

# The Effect of Granting Banana Shoe Stem (*Musa Paradisiaca Forma Typica*) on the Increased Body Weight of Bali Cattle (*Bos sondaicus*)

Umbang Arif Rokhayati <sup>1</sup>

<sup>1</sup> Lecturer of the Department of Animal Husbandry,  
Faculty of Agriculture, Gorontalo State University

**Abstract:-** This study aims to determine the weight increase of Balinese cattle to the silage of banana shoe stems. The study was conducted in March to April 2019 in Dambalo Village, Tomilito Subdistrict, North Gorontalo Regency. The research site had a capacity of 50 cattle but this study used 20 cows which were divided into 2 groups. The first group as control was given 15 kg of elephant grass and then added 1 kg / head / day of fresh banana feed and the second group was given 15 kg of elephant grass and 1 kg/head/day of banana shoe silage feed treatment. While processing data using the t test. The results showed that the banana shoe stem silage feed was significantly different ( $P > 0.05$ ) to the value of the weight increase or preferred by Balinese cattle. Whereas the value of body weight gain is higher in cattle given banana silage feed compared to Balinese cattle which are fed fresh banana stems, where the average weight gain of Bali cattle is 42 to 57 grams /head /day. The conclusion is that the treatment of banana shoe stem fermentation was significantly different ( $P > 0.05$ ) to the palatability of Balinese cattle.

**Keywords:-** Bali Cattle, Fermentation, Palatability.

## I. INTRODUCTION

Bali cattle are Indonesian beef cattle and are the result of domestication from Banteng (*Bos-bibosbanteng*) (Hardjosubroto, 1994), and are native to Bali. Bali cattle are excellent beef cattle in Indonesia because they have high reproductive capacity, and can be used as working cattle in fields and fields (Putu *et al.*, 1998; Moran, 1990), high carcass percentage, lean meat, high positive heterosis in crossbreeding (Pane, 1990), high adaptability to the environment and the percentage of births can reach 80 percent. Bali cattle are ruminant animals that have four compartments, namely rumen, reticulum, omasum and abomasum. So that the digestive system in cattle can utilize feed that has a high crude fiber content. Therefore cows can consume large amounts of forage.

The Feed is one of the most important factors in livestock raising business. The success of livestock raising is determined by the feed given. The reality in the field shows that there are still many breeders who provide feed to livestock without regard to the quality, quantity and

method of providing these rations. As a result, the growth or productivity of livestock that are kept is not optimal. In fact, many farmers suffer losses due to imperfect feeding.

Beef cattle need a source of protein in the ration that they consume everyday. The source of the protein can come from vegetable protein or can also come from animal protein. Vegetable protein can be derived from plants or derived from forage given in feed while animal protein can come from the body of a cow made from inside the cow's rumen.

Not many people know about the benefits of agricultural waste in the form of banana stems. Even though many banana stems contain carbohydrates, because banana *gedebok* contains carbohydrates that can be used by livestock as a source of food.

Based on the description above, the authors conducted a palatability test for beef cattle using fermented feed from stems of banana shoe or *kepok* (*Musa paradisiaca forma typica*) to find out the extent of beef cattle's preference for banana rod fermentation.

## II. RESEARCH METHODS

This research was conducted on March 1, 2019 until April 1, 2019. The research location was in Dambalo Village, Tomilito District, North Gorontalo District. The number of animals used in this study amounted to 20 animals. Cattle are grouped into two, 10 animals are used as control, they are given additional feed in the form of banana stems without fermentation. 10 animals are used as treatment animals, which are given additional feed fermented banana stems. The cattle used in this study were Bali female cows.

## III. RESULTS AND DISCUSSION

### ➤ *Banana Stem Silage*

There are two types of treatment feed given to Bali cows, namely stems fresh bananas and banana stems fermented or silage. There are different types of nutrient content of banana stems in different types of bananas, we can see in table 1 below.

Feed ingredients	BK (%)	Ash (%)	PK (%)	SK (%)	LK (%)	BETN (%)
Banana Shoe Stems	87.7	25.12	3.01	29.40	14.23	28.24
Ambo Banana Stems .	80.0	19.50	1.01	19.50	0.75	59.24
King Banana Stems	82.0	22.03	2.00	23.14	5,00	22.35

Table 1:- Difference in nutrition of banana stems in 3 types of bananas  
Source : 2019 processed data results .

Based on the table above researchers took the stem of banana footwear to be materials research, in addition to the content of the nutrients that a good amount of waste of agriculture in terms of this stems of banana shoe are very abundant in the village dambalo subdistrict tomilito district of Gorontalo north. Silage stem of bananas is one of the products processed feed cattle were sourced from waste agricultural namely in the form of rods banana added molasses as a starter and some materials more and do

ferment for three days. The purpose of making silage is to preserve feed ingredients and maximize the nutrients in these feed ingredients. It is in accordance with the statement (Center for Research and Placembang 's Agriculture 2015) that the success of making silage is meant to maximize the nutrients that can be preserved. Both types of feed that has a difference either in the physical or chemical, such as that presented in Table 2 at the bottom of this.

