



Performance and Carcass of Local Rabbit (*Lepus nigricollis*) Fed Concentrate on Different Levels Based on Carrot Leaf Waste (*Daucus carota L.*)



I.M. Nuriyasa ^a, E. Puspani ^b, W. Sayang Yupardhi ^c

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Correspondence Author ^a



Abstract

Research about the performance of local rabbit fed different level of concentrate based on *Daucus carota L.* was conducted for 12 weeks at Dajan Peken Village, Tabanan District, Tabanan Regency. The research design used was Randomized Block Design with 5 replicates. The animals were allocated randomly into 4 treatments i.e. control ration carrot leaf (*Daucus carota L.*) (R0), control ration with 10 g concentrate/head/day (R1), control ration with 20 g concentrate/head/day (R2) and control ration with 30 g concentrate/head/day (R3). *Daucus carota L.* and drinking water offered *ad libitum*. Results of the research showed that performance of the animals fed control ration with 30 g concentrate/head/day (R3) was higher ($P < 0.05$) than that R0 (control) and other treatments. Carcass weight, meat, and fat of the animals fed ration R0 was lower ($P < 0.05$) compare to treatment R1, R2, and R3. There was no significant difference ($P > 0.05$) to variables of carcass weight, bone weight, and meat bone ratio among R0, R1, R2, and R3 percentages. It could be concluded that the animals fed *Daucus carota L.* as basic ration that was supplemented with concentrate 30 g/head/day produced higher performance and carcass compare to the animals supplemented 20 g/head/day and 10 g/head/day.

Keywords

Concentrate;
Daucus carota L.;
Lepus nigricollis;
Local rabbit;
Productivity;

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Contents

Abstract.....	13
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^a Faculty of Animal Science, Udayana University, Denpasar, Bali, Indonesia

^b Faculty of Animal Science, Udayana University, Denpasar, Bali, Indonesia

^c Faculty of Animal Science, Udayana University, Denpasar, Bali, Indonesia

1. Introduction	14
2. Materials and Methods.....	14
3. Results and Discussions.....	15
3.1 Ration consumption.....	16
3.2 Body weight gain and end body weight	16
3.3 Carcass	17
4. Conclusion.....	17
Acknowledgements.....	17
References.....	18
Biography of Authors.....	19

1. Introduction

Diversification of farmer business is not on a big animal only, but the small local animal i.e. rabbit is also potential to develop. Rabbit farming in Indonesia is still facing some obstacles such as low of farmers knowledge in case of the animal ration particularly energy and protein content in it.

Up to now, the farmers at high land altitude are much fed the animal with carrot leaf as basic ration. Farmers fed concentrate supplement, *i.e.* the rest of rice mixed with rice bran, tofu waste mixed with rice bran without any format on its quantity and quality. This ration formula fed to the animals may not enough to fulfill nutrient needs of the animals as was recommended by [Nuriyasa *et al.* \(2014\)](#) that local rabbit at tropical countries needs protein 16% and metabolizable energy 2600 kcal/kg.

According to [Esminger \(1991\)](#), rabbit feed could be green forages, but it enough to maintain, so its production would not be maximum. Therefore, it needs a feed supplement. There are many farmers no think yet about carrot leaf waste to make it for rabbit feed. Besides the leaf is easy to find out and cheap price, its also source of carbohydrate and minerals Ca, P, Fe and Mg ([Nuriyasa, 2017](#)). The leaf could become selected feed because it is one of agriculture waste product that can be made for a basic ration that offers together with ration.

[Xiangmei \(2008\)](#) stated that a rabbit fed ration with the energy-protein ratio which was no match with it needs optimally would decrease its productivity. Results study of [Puger and Nuriyasa \(2017\)](#) found that supplemented Multi Nutrient Block (MNB) 45 g/day on base native grass produced higher performance than that 30 g/day, 15 g/day and without supplementation of the NMB.

2. Materials and Methods

The Animal

The research used 40 male local rabbits (*Lepus nigricollis*) on the age of 7 weeks.

Pen and Equipment

The research used a battery system pen which was made of iron with the size of 70, 50 and 50 cm long, wide and high respectively. The pens were completed with water and feed places which made of coconut shells.

Concentrate

Table 1
Composition of concentrate nutrition content

No	Ingredient	Composition (%)	Energy (kcal)	Crude Protein (%)	Crude Fiber (%)	Calcium (%)	Phosfor (%)
1	Fish mill	2	59,4	0,8	2,1	0,028	0,028
2	Pollard	35,1	456,3	6,26	2,25	0,03	0,074

3	Yellow corn	49	1651,3	7,35	0	0,09	0,0019
4	Coconut mill	7	10,8	1,47	0,027	0,005	0,0018
5	Molasses	6,4	125,44	0,192	0	0,09	0,078
6	Pignox	0,3				0,08	0,04
7	NaCl	0,2				0,0074	0,04
Total		100	2405,5	15,07	4,38	0,30	0,26
MCNitt Recommended (1996)			2400	15	14	0.50	0.30

Ration fed to the animal in the research consisted of 4 rations (R) i.e. control treatment R0 was carrot leaf waste only, R1 was carrot leaf as basic ration supplemented with concentrate 10 g/head/day, R2 was concentrate supplemented 20 g/head/day, R3 was concentrate supplemented 20 g/head/day.

