



## The Influence of Utilization of Sweet Potato Leaves (*Ipomoea batatas*) as an Eating Feed to Increase the Body Weight on Goat Crossbreed of Ettawa

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### Abstract

Sweet potato leaf (*Ipomoea Batatas*) is a potential agricultural waste is used as animal feed to Goat crossbreed of Ettawa. Sweet potato leaf (*Ipomoea Batatas*) has a high enough protein content (> 20%), so it can be used as a source of protein goat crossbreed of Ettawa. This research aims to determine the effect of feeding of sweet potato leaves (*Ipomoea Batatas*) as feed on goat body weight of goat crossbreed of Ettawa. This research has been conducted in February to March 2015, located in Wonua Raya village, Toari district, Kolaka Regency. This research uses 12 goats crossbreed of Ettawa which is divided into 12 plots of cages. In this research, four levels of feeding treatment were applied: regular feed/Gamal leaf (R0), 90% Gamal leaves + 10% sweet potato leaves (R1), 85% Gamal leaves + 15% sweet potato leaves (R2), 80 % Leaf Gamal + 20% sweet potato leaves (R3). The results showed that the use of sweet potato leaves on weighing 15 days did not significantly affect the rate of body weight and had a significant effect on considering at day 30 ( $p < 0,05$ ) on goat weight of goat crossbreed of Ettawa. This research showed that the use of sweet potato leaves (*Ipomoea Batatas*) as much as 20% can be given to crossbreed of Ettawa goat without any adverse effect.

**Keyword:** goat crossbreed of Ettawa, sweet potato leaves, body weight

### A. Introduction

Sweet potato (*Ipomoea Batatas*) is one of the most significant agricultural products in Indonesia. Sweet potatoes are generally cultivated in the tropics and sub-tropics are not only consumed by humans but also can be used as animal feed. Although sweet potatoes are grown from tubers, sweet potato leaves are also a source of vegetable protein that can be consumed as vegetables. Protein content in sweet potato leaves is higher than the protein present in the tubers, so that sweet potato leaves are very well used for fodder. The utilization of sweet potato leaves as animal feed has been widely practiced in several countries, namely China and Taiwan as well as in some regions in Indonesia such as Bali, North Sumatra, Toraja (South Sulawesi), and Papua. In general, sweet potato leaves can be used as pig, cow and goat feed.

Based on statistical data, the level of sweet potato production in Indonesia in 2007 reached 1.886 million tons with a harvest area of 176.93 thousand hectares (BPS, 2008). Sweet potato or commonly referred to as sweet potatoes is included in the type of crops planted as the

second crop in a dry season. Where the sweet potato crop is very often, we find with a relatively low price.

We know there are several types of sweet potatoes. The most common species we find are white, red, purple, yellow or orange sweet potatoes. The content of sweet potato leaves that contain strong antioxidants to neutralize free radicals, other nutrients are also found in sweet potato leaves are energy, vitamin C, vitamin B6 (pyridoxine) that play an essential role in the immune system. Inside the sweet potato leaves also contain minerals such as phosphorus, calcium, manganese, iron, and soluble fiber to absorb excess fat. So, it is very suitable to be used as animal feed (Reifa, 2005).

A goat crossbreed of Ettawa system cannot be separated from five livestock business, namely: seeds, feed, cage, disease and maintenance management. These five are the control of the success of the livestock business. A goat crossbreed of Ettawa is one of the leading commodities in Kolaka District, especially in Tory Sub-district. The Toari Subdistrict is one of the sub-districts located in the southern Kolaka Regency that has the characteristics of the western region situated on the edge of the coast and the contour of a hilly area with sufficient rainfall for the plants which is one of the favorable factors in the supply Forage (HMT).

