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**THE EFFECT OF FEEDING TAKARA (SOY PULP) AND DAIRY COW FECES FOR *LUMBRICUSRUBELLUS***

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E-mail of Corresponding Author: [hsprayogi@yahoo.com](mailto:hsprayogi@yahoo.com)**ABSTRACT**

The production of earthworm biomass is one of the means to provide nutritive feed source for animal especially for cheap protein feedstuffs. Feeding earthworm with animal's feces leads to low biomass production. Takara is a waste product of tofu industry. It can be used to speed up the production of earthworm. Therefore, this study was conducted to evaluate the combination of takara and dairy feces as earthworm's feed toward the biomass production of *Lumbricusrubellus*. This experiment was carried out based on completely randomized design with five treatments of feed combination between takara and dairy cow feces. The treatments were performed in four replications within three weeks. The result on this study indicates that 75% of takara combined with 25% of dairy cow feces significantly increases the biomass production of *Lumbricusrubellus*. It is not suggested to use 100% of takara as earthworm's feed.

**Keywords:** takara, dairy cow feces, earthworm, biomass production, *Lumbricusrubellus*

**INTRODUCTION**

Since 1997, earthworm was a new commodity started to develop by Indonesian farmer. In its development, there were many researches done to see the potency of earthworm as animal feed and the further product thereof as medication. Prayogi (2011) revealed that adding 10% of earthworm meal in quail feed provide good growth performance indicated by low feed conversion and high body weight gain.

In the production of earthworm, feed for earthworm is the most important part instead of media for their life. Giving a good quality of feed leads to growth of the biomass of the earthworm as well as the number of the cocoon produced. Basically, the feed of earthworm comes from the organic matter had been well decomposed mechanically or biologically, because earthworm has no teeth and absorb the nutrition as simply system. Therefore, the given feed should contain 20% of dry matter and 80% of water.

Generally, the farmer use dairy feces as the natural feed for earthworm, because of economical reason and the availability of source. However, the effect of using this feed toward the biomass production continuously had not been elaborated yet. On the other hand, there are still many waste products from industry having better organic source used as earthworm's feed such as takara (soy pulp). It has high organic content such as protein, fat, and carbon source. To be compared with dairy feces, takara is much more better. Ideally, giving a variety source of feed for earthworm would be better for their growth as well as cocoon production. Based on the direct observation, earthworm more prefer to consume takara than dairy feces. To see the effect by combining these two source of feeds, it is necessary to do a research to prove that takara is better as earthworm feed than dairy feces or the combination in between would be the best.

**MATERIALS AND METHOD**

**Preparation of media and cultivation:** The media used for cultivation was serutankayu had been well fermented for 35 days. The indicator of well done fermentation is the smelt and the texture of the serutankayu. The earthworms were cultivated in the box with 30 x 20 x 15 cm in dimension. Before cultivation, some of the earthworms were put in the media to see whether the media was properly ready to use.

**Feed preparation:** The dairy feces were fermented for 3 days and the soy pulp was fermented aerobically for 1 day using sealed chamber. Before using these feeds, both were opened for five hours to let the feed being cool.

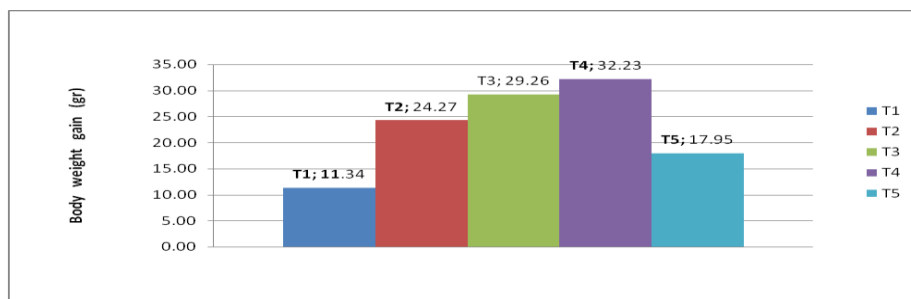
**Earthworm and treatment:** The earthworm used for cultivation was the *Lumbricus rubellus* at the age of two months obtained from the local farmer. Before the cultivation, ten of earthworm weighed and defines as the early weight. The treatment was given for three weeks and then the earthworms were collected and weighed. There were five combinations of feed for the treatment; 100 % of dairy feces (T1), 75% of dairy cow feces combined with 25% of takara (T2), 50% of dairy

feces combined with 50% of takara, 25% of dairy cow feces combined with 75% of takara (T4), and 100% of takara (T5). All the treatments were repeated 4 times.

**Data collection and analysis:** This research was conducted experimentally using completely random design. The data was collected once at the end of the cultivation. The data was analyzed using analysis of variance single factor followed by Duncan test to see the different between the treatments.

**RESULTS AND DISCUSSIONS**

Combination between takara and dairy feces really affect the growth of the earthworm. Using 100 % of dairy feces gave poor growth performance of the earthworm as it was only 11.34 gr. More percentage of the takara added, higher biomass production was achieved. However, the using 100% of takara slows the growth of the earthworm (see tabel 1). It was look like that using 75% of takara combined with 25% of dairy feces would be the best combination as it gave highest mass production. A better picture of the growth among the treatments was presented on picture 1.



**Picture 1: The graph of body weight gain on all treatments**

**Table 1: The average of body weight gain of lumbricus rubellus for three weeks. The different of supperscript indicate a significant different among the treatment (P<0.01)**

Treatment	Number of Repeat				total	Average	Stdev
	1	2	3	4			
T 1 (100% dairy feces)	9,97	10,84	12,56	11,98	45,34	11,34 <sup>a</sup>	1,16
T 2 (25% takara + 75% dairy feces)	20,24	26,71	23,90	26,24	97,08	24,27 <sup>c</sup>	2,96
T 3 (50% takara + 50% dairy feces)	30,43	27,03	31,77	27,82	117,05	29,26 <sup>d</sup>	2,21
T4 (75% takara + 25% dairy feces)	30,55	34,43	33,93	30,01	128,92	32,23 <sup>d</sup>	2,27
T 5 (100% takara)	18,79	17,18	18,87	16,96	71,80	17,95 <sup>b</sup>	1,02

Based on the analysis of variance, It was found that combination between takara and dairy feces give a significantly affect the growth performance of earthworm which mean that combination between takara and dairy cow feces give significant different to the biomass production. The Duncant test showed that T1 was different with T2, T3, T4, T5. However, there was no difference between T3 and T4. This indicates that using 50% and 75% of takara as earthworm feed would give almost the same performance.

This study showed that takara was a better feed source for feeding earthworm up to 75% in combination with 25% of dairy cow feces. Using 100% of takara as feed are going to decline the biomass production and are not suggested. Although takara is more nutritious than dairy cow feces but it acidifies the earthworm's habitat. Furthermore, using more takara, consequently, are going to add more water to the artificial habitat that make uncomfortable for the earthworm. Based on the protein content, takara has more value as 30,2 % from dried matter (Sutardi, 1997). This protein is going to be degraded by microorganism during the decomposition process (Achmad, K.T.B, at all, 2010). However, Protein content is not the one parameter for better biomass production. It isalso assumed that the combination would influence the porosity and the C/N ratio of the artificial life media that make the earthworm become more comfortable. Therefore, It would be more interesting to study the composition of organic matter on the combination these two waste products.

## CONCLUSION

Combination between 75% of takara with 25% of dairy cow feces as earthworm feed gives the best performance of biomasproduction. Adding more procentase of takara in combination with dairy cow feces could improve the biomas production.

However, Feeding with100% of takara could decline dramatically the biomas production.

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