

EFFECT OF FEEDING MARKET VEGETABLE WASTE ON WEIGHT GAIN OF RABBITS (*Oryctolagus cuniculus* L.)

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Abstract

Rabbits are livestock that has the potential to provide meat in a relatively short time, so people's consumption of animal protein is expected to be fulfilled. Market vegetable waste can also be used as feed, especially for rabbits. When processed into rabbit feed, waste is not only a product, but from the feed consumed by rabbits, it can produce meat of good quality. This study aimed to determine whether feeding vegetable waste can increase rabbit body weight and whether combining pellets and vegetable waste can increase rabbit body weight. This study used a quantitative experimental method using an experimental design that was Completely Randomized Design (CRD) with six treatments and four replications. The survey results showed that feeding vegetable waste was effective as feed for rabbits because it could increase the body weight of rabbits (*Oryctolagus Cuniculus* L.). The more balanced the market vegetable waste feed in the form of cabbage, carrots, pattern (young corn shoots) and pellets were given, the higher the weight gain of rabbits (*Oryctolagus Cuniculus* L.). Market vegetable waste is not recommended as a good feed. Still, it can be used as a supplement only because research results show that market vegetable waste does not have a significant effect.

Keywords: Rabbit (*Oryctolagus cuniculus* L.), Vegetable Waste, Pellets, Protein

INTRODUCTION

Many factors that lead to a balanced diet influence people's consumption habits. These factors are population growth, income growth, and public knowledge about the importance of nutrition for the body. This increases the demand for quality food. Meat is a nutrient-rich food; meat is also a good source of animal protein. Meet the need for meat as a source of animal protein, raising rabbits is an alternative that can be used to meet the ever-increasing demand for animal protein. The main thing pets need to live is food; by consuming quality food, animals can make the products humans need. Some of the obstacles for rabbit breeders are the need for more knowledge about the characteristics of rabbits related to feeding management, maintenance and health (Wiguna et al., 2017). Feed prices are an obstacle to business development in the livestock sector. Using market waste as an alternative feed

for animals is an innovation to overcome the commercial barriers of the livestock industry, such as high prices for animal feed.

Some of the obstacles for rabbit breeders are the need for more knowledge about the characteristics of rabbits related to feeding management, maintenance and health (Wiguna et al., 2017). Feed prices are an obstacle to business development in the livestock sector. Using market waste as an alternative feed for animals is an innovation to overcome the commercial barriers of the livestock industry, such as high prices for animal feed. Using market waste in a feed that is suitable for consumption by rabbits can be beneficial for rabbits who consume it and can save farmers the cost of morning feed (Nur Syuhada, 2020).

Utilization of vegetable waste from the market is often used as fertilizer. Besides being used as fertilizer, market vegetable waste can also be used as animal feed, especially for rabbits. When processed into rabbit feed, waste is not only a product; the feed consumed by rabbits can produce good-quality meat (Sutrisno et al., 2019).

Rabbits are animals prone to diarrhoea, so vegetable waste must be sorted first to become rabbit food so that it is not easily contaminated. Vegetable waste which is used as raw material for animal feed, has many advantages, meaning it has economic value because it can produce food that is useful, inexpensive, easy to obtain and not competitive with human needs. In addition, using vegetable waste can minimize the problem of environmental pollution by waste (Bahar et al., 2016).

This study examines the utilization of market vegetable waste as an alternative to commercial pellet feed for rabbits. At the same time, the expected results are obtained by obtaining the composition of market vegetable waste and commercial pellets as rabbit feed. Based on the explanation above, the researcher is interested in researching "The Effect of Feeding Market Vegetable Waste on Body Weight Gain (PBB) of Rabbits (*Oryctolagus cuniculus* L.).

MATERIALS AND METHODS

This research was conducted in Pinaesaan Village, Kec. New Tomapso, Kab. South Minahasa, starting on 29 November 2021 to 09 January 2022. The tools used in this study are saws, machetes, nails, hammers, bamboo, thin boards and wire to make rabbit cages. And also sacks, markers, knives, scales, pellet feed containers and 24 vegetable waste and 24 rabbit drinking containers. The materials used in this study were market vegetable waste in the form of cabbage, carrots, pattern (young corn shoots) and also 24 rabbits.

Cage Preparation

The shape of the rabbit cages used in this study is the postal cage, made of wood, in a rectangular shape with a size of 60cm x 40cm x 50cm (length x width x height) for each rabbit. This is done to avoid competition between rabbits for food. In each cage, there is a place to drink and a place to feed the rabbits at the bottom. The cage will be given a sack to make it easier to clean the rabbit cage.