This region is partly comprised of transmigration communities from Java and Bali island as well as migrants from South Sulawesi that almost 90% of the people work as farmers and ranchers. One of the most significant agricultural products in Wonua Raya Village is sweet potato (*Ipomoea Batatas*). Post-harvest sweet potato, farmers usually remove the leaves of sweet potatoes because that is purchased by merchant only the sweet potato. From there the authors think to use the leaves of sweet potatoes as goat crossbreed of Ettawa feed so that the breeders are not difficult anymore to find fodder for goat cattle. Also, livestock gets different feed so that calves do not feel bored. Based on the above ideas, the authors are interested in researching with the title "The Influence of Utilization of Sweet Potato Leaves (*Ipomoea batatas*) as an Eating Feed to Increase The Body Weight on Goat Crossbreed of Ettawa."

## **B. Methodology**

### *1. The Materials*

This research used 12 goats crossbreed of Ettawa which were divided into 12 plots/cages and divided into four treatments so that each treatment consisted of 3 jets crossbreed of Ettawa found in Wonua Raya Village Toari district Kolaka Regency. The materials used are Gamal leaves, sweet potato leaves, water, and worm medicine. The tools used are a bucket, scales, machetes, and *others*.

### *2. Research Procedures*

The design used in this research is complete randomized design four treatments three replications that is:

R0 = Normal feed (Gamal leaves)

R1 = 90% Gamal leaves + 10% sweet potato leaves (*Ipomoea batatas*)

R2 = 85% Gamal leaves + 15% sweet potato leaves (*Ipomoea batatas*)

R3 = 80% Gamal leaves + 20% sweet potato leaves (*Ipomoea batatas*)

## **C. Result and Discussion**

### *1. Initial Body Weight*

The initial body weight is the weight of the goat crossbreed of Ettawa livestock obtained by weighing the cattle before being given treatment. The results of observation of goat crossbreed of Ettawa body weight before being given the treatment received in the research are listed in Table 1.

Table 1 showed that the sampling is done randomly. With the criteria of Goat crossbreed of Ettawa aged around 7-9 months, all the samples used were male cattle, because in this experiment conducted animals fattening test.

**Table 1. Weight before treatment (kg / head)**

Before Treatment	The label of goat crossbreed of Ettawa	Body weight
R0	R01	10,00
	R02	11,00
	R03	10,50
R1	R11	11,00
	R12	10,20
	R13	11,80
R2	R21	10,20
	R22	10,70
	R23	11,00
R3	R31	10,00
	R32	11,40
	R33	10,60

### 2. Body Weight Day 15

The results of observation of goat crossbreed of Ettawa weight from each treatment are listed in table 2.

**Table 2. Body weight of day 15 (kg/head) of livestock from each treatment.**

Deuteronomy	Treatment			
	R0	R1	R2	R3
1	12,20	12,90	13,80	13,30
2	13,00	12,30	13,00	14,00
3	12,50	14,00	14,10	13,90
Total	37,70	39,20	40,90	41,20
Average	12,57	13,07	13,63	13,73

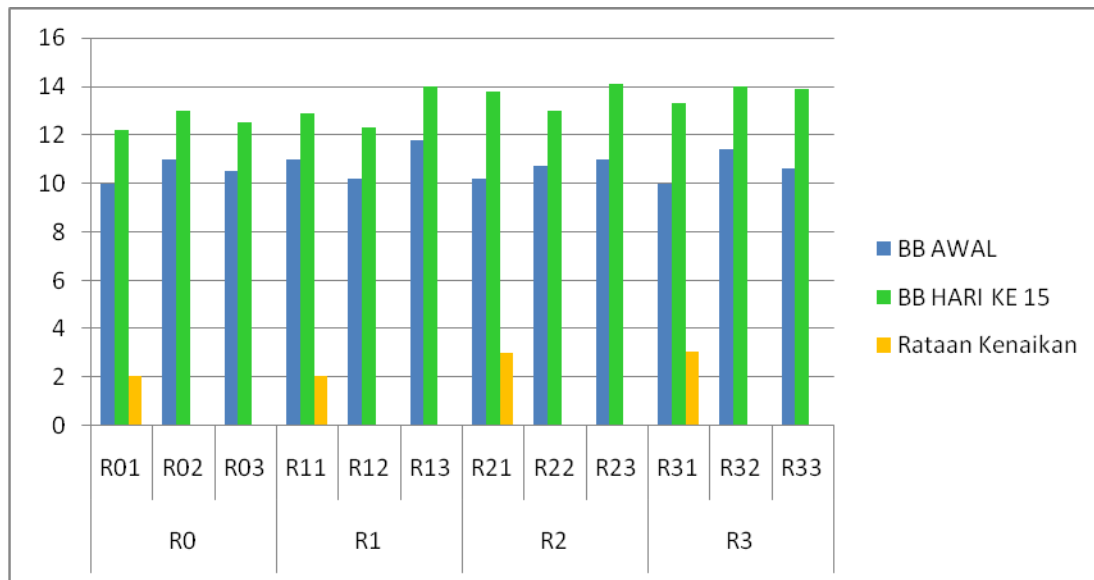
From the results of the above research shows that there is the effect of feeding of sweet potato leaves, while the observations showing the weight gain of body weight measurement and measurement after treatment, i.e., weighing at day 15, can be seen in table 3.