Physical and chemical properties of feed ingredients	Fermented banana stems	Trunk bananas without fermentation
Smell	The smell of acidity	not smelling
Colour	Brown Young greenery	Greenish white
Mushroom	Not contained mushrooms	Not contained mushrooms
Texture	Whole and smooth	Soft

Table 2:- Differences in feed given to the treatment  
Source : 2019 Processed Data Results .

Based on Table 2 at the top, seen that the silage that is produced has a quality good. It is in line with the opinion Haustein (2003) which states that the quality of the silage that quality good is coloured green -brown or brown light, flavorful acid, textured smooth and intact. In general silage that is generated in the research is coloured brown greenish, not encountered silage which is coloured brown dark or black, because the more dark silage that produced the quality of the silage is getting low (Despal et al . , 2011).

sources of carbohydrates are missing and digestibility of protein low.

The silage produced in this study smelled of acidity, but was fresh and delicious. The smell of acid is caused by anaerobic bacteria (lactic acid bacteria) actively working to produce organic acids (Siregar, 1996). While the resulting texture is solid and smooth. Also added that the characteristics of a good silage texture is still intact as the beginning of the production. The silage texture can become soft if the forage water content or the material used in making silage is still high enough, so that silage produces a lot of water. Before making silage, banana stems must be withered first to reduce the water content.

Changes in colour that occurs during the process of fermentation is caused by changes that occur in the plant because the process of respiration aerobic that took place during the supply of oxygen is still there (Reksohadiprodjo, 1988). Sugar will be oxidized into CO<sub>2</sub>, water and heat so that the temperature rises. If the temperature is not controlled, the silage will be coloured dark brown to black. It causes a decrease in the value of the feed as many

Following is the average consumption of Bali cattle feed between results of fresh banana stems and banana stem silage presented in diagram 1 below.

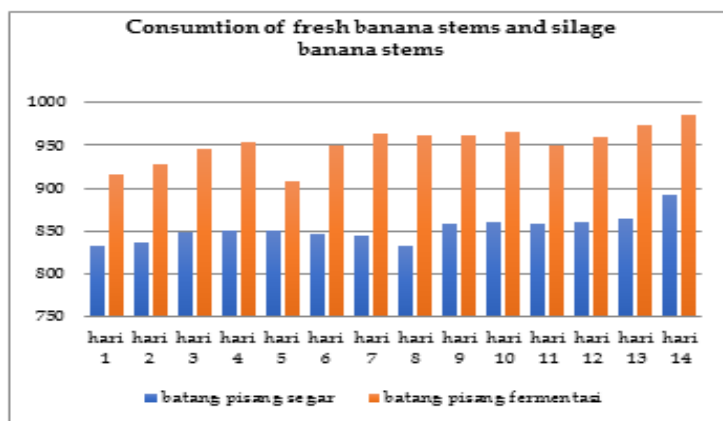


Fig 1:- Consumption of fresh banana stem feed and silage of banana stems. Data Primary: 2019.

The t-test results showed that, shoe banana stem silage had a significant effect ( $P > 0.05$ ) or was preferred by Bali cattle compared to fresh shoe banana stem feed. This is influenced by the characteristic texture and odor produced. This is consistent with the statement of Rizkiyah and Agustina (2016) that the physical form of the feed, finely chopped feed can increase the level of consumption, accelerate mastication where it is reported that the shorter length of the chopped allows the compaction to occur when making silage, resulting in a more perfect fermentation process by microorganisms. The digestibility of silage that is chopped is higher than that which is not chopped. This is consistent with the opinion of Church and Pond (1988), stating that palatability which includes the texture, odor, taste, and temperature of the feed given, affects the level of consumption.

Perez, R. (1983) states that molasses contain a lot of carbohydrates as a source of energy and minerals, both macro and micro minerals, so as to stimulate microbial growth in the rumen which results in cattle being able to digest crude fiber. Molasses can improve the formula to be more compact, contain high energy, can increase palatability and flavor and increase microbial activity in the rumen. Molasses is widely used in cattle feed to increase appetite. So that Bali cattle in studies that have a high level of palatability are given banana stem silage feed.