Rabbit Preparation

The test animal used in this study was a male rabbit (*Oryctolagus cuniculus* L.). Who is two months old with a body weight of 350-400 grams. The rabbits used in the study are in healthy condition and have relatively stable body weights. These rabbits will be obtained from rabbit breeders in North Sulawesi.

Research Parameters

The parameter in this research is the rabbit's weight gain. To record the rabbit's weight using a scale, put the rabbit on the scale by taking the rabbit from the cage and holding the rabbit by the stomach so that the rabbit feels comfortable. Then record the rabbit's weight. The results of rabbit body weight can be known after being treated for one month and two weeks.

RESULTS AND DISCUSSION

Results

The results of observing the rabbit's weight before receiving the treatment and the weight after receiving the feed treatment for 42 days or equal to 6 weeks, obtained from 6 treatments and four replications, can be seen in Figure 1.

Based on Figure 1, it is known that the initial body weight of the rabbit before the feed treatment, namely the highest weight in P1 with an average number of 382.5 grams and the lowest body weight in the P4 treatment with an average weight of 355 grams. While the total weight after being given feed treatment, the highest weight was in treatment P1 with an average weight of 1910 grams and the lowest body weight in the P6 treatment with an average weight of 917.5 grams.

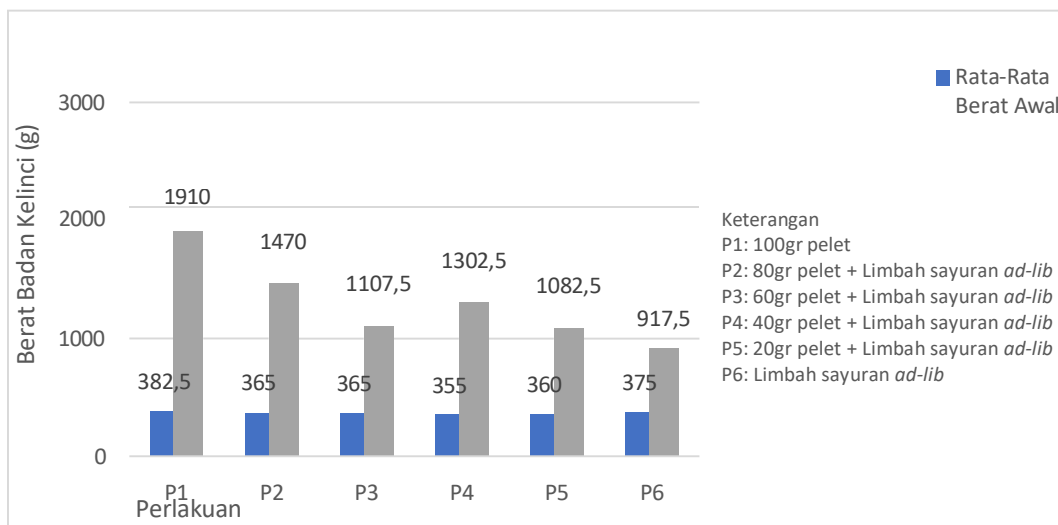


Figure 1. Average Initial and Final Body Weight of Rabbits

Based on the results of the research conducted, data obtained from the results of the feeding treatment between pellets and market vegetable waste on the body weight gain of the rabbit (*Oryctolagus Cuniculus* L.) obtained from the weight of rabbit after receiving the feed treatment minus the weight of the rabbit before receiving the feed treatment. Then calculated and compiled according to each treatment and replication, which can be seen in the table below:

Table 1. Research Data on the Average Difference in Rabbit Body Weight (grams)

Average	Ulangan				Jumlah	Rata-Rata
	1	2	3	4		
P1= P 100g	1.280	1.820	1.240	1.770	6.110	1.527,5
P2= P 80g + LSP <i>ad-lib</i>	1.140	710	1.250	1.320	4.420	1.105
P3= P 60g + LSP <i>ad-lib</i>	960	600	360	1.050	2.970	742,5
P4= P 40g + LSP <i>ad-lib</i>	730	940	800	1.320	3.790	947,5
P5= P 20g + LSP <i>ad-lib</i>	690	820	490	890	2.890	722,5
P6= LSP <i>ad-lib</i>	430	540	550	650	2.170	542,5
Total					22.350	5.587,5

Ket: P= Pelet, LSP = Limbah Sayuran Pasar, *ad-lib*= *ad libitum*

From table 1, the results of research that has been conducted on the Effect of Feeding Market Vegetable Waste on PBB (Body Weight Gain) Rabbits (*Oryctolagus Cuniculus* L.) obtained the average body weight of rabbits (*Oryctolagus Cuniculus* L.) which can be seen in Figure 2 below :