**Table 3. Comparison of initial body weight and body weight of day 15 (kg/head).**

Treatment	Label of Goat	Body weight	Body Weight Day-15	Total	Average Rise
R0	R01	10,00	12,20	2,20	2,07
	R02	11,00	13,00	2,00	
	R03	10,50	12,50	2,00	
R1	R11	11,00	12,90	1,90	2,07
	R12	10,20	12,30	2,10	
	R13	11,80	14,00	2,20	
R2	R21	10,20	13,80	3,60	3,00
	R22	10,70	13,00	2,30	
	R23	11,00	14,10	3,10	
R3	R31	10,00	13,30	3,30	3,07
	R32	11,40	14,00	2,60	
	R33	10,60	13,90	3,30	

In the above observation, results show that the effect of normal feeding (Gamal leaves) and sweet potato leaves (*Ipomoea Batatas*) with various levels of feed percentage. In the column, R0 is given regular feed (Gamal leaf) which is given in general. Based on observations of feeding of Gamal leaves, it was found that R01 (10.00, 12.20), R02 (11.00, 13.00), R03 (10.50; 12.50) with an average increase of 2.07 kg. On a result of observation R1 given feed with treatment level equal to 90% normal feed (Gamal leaf) + 10% feed of sweet potato leaves (*Ipomoea batatas*). The results are R11 (11.00, 12.30), R12 (10.20; 12.30), R13 (11.80,14.00)

with an average of 2.07 kg. Furthermore, on the results of observation R2 given a feed with an 85 % level of normal feed (Gamal leaves) + 15% feed sweet potato leaves. R21 (10,20; 13,80), R22 (10,70; 13,00), R23 (11,00; 14,10) with average increase of 3,00 kg. While the result of observation R3 given feed with level 80% normal feed (Gamal leaf) + 20% feed of sweet potato leaves, got result of R31 (10,00,13,30), R32 (11,40,14,00) R33 (11.60; 13.90) with an average increase of 3.07 kg. In addition to the above observations, the comparison of initial body weight gain and body weight of day 15 can also be seen in graph 1.



**Picture 1. The comparison of initial body weight gain and body weight of day 15.**

On the graph above shows the initial body weight is denoted by the blue color where the value is only around 10-11 kg, and there is an increase in weighing 15th day, which is indicated by green color, and the rise in symbol is indicated by yellow, which clearly shows the highest rate of growth in R3 treatment, followed by R2 and R1.

It is clear that the weight of goat crossbreed of Ettawa bodies increased from 15 days after being given the treatment of feeding with various levels of feed percentage.

### 3. End Body Weight

The final body weight is the result of weighing on the 30th day during the research, while the weighting result of Goat crossbreed of Ettawa from each treatment is shown in table 4.

