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SUBSTITUTION OF COMMERCIAL FEED WITH MORINGA LEAF MEAL TO IMPROVE THE PERFORMANCE OF MALE RABBIT

N.M.R. Suarni[1*], N.G.A.M[1]. Ermayanti, N.N. Wirasiti[1]

[1]Study Program of Biology, Faculty of Mathematic and Natural Sciences Udayana University Indonesia

[*]Email : rai_suarni@unud.ac.id

ABSTRACT.

The aims of this study were to find out the effects of moringa leaf meal substitution in commercial feed on the performance of male rabbits (bucks). Twenty four four months old male rabbits with an average live weight of 1200g were used in this study. There were four treatments in this study including 0% (K0) as control and 15% (K1), 30% (K2), 45% (K3) substitution of moringa leaf meal in commercial feed and each treatment consisted of six replicates. The treatments were carried out for two months. The variables measured were including body weight, feed consumption, feed conversion. The results showed that there were significant differences (P <0.05) performance between all treatments (K1, K2, K3) and the control (K0). Substitution of moringa leaf meal up to 45% in commercial feed increase performance of male rabbit. It was concluded that the moringa leaf meal might be substituted in commercial feed up to 45 % to improve the performance of male rabbits (bucks). To get maximum performance of male rabbit rabbits it should be better substituted the commercial feed with moringa leaf meal is 35%.

Keywords: *moringa leaf meal, commercial feed, male rabbits, sperm quality*.

ABSTRAK.

Tujuan penelitian ini adalah untuk mengetahui pengaruh substitusi tepung daun kelor pada pakan komersial terhadap performa kelinci jantan. Kelinci jantan berumur 24 bulan dengan berat badan rata-rata 1200g digunakan dalam penelitian ini. Ada empat perlakuan dalam penelitian ini yaitu 0% (K0) sebagai kontrol dan 15% (K1), 30% (K2), 45% (K3) substitusi tepung daun kelor dalam pakan komersial dan masing-masing perlakuan terdiri dari enam ulangan. Perlakuan dilakukan selama dua bulan. Variabel yang diukur meliputi berat badan, konsumsi pakan, konversi pakan. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan (P <0,05) performa antara semua perlakuan (K1, K2, K3) dan kontrol (K0). Substitusi tepung daun kelor hingga 45% dalam pakan komersial meningkatkan performa kelinci jantan. Disimpulkan bahwa tepung daun kelor dapat disubstitusi dalam pakan komersial hingga 45% untuk meningkatkan performa kelinci jantan. Untuk mendapatkan performa yang maksimal kelinci jantan sebaiknya subsidi pakan komersial dengan tepung daun kelor adalah 35%.

Kata kunci*: tepung daun kelor, pakan komersial, kelinci jantan, performa.*

INTRODUCTION

Rabbit breeders especially in Bali, generally only use grass as rabbit feed. Rabbits that are only given grass feed will cause lower body weight and slower growth compared to rabbits fed the commercial feed. Commercial feed for rabbits is widely available on the market but at prices not affordable to rabbit farmers. Need to look for alternative feed for rabbits that are cheap, sustainable, easily available and of high quality. Moringa is a legume plant whose production is continuous and has more value in the content of protein, minerals and vitamins so that it can overcome the constraints of food availability throughout the year. The use of moringa leaf meal as a source of protein in reinforcing feed has been widely applied. Moringa leaf meal can replace kapok seed meal as a feed supplement of 20% of growing sheep feed (Murro et al. 2003).Based on this, the research concerning substitution of commercial feed with moringa leaf meal to improve the perfomance of male rabbit.

METHOD

Treatmens

The design used in this study is completely randomized design (CRD). There were four treatments in this study, control (K0) by 100% commercial feed, K1 by 15% meal of moringa leaves as a substitute for commercial feed, K2 by 30% meal of moringa leaves as a substitute for commercial feed and K3 by 45% meal of moringa leaves as a substitute commercial feed. Each treatment consisted of six replicates, so that the population used in this study were 24 male rabbits. The treatments were conducted for two months.

Sampling collection and analysis

Body Weight of Rabbit

Before and after giving treatment, body weight of male rabbits weighed as initial body weight data and final weight data. The difference between the final weight and the initial weight is weight gain during treatments of rabbit. Rabbit Body weight measured in grams (g).

Feed Consumption

Feed consumption was calculated every week by subtracting the amount of feed given by the feed remains on that day.

Total feed consumption obtained by adding the feed intake of each week during the study. Feed consumption is stated in g / day.

Feed Conversion

Feed conversion or Feed Conversion Ratio (FCR) is the ratio between the amount of feed consumed with the weight gain.

Data Analysis

Data were analyzed by analysis of variance (ANOVA) using costat program. To determine the differences between treatments including the control group, it was conducted using Duncan's Multiple Range test with a confidence level of 5% ($P < 0.05$).