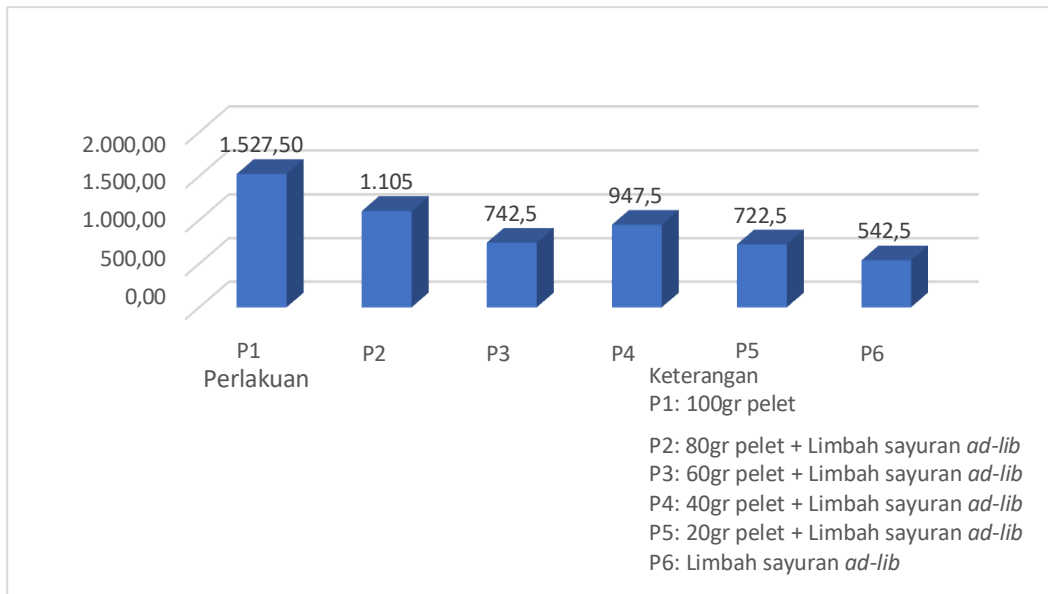


Figure 2. Average difference in body weight of rabbits

The figure above shows that the P1 treatment with 100 grams of pelleted feed showed that pelleted feed greatly affected the rabbit's body weight gain. This can be seen in the image above.

Data analysis

Table 2. Data on Anava results on the average difference between the initial and final body weight of rabbits

Source of Diversity	Degrees of Free (DB)	Total Square (JK)	Middle Square (KT)	F Hitung	F Tabel
Treatment	5	2465187,500	493037,500	7,744**	2,77
Galat	18	1146075,000	63670,833		
Total	23	3611262,500			

Description: (**): Very real effect (Source: Based on SPSS Version 26 Calculation Results)

KK = 27.0959249%

Based on Table 2, it shows that the Fcount of treatment is greater than the F table of treatment. Giving feed treatment between market vegetable waste and pellets has a very significant effect on the body weight gain of rabbits (*Oryctolagus Cuniculus* L.). Because the Anova achieves a coefficient of variance of 27%, it can be continued with Duncan's test as shown in the table 4.5 below:

Table 3. Duncan's Multiple Area Test (WBD) Effect of Feeding Treatment between Pellets and Market Vegetable Waste on Rabbit Weight Gain (*Oryctolagus cuniculus L.*)

Treatment	N	Subset for alpha = 0.05		
		1	2	3
P6	4	542,5000		
P5	4	722,5000	722,5000	
P3	4	742,5000	742,5000	
P4	4		947,5000	
P2	4		1105,0000	
P1	4			1527,5000
Sig.		,303	,063	1,000

Means for groups in homogeneous subsets are displayed.
(Sumber: Berdasarkan Perhitungan SPSS Versi 26)

Based on the Duncan's Multiple Region tests (WBD) results in table 4.5, it states that P1 (100gr pellet feeding) on body weight gain in rabbits is significantly different from P2, P3, P4, P5 and P6. P2 (feeding pellets 80gr + vegetable waste ad libitum) was significantly different from P1 and P6 and not significantly different from P3, P4, and P5. P3 (60gr pellet feeding + vegetable waste ad libitum) was significantly different from P1 and not significantly different from P2, P4, P5, and P6. P4 (40gr pellet feeding + vegetable waste ad libitum) was significantly different from P1 and P6 and not significantly different from P2, P3, and P5. P5 (feeding pellets 20gr + vegetable waste ad libitum) was significantly different from P1 and not significantly different from P2, P3, P4, and P6. P6 (Ad libitum vegetable waste feeding) was significantly different from P1, P2, and P4 and not significantly different from P3 and P5.