Place and Length of Research

The research was conducted for 12 weeks at Dajan Peken Village, 156 m above sea level, Tabanan District, Tabanan Regency, Bali Province.

Research Design

The research design used was Randomized Block Design (RBD) with 4 treatments and 10 blocks (replicates), so there were 20 experiments.

Variable Observed

- Ration Consumption. Ration consumption was calculated every day where the sum of ration offered minus the rest of it (g/head/day).
- Body Weight Gain. Daily body weight gain was the result of the end of body weight minus initial body weight and divided with the sum of day.
- End of Body Weight. The end of body weight was obtained at the end of the research.
- Ration Conversion. Ration conversion was amount ration consumed divided with body weight gain at the same time.
- Carcass

The animals were slaughtered on the age of 84 days according to [Owen and Owen Standard \(1981\)](#) and procedure of [Alhaidary et al. \(2010\)](#) by cut off jugular vein at neck to bring outside its blood. Then the animal's body was hung trough one of their hind shins. The hide was removed and then the head at the *atlanto-occipital* joint, the lower leg at the *tarso metatarsal* and *carpo-metatarsal* joints and the tail at the junction between the *sacral* and the *coccygeal vertebrae*. After evisceration, the visceral organs except lungs was brought outside from the body cavity. Empty body weight was obtained by brought outside of the visceral organ. Carcass percentage was calculated as total weight of hot carcass included body capacity fat and lungs divided by body weight before slaughtered times 100 ([Puger and Nuriyasa, 2017](#)). Carcass physical composition was obtained through separated components of bone, meat and carcass fat. Meat and bone ratio was obtained by divided meat weight with bone weight.

Data Analysis

The research results data were analyzed with multiple range test, if there was a significant difference among the treatments ($P < 0.05$). It would be continued to Duncan's test ([Steel and Torrie, 1980](#)).

3. Results and Discussions

The research results showed that the local rabbit (*Lepus nigricollis*) performance fed concentrate on different levels with a basic ration of carrot leaf waste (*daucus carota l.*) could be seen in Table 2.

Table 2
Performance and carcass of the rabbit fed basic ration of carrot leaf which was supplemented with concentrate in different levels

Variable	Treatment				SEM ²⁾
	R0 ¹⁾	R1	R2	R3	
Consumption of carrot leaf (g/h)	33,46 ^d	31,87 ^c	25,58 ^b	24,53 ^a	1,38
Consumption of concentrate (g/h)	0 ^d	14,17 ^c	25,62 ^b	38,12 ^a	1,31
Total consumption (g)	33,46 ^d	46,04 ^c	51,20 ^b	62,65 ^a	1,74
End of body weight (g)	1272,40 ^c	1437,80 ^b	1592,4 ^a	1712,8 ^a	46,44
Body weight gain (g/day)	9,33 ^d	11,20 ^c	13,19 ^b	14,28 ^a	0,71
Ration conversion	3,57 ^c	4,27 ^a	3,88 ^b	4,41 ^a	0,30
Carcass weight (g/head)	588,31 ^b	700,23 ^a	780,02 ^a	857,52 ^a	35,73
Carcass percentage (%/head)	46,23 ^a	48,70 ^a	48,98 ^a	50,07 ^a	3,01
Bone weight (g/head)	190,91 ^a	196,43 ^a	200,68 ^a	212,20 ^a	5,99
Fat weight (g/head)	12,48 ^d	16,56 ^c	20,52 ^b	28,88 ^a	0,61
Meat weight (g/head)	384,92 ^b	487,24 ^a	558,82 ^a	616,44 ^a	5,67
Meat Bone Ratio	2,02 ^a	2,48 ^a	2,78 ^a	2,90 ^a	0,12

Note:

- 1) R0: Carrot leaf basic ration fed without concentrate
R1: Carrot leaf basic ration fed with concentrate 10 g/head/day
R2: Carrot leaf basic ration fed with concentrate 20 g/head/day
R3: Carrot leaf basic ration fed with concentrate 30 g/head/day
- 2) Same superscript in the same rows showed no significant difference ($P > 0.05$) and different superscript in the same rows showed a significant difference ($P < 0.05$)
- 3) SEM: *Standard Error of the treatment means*