RESULT

Body Weight

Substitution of commercial feed with moringa leaf meal increased significantly ($P < 0.05$) the final body weight of male rabbit as presented in (Table 1). The weight gain of rabbits fed with commercial feed substitution treatment with Moringa leaf meal also increased significantly ($P < 0.05$). Further test results show there was a difference between control and K1, K2 and K3, but between K1, K2 and K3 were not significantly different (Table 1). Weight gain is influenced by protein and calories consumed (Sukardi *et al*., 2005). In this study, the highest protein and calory contents were in K3 treatment, but the highest consumption occurred in treatment K2 of 95,56g / day caused the highest weight increase in the treatment of K2. The weight of the control group was the lowest compared to other treatments. This was because the control group had the lowest feed consumption, it also due to the lowest protein and energy contents as major component in the control of body tissue constituent. This is supported by the opinion of Nuriyasa (2012) who suggested that the highest feed intake resulted in the highest body weight.

Feed consumption

Substitution of commercial feed with moringa leaf meal increased significantly ($P < 0.05$). The amount of the average consumption per day of male rabbits, information is presented in. (Table 1).

An increasing feed intake from the control up to the K2 treatment because crude fiber content from the control until the K2 decreased. Lower crude fiber

content in the feed led to feed more rapidly absorbed, so it will be faster gastric emptying. Lower crude fiber content resulted in increased dry matter intake. The length of time of the feed stream in the digestive tract also affects the feed intake. Tilman *et al*. (1986) argued that feed flow rate is influenced by the crude fiber content in feed.

The higher the crude fiber content in the feed the longer the flow of feed in the digestive tract. The longer the flow of feed in the digestive tract then the less consumption of feed and vice versa the faster the flow of feed in the digestive tract the more the feed consumption. Kasa et al. (1989) also states that the slow feed flow causes decreased feed consumption due to gastric emptying becomes longer.

Table 1.
The average performance of rabbits given commercial feed substituted with the moringa leaf meal

Parameter	Treatment			
	K0	K1	K2	K3
Initial body weight (g)	1229,67a	1229,50a	1229,67a	1229,83a
Final body weight (g)	2058,33c	2066,16b	2071,33a	2067,33ab
Total weight gain (g)	828,67b	836,67a	841,67a	837,50a
Weight gain/day (g)	13,81b	13,94a	14,03a	13,96a
Feed Consumption (g/hr)	90,88d	92,18c	95,56a	92,60b
Feed Conversion	6,59b	6,61b	6,81a	6,63b

Different letter at the same row indicates significantly different results ($p>0.05$). K0 = commercial feed of 100%, K1 = commercial feed substituted with 15% of moringa leaf meal, .K2 = commercial feed substituted 30% moringa leaf meal, .K3 = commercial feed substituted 45% moringa leaf meal.

Total consumption of K3 is lower than K2, although crude fibers contained in K3 was lower than K2. This is presumably because the meal content of moringa leaves was the most at K3, which led to decreased palatability. Astuti *et al*. (2005) suggested that moringa leaves contain several anti-nutritional substances include: 0.3% of tannins, 6.4% of saponin, 2.3% of phytat acid and 2.7% of total phenol. Tannins and saponins cause a bitter taste in moringa leaves so that more content of moringa leaves in the feed will cause a bitter taste in the feed and be less favored by rabbits. McNitt *et al.* (1996) suggested that the consumption of livestock feed on rabbits is influenced by environmental factors, energy content, texture, odor and palatability of feed.

Feed conversion

Substitution of commercial feed with moringa leaf meal significantly affect the value of a male rabbit feed conversion. The advanced test results by Duncan's Multiple Range Test have found that only the treatment of K2, i.e. 30% substitution of commercial feed with Moringa leaf meal was significantly different from the control ($P < 0.05$). The highest feed conversion value in this study occurred at the K2 treatment of 6.81. This was due to the highest consumption applied in the treatment of K2 which was 4.25% higher than the control that significantly different even with all the treatment, while the weight gain in treatment of K2 was significantly different only from the controls i.e. merely 1.57% higher than the control.

Feed conversion is the ratio between the amount of feed consumed with body weight gain within a specified period (North, 1984). Feed conversion can be used as a measure to assess the efficiency of the use of feed and feed quality. The lower the feed conversion rate means the better quality of the feed. McNitt *et al*. (1996) stated that the conversion of animal feed rabbits is 3.0 to 4.0.

The average feed conversion values in this study were 6.59 (K0), 6.61 (K1), 6.81 (K2) and 6.63 (K3) which means above the range of rabbit feed conversion value reported by McNitt *et al.* (1996). High feed conversion value in this study cannot be said that the quality of feed used was low as can be seen from the results obtained in this study that feed did not adversely affect the performance of male rabbits. Rasyaf (1992) states that one

measure of efficiency is to compare the amount of feed given (input) with the results obtained (output). The results obtained (output) in this study showed the increase of male rabbit weight, so that the consumption of rabbits used for growth activities. Another factor proving that feed used was not low in term of quality is because the rabbits used for research already four months old, at the age where they were approaching sexual maturity. Rabbit consumption at that age was the same as adult rabbits, but the gain weight to reach adult rabbits were not so high that the results of feed conversion value became high as well. This is supported by the results of research of Salisu and Iyeghe-Erakpotobor (2014) suggested that there is no difference in feed intake in rabbit aged 15 weeks with that of 19 weeks of age.

CONCLUSION

It was concluded that the moringa leaf meal might be substituted in commercial feed up to 45 % to improve the performance (body weight, feed consumtion, feed conversion).. To get maximum performance of male rabbit rabbits it should be better substituted the commercial feed with moringa leaf meal is 35%.

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