**Table 4. Body weight of day 30 (kg/head) of livestock from each treatment.**

Deuteronomy	Treatment			
	R0	R1	R2	R3
1	14,00	15,20	15,00	16,00
2	15,10	14,40	15,80	17,50
3	14,50	16,10	16,00	17,00
Total	14,53	15,23	15,60	16,83
Average	14,00	15,20	15,00	16,00

From the results of the above research shows that there is the effect of feeding of sweet potato leaves (*Ipomoea Batatas*), as to the results of observations showing the increase of body weight from the initial body weight measurement and the measurement after best treatment was weighing on the 15th day or the 30th day, can be seen in table 5.

Table 5. showed that there is an increase in the effect of feeding of sweet potato leaves (*Ipomoea Batatas*) with various levels of feed percentage. In the column, R0 is given regular feed (Gamal leaf) which is given in general. Based on the results of observations of feeding of Gamal leaves, it was found that R01 (10.00, 12.20, 14.00), R02 (11.00, 13.00, 15.10), R03 (10.50; 12,50; 14, 50) with an average increase of 4.03 kg. On a result of observation R1 given feed with treatment level equal to 90% normal feed (Gamal leaf) + 10% feed of sweet potato leaves (*Ipomoea Batatas*). The results are R11 (11,00,12,30; 15,20), R12 (10,20,12,30; 14,40), R13

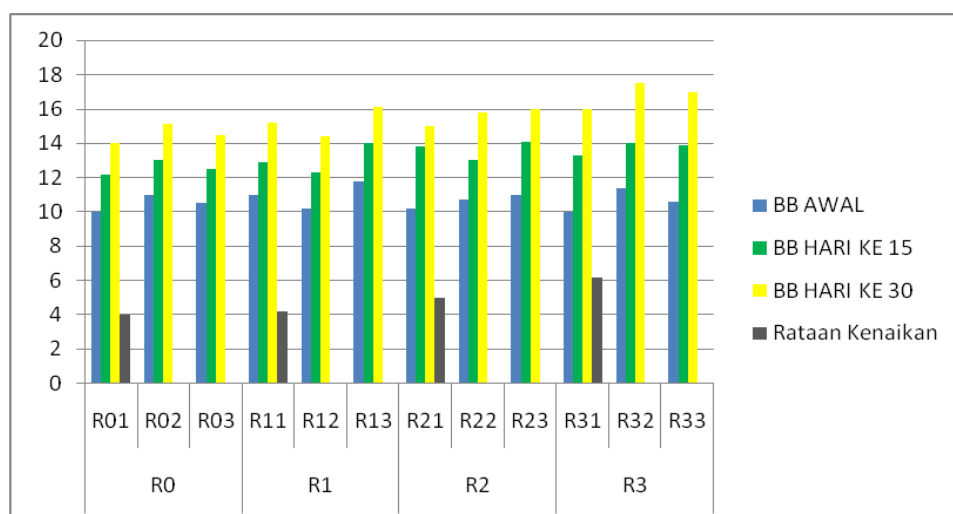
(11,80,14,10,16,10) Average increase of 4.23 kg. Furthermore, on the results of observation R2 given a feed with 85% level of normal feed (Gamal leaf) + 15% feed sweet potato leaves (*Ipomoea Batatas*). R21 (10,20; 13,80; 15,00), R22 (10,70,13,15,15,80), R23 (11,00,14,10,16,00) with average an increase of 4.97 kg. While the result of observation R3 given feed with level 80% normal feed (Gamal leaf) + 20% feed of sweet potato leaves (*Ipomoea Batatas*), got result R31 (10,00,13,30; 16,00), R32 (11, 40; 14,00; 17,50), R33 (11,60; 13,90; 17,00) with an average increase of 6.17 kg. From the three tables above the initial weight table, body weight 15th day and final weight can be seen clearly that each treatment has increased, where the level of increase is R0 (4.03), R1 (4.23), R2 (4.97), R3 (6.17). On the average increase, it has been explained that R0 is the normal feed (Gamal leaf), R1 is fed with 90% percentage of Gamal leaves + 10% sweet potato leaves (*Ipomoea batatas*). R2 is fed with percentage 85% leaves of Gamal + 15% of sweet potato leaves (*Ipomoea batatas*). For R3 is fed with percentage 80% of Gamal leaves + 20% sweet potato leaves (*Ipomoea batatas*).