3.1 Ration Consumption

The research results showed that the average ration consumption of the animal fed basic ration carrot leaf with concentrate 30 g/head/day (R3) was 62.653 g/day (Table 2), but consumption of the animal fed basic ration carrot leaf with concentrate 20 g/head/day (R2), 10 g/head/day (R1) and without concentrate (R0) was 18.277%, 26.520% and 46.588% lower respectively ($P < 0.05$) compare to R3 (Table 2). The animals fed ration R0 was consumed higher carrot leaf ($P < 0.05$) than the R1 R2 and R3. Concentrate consumption of the animal fed ration R3 was higher ($P < 0.05$) than other treatments. The animals are not ruminant herbivorous preferred sweet taste of carrot leaf (Nuriyasa, 2017). This caused the animal could fulfill its nutrient maintenance needs and could grow event fed with carrot leaf forage only without concentrate supplementation. Ensminger *et al.* (1990) said that rabbit feed could forages, but its productivity is not maximum. de Blass and Wiseman (1997) stated that the animal could grow and develop by using various kinds of forages efficiently as the main feed. But, the forages feed is enough to fulfill maintenance of life only, so its productivity is not maximum. Therefore, it needs concentrate to fulfill its nutrient needs. The animal needs concentrate as a source of energy to develop bacteria in cecum and colon quickly for fermenting crude fiber (McNitt *et al.*, 1996). There was no significant difference ($P > 0.05$) on variables of carcass percentage and meat bone ratio among treatments. This was due to higher carcass weight on the animals that have higher growth rate and end weight.

3.2 Body Weight Gain and End Body Weight

The animals fed ration R3 produced body weight gain 14.281 g/day (Table 2). Others fed ration R2, R3 and R0 produced body weight gain 21.547%, 7.604% and 34.661% lower respectively ($P < 0.05$) than R3. The

highest end body weight was reached by the animal fed basic ration carrot leaf with concentrate 30g/head/day (R3) i.e. 1712.8 g (Table 2). The animal fed ration R2, R1 and R0 was 7.029%, 16.055% and 25.712% lower respectively ($P < 0.05$) compare R3. Higher ration consumed because energy and protein consumed were also higher. Nuriyasa *et al.* (2018) stated that the higher energy and protein consumed, the higher metabolism and growth of the animal.

3.3 Carcass

Carcass and meat weight of the animals fed ration R0 were lower ($P < 0.05$) compare to R1, R2, and R3. The animals fed forage only without concentrate supplementation (R0) is not capable to grow optimally (Ensminger *et al.* 1990). The animal fed treatment R0 caused total ration consumption lower than R1, R2, and R3. Nuriyasa *et al.* (2015) said that the higher energy and protein consumption, the higher the animal growth. Higher meat carcass production was produced by the higher growth rate of the animals, so formed of body skeleton also became high, so that meat bone ratio produced no significant difference.

4. Conclusion

Base on the research results, it could be concluded that local rabbit fed ration based on carrot leaf, supplemented concentrate 30g/head/day (R3) produced higher performance and carcass than supplemented concentrate 20g/head/day (R2), concentrate 10g/head/day (R1) and without concentrate supplementation (R0).

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Biography of Authors

	<p>Dr. Ir. I Made Nuriyasa, MS. Was born in Tabanan, Bali, Indonesia, February 20, 1962. His academic position is Associate Professor, in the Faculty of Animal Science, Udayana University (UNUD). The university is located at Jimbaran District, Badung Regency, Indonesia, (+62361701772); P.B Sudirman Street, Bali, Indonesia (+62361222096), Fax. +62361222096. He lives at Jalan Sriwijaya, No. 25 Tabanan Regency, Bali, Indonesia, and Ph. 6282237230123. He graduated his bachelor degree in the Faculty of Animal Science, Department of Animal Nutrition in 1986. He finished his master degree in the Institute of Agriculture (IPB) Bogor, Indonesia; Department of Animal Nutrition in 1991. He completed his doctoral degree in Udayana University; Department of Animal Science in 2012. <i>Email: madenuriyasa@unud.ac.id</i></p>
	<p>Eny Puspani, S.Pt, MP. Was born in Denpasar, Bali, Indonesia, Mei 4, 1979. Her academic position is Associate Professor, in the Faculty of Animal Science, Udayana University (UNUD). The university is located at Jimbaran District, Badung Regency, Indonesia, (+62361701772); P.B Sudirman Street, Bali, Indonesia (+62361222096), Fax. +62361222096, and Ph. +62818555700. She lives at Tegal Wangi, Denpasar Regency, Bali, Indonesia. <i>Email: eny_fapet@unud.co.id</i></p>
	<p>Prof. Dr. Ir. I Wayan Sayang Yupadhi, M.Agr, Sc. Was born in Gianyar, Bali, Indonesia, February 18, 1949. He is a Professor in the Faculty of Animal Science, Udayana University (UNUD). The university is located at Jimbaran District, Badung Regency, Indonesia, (+62361701772); P.B Sudirman Street, Bali, Indonesia (+62361222096), Fax. +62361222096. He lives at Kembang Matahari No. 8, Denpasar, Indonesia and Ph.+628179774658 <i>Email: sayang@unud.ac.id</i></p>