukefahr and P.R. Cheeke. 1996. Rabbit Production. Interstate Publishers, Inc.p. 78-109.

vii. Nuriyasa, M. 2012. "Respon Biologi Serta Pendugaan Kebutuhan Energi dan Protein Ternak Kelinci Kondisi Lingkungan berbeda Di Daerah Dataran Rendah Tropis"(disertasi). Program Pasca Sarjana. Universitas Udayana. Denpasar.

viii. Nuriyasa, I.M., I.M Mastika, I. G Mahardika, I.W Kasa and IG.Ag.I Aryani. 2014. Energy and protein retantion of local rabbit houshed in different cages. J.Biol.Chem. Research. Vol. 31 No 2: 800 – 807 (2014).

ix. Nuriyasa, I. M., I.M. Mastika and G. Ayu Mayani Kristina dewi. 2015. Performance of local rabbit (Lepus nigricollis) fed diets containing different level of fermented coffee pulp. African Journal of Agricultural Research Vol. 10 (52): 4820 – 4824.

x. Nuriyasa, I. M. 2016. Beternak Kelinci Lokal di Dataran Rendah Tropis. Majalah Nandaka. Peluang Bisnis dan Ternak Upakara. Fakultas Peternakan. Universitas Udayana: Denpasar. Hal. 35-37.

xi. Nuriyasa, I.M., W.S Yupardhi, E. Puspani. 2016. Study on Growth rate of local male rabbits (Lepus nigricollis) fed different energy levels diet and sheltered in different density. J.Biol. Chem. Research, Vol. 33(1) 2016:

xii. Praga, M.J. 1998. Protein Requirment. In. The Nutrition of the Rabbit. Ed. C. de Blas and J.Wiseman. CABI Publishing, New York. p.133-143.

xiii. Puger, A.W. 1993. Evaluasi Hijauan Provenance Gamal (Gliricidia sepium) terhadap Pertumbuhan dan Komposisi Karkas Kelinci (tesis). Program Pascasarjana, Institut Pertanian Bogor.

xiv. Salma, U., A.G. Miah, Y. Akter, Z.H. Khandaker and A.Reza. 2004. Effect of Different of Protein Suplementation on Reproductive Performance of Rabbit Does Under Tropical Condition. International Journal of Agriculture &Biology.

http://www.fspublishers.org/ijab/past-issues/IJAB vol.6 No.5/12. Disitir Tanggal 20 Nopember 2010.

xv. Schiere, J.B. 1999. Backyard Farming in the Tropics. CTA Pubblished, New York.

xvi. Steel, R.G.D. and J.H. Torrie. 1980. Prinsip dan Prosedur Statistika. Suatu Pendekatan Biometrik, Edisi kedua. Diterjemahkan Oleh Sumantri. Gramedia. Jakarta.

xvii. Suttle, N.F. 2010. Mineral nutrition of livestock 4^{th} Edition. www.cabi.org.

xviii. Tillman, A.D., H. Hartadi, S . Reksohardiprodja.,P.Soeharto dan L. Soekamto. 1986. Ilmu Makanan Ternak Dasar. Gadjah Mada, University Press, Yogyakarta

xix. Xiccato, G. M.Bernardini, C.Castellini, A. Dalle Zotte, P.I. Queaque and A.Trocino.1999. Effect of Postweaning Feeding on the Performance and Energy Balance of Famale Rabbits at Different Physiological. States. Journal of Animal Science, Vol. 77 (2) : 416-426. http://jas.fas org/cgi/content/abstract/77/2/416. Disitir Tanggal 20 Nopember 201.