Livestock needs good quality feed as Williamson & Payne (1999); Juniar & Simanihuruk (2010); and Ruiz (1982) that feed that had the best quality can influence grow of livestock nutrient.

**Table 5. Comparison of initial body weight, the body weight of day 15 and body weight of day 30 (kg/head).**

Treatment	Goat label	Body weight	Body weight day-15	Body weight day-30	Total	Average rise
R0	R01	10,00	12,20	14,00	4,00	4,03
	R02	11,00	13,00	15,10	4,10	
	R03	10,50	12,50	14,50	4,00	
R1	R11	11,00	12,90	15,20	4,20	4,23
	R12	10,20	12,30	14,40	4,20	
	R13	11,80	14,00	16,10	4,30	
R2	R21	10,20	13,80	15,00	4,80	4,97
	R22	10,70	13,00	15,80	5,10	
	R23	11,00	14,10	16,00	5,00	
R3	R31	10,00	13,30	16,00	6,00	6,17
	R32	11,40	14,00	17,50	6,10	
	R33	10,60	13,90	17,00	6,40	

Based on the results of the above-average rate of increase can be interpreted that the treatment of R3, i.e., feeding with a percentage of 80% of Gamal leaves + 20% sweet potato leaves (*Ipomoea Batatas*) increased body weight higher than R0, R1, and R2. Comparison of initial body weight, the body weight of day 15 and body weight of day 30, can be seen in graph 2.



**Picture 2. Comparison of initial body weight, the body weight of day 15 and body weight of day 30 (kg/head).**

In the graph, there are four color labels, namely blue for initial body weight, green color for body weight 15th day, yellow for body weight 30th day, and black color for weight increase body weight. In the above grille, the most striking green line is R3 which means that the increase of body weight in the feeding treatment with the percentage level of 80% of Gamal leaves + 20% of sweet potato leaves (*Ipomoea Batatas*) is higher than the treatment of R2, R1 or R0.

It can also be seen in the graph that weighing the body day-30, i.e., the yellow color line has increased rapidly that occurs in treatment R3 ranges in numbers 17 and above. The average increase in body weight seen in the graph with the black color line that became the highest line that is in the treatment of R3 which ranges in the number 6 and above.

So, it can be proved in the table and in the graph that the treatment of R3 (80% leaves of Gamal + 20% sweet potato leaves) has increased higher than feeding with presentation level R2, R1, and R0.

#### **D. Conclusion**

The feeding with the percentage of 80% leaves of Gamal + 20% sweet potato leaves (*Ipomoea Batatas*) had a positive effect on the weight of the goat crossbreed of Ettawa.

#### **4. References**

- BPS [Badan Pusat Statistik]. (2008). *Statistik Indonesia 2007 (Produksi Umbi-umbian di Indonesia)*. Jakarta, Indonesia: BPS.
- Reifa. (2005). *Ubi Jalar Sehatkan Mata dan Jantung, serta Mencegah Kanker*. Yogyakarta, Indonesia: Kanisius.
- Ruiz, M. E. (1982). *Sweet potato (Ipomoea batatas L.) for beef production, agronomy. Conservation aspects and animal responses In Villareal, R. L. and T. D. Griggs (Eds), Sweet Potato*. Proceeding of the First International Symposium AVRDC. Taiwan. R. O. C. 44, pp. 439-451.
- Juniar, S., & Simanihuruk, K. (2010). *Potensi Dan Pemanfaatan Daun Ubi Kayu Dan Ubi Jalar Sebagai Sumber Pakan Ternak*. Medan, Sumatra Utara: Universitas Sumatera Utara, pp. 75-84.
- Williamson, G., & Payne, W. J. A. (1999). *Pengantar Peternakan di Daerah Tropis. Edisi Ke 3*. (Diterjemahkan oleh S.G.N.D. Darmadja). Yogyakarta, Indonesia: Gadjah Mada University Press.