Discussion

Based on the results of the Analysis of Variance (ANOVA) test in table 4.1, the effect of feed treatment between pellets and vegetable waste on body weight gain of rabbits (*Oryctolagus Cuniculus L.*) proves that the significance value of Fcount is $7.744 > F_{table} 0.05$. Judging from the comparison results, this means that the feeding treatment between pellets and vegetable waste has a very significant effect on the body weight of rabbits (*Oryctolagus Cuniculus L.*).

Results of Analysis of Variance (Anava), it is known that there are differences between treatments. To see the differences between treatments, further testing was conducted to determine the hypothesis regarding the effect of pellet feed and vegetable waste treatment on rabbit body weight. Because Anava obtained a coefficient of variance (KK) of 27%, further testing is needed in the form of Duncan's Multiple Area Test (WBD). The average rabbit weight data shows a vast difference between all treatments. This shows that the feeding treatment between pellets and vegetable waste significantly affects the rabbits' body weight.

According to the results of Duncan's Multiple Region Test (WBD) in table 4.5, it is stated that P1

(100gr pellet feeding) on body weight gain in rabbits was significantly different from P2, P3, P4, P5 and P6. P2 (feeding pellets 80gr + vegetable waste ad libitum) was significantly different from P1 and P6 and not significantly different from P3, P4, and P5. P3 (60gr pellet feeding + vegetable waste ad libitum) was significantly different from P1 and not significantly different from P2, P4, P5, and P6. P4 (40gr pellet feeding + vegetable waste ad libitum) was significantly different from P1 and P6 and not significantly different from P2, P3, and P5. P5 (feeding pellets 20gr + vegetable waste ad libitum) was significantly different from P1 and not significantly different from P2, P3, P4, and P6. P6 (Ad libitum vegetable waste feeding) was significantly different from P1, P2, and P4 and not significantly different from P3 and P5.

The results of the study showed that the average initial and final body weight of rabbits to both P1 were given feed treatment between pellets and vegetable waste by giving 100gr pellets, P2 80gr pellets + ad libitum vegetable waste, P3 60gr pellets + ad libitum vegetable waste, P4 pellets 40gr + vegetable waste ad libitum, P5 pellets 20gr + vegetable waste ad libitum, P6 + vegetable waste ad libitum showed very significant changes. However, it should be noted that the results obtained in treatment P1 were better than those in treatment P2, P3, P4, P5 and P6. Therefore treatment of 100gr pellet feed results in more effective weight gain in rabbits. Pellet feed in this study showed an excellent response to rabbit weight gain, as shown in table 4.1, that rabbit body weight gain continued to increase along with an increase in protein in each feed treatment.

Rabbit growth is influenced by diet, or the combination of feed consumed. Therefore rabbit feed needs to have good nutritional content. The nutrients in the ration will meet the basic needs of life and the development of organs and tissues in the rabbit's body. Weight gain is greatly influenced by ration consumption because ration consumption determines the supply of rabbits' nutrients, which are used for growth and other purposes (Riyana, 2017).

The results showed that through the application of feed, management based on the availability of feed ingredients, including the selection of feed ingredients, fulfilment of the number of needs and adjustments of feed treatment, so that the productivity of rabbits can increase. The balance between forage feed and concentrate must be considered so that the nutritional needs of livestock can be met (Larasasti, 2016).

According to (Larasasti, 2016), research shows that rabbits fed vegetable waste perform better than those fed grass. In this study, apart from increasing the rabbits' weight, another expected effect is to reduce feed costs by increasing feed efficiency without reducing rabbit performance to reduce production costs and increase rabbit breeders' income. Moreover, in this research, it is also hoped that it can meet the protein needs of the community, which can be obtained from rabbit meat. Moreover, it is also hoped that it can reduce vegetable waste in the market where this waste can cause environmental pollution because there are more and more of them every day. They need to be processed to be valid and reduce environmental pollution.

CONCLUSION

Based on the results of the research conducted, the following conclusions are obtained:

- Feeding vegetable waste is effective as rabbit feed because it can increase the body weight of rabbits (*Oryctolagus Cuniculus* L.).
- The more balanced the market vegetable waste feed in the form of cabbage, carrots, pattern (young corn shoots) and pellets given, the higher the body weight gain of the rabbit (*Oryctolagus Cuniculus* L.).
- Market vegetable waste is not recommended as good feed. However, it can be used as a supplement only because the research results show that market vegetable waste does not have a significant effect.

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