#### ➤ Increased Body Weight

The daily body weight gain of Bali cattle is obtained from the result of weighing the final body weight minus the initial body weight divided by the interval of weighing once every 7 days. Comparison of the average body weight gain of Bali cattle between those fed silage banana stems and those given fresh banana stems during the study can be seen the figure below: Based on the picture above, it is seen that the body weight gain of Bali cows given banana stem silage is higher than that of Bali cows given fresh banana stem feed. Daily body weight gain in cows given silage in the first week was 42 grams / head / day and in weeks 2 to week 4 it reached 57 grams / head / day while in cows given fresh banana stems only increased by 14 grams / head / day. This significant difference occurs because the silage of banana stems has more complete nutrition when compared to fresh banana stems. In addition, banana stem silage is composed of various types of feed ingredients, such as molasses and rice bran.

This is in line with the opinion of Garsetiasih *et al.*, (2013) which states that rice bran can be used as concentrate food that contains a lot of energy and livestock preferred. Rice bran has nutritional content, namely BK 86.5%, ash 8.7%, PK 10.8%, crude fiber 11.5 %, fat 5.1%, BETN 50.4%, calcium 0.2% and phosphorus 2.5%. Giving rice bran as reinforcement feed for ruminants can provide good growth, large fast and fat cattle.

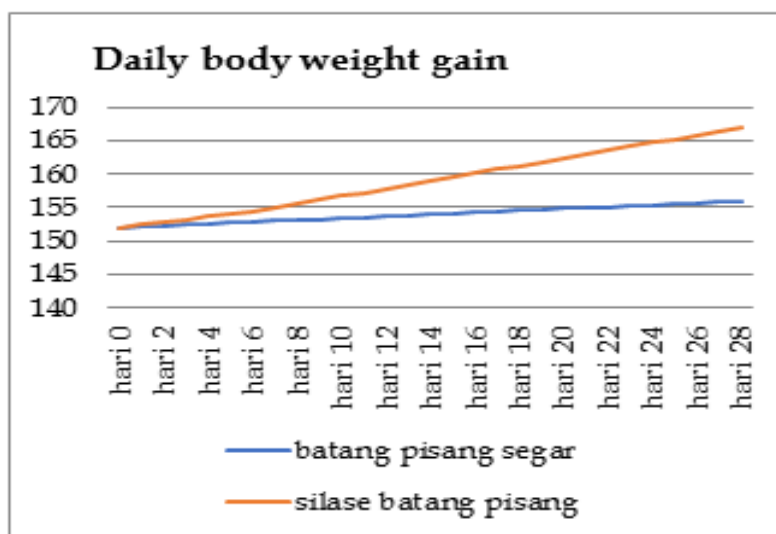


Fig 2:- Daily body weight gain

Body weight gain during the study can be seen in Figure 2 with the average weight gain in the first week of 42 grams / head / day (3 kg / head / week) and 57 grams / head / day (4 kg / head / week). This average weight gain is lower when compared with the statement of Mastika (2003) that genetically the growth rate of Bali cattle is slower than Madura cows, but by providing good quality feed Bali cows are able to grow with daily body weight gain of 660 grams / day at the age of growth.

Also added by Soedjana *et al.*, (2012) which states that Bali cattle have deficiencies that are relatively slow growth. However, Balinese cattle have an adaptive advantage to the tropical environment, are able to live with low quality feed and strong resistance to disease. Tomaszewska *et al.*, (1993) stated that the rate of body weight gain of cattle is influenced by age, the initial body weight of the fattening phase is related to adult weight if the growth of cattle at the beginning of fattening is good, then the growth of cows to the peak will also be good. The feed given is also a factor affecting the weight gain of Bali cattle, both in terms of quality and quantity.

#### IV. CONCLUSION

Based on the results of the study showed that the silage of shoes banana stems (*Musa paradisiaca forma typica*) was significantly different ( $P > 0.05$ ) to the palatability of Balinese cows (*Bos sondaicus*), or preferred compared to fresh banana stem feed. Shoe banana silage silica (*Musa paradisiaca forma typica*) further increases the body weight of Bali cows compared to fresh banana stems where the average weight gain of Bali cows is 42 to 57 grams /head /day.

#### SUGGESTION

My suggestion is that further research needs to be done on the fermentation time of banana rods silage, on the physical and nutritional quality of silage of banana stems.

#### REFERENCES

- [1]. Research and Development of Agriculture . 2015. Forage Preservation by Silage Method for Ruminant Animal Feed . Online <http://nad.litbang.pertanian.go.id/ind/index.php/info-teknologi/714-preservation-green-with-the-way-to-feed-silage-ruminant-animal-> accessible on the date of May 5, 2019 at 20:00 pm .
- [2]. Church, DC and WG Pond. 1988. Basic Animal Nutrition on Feeding. Edition to 3. John Wiley & Sons, New York. 13,45,117.
- [3]. Despal , IG Permana , SN Safarina , & AJ Tatra. 2011. Use of Various Sources of Carbohydrates Dissolved Air to Improve the Quality of Silage Leaf Rami. Animal Husbandry Media Vol 34 (1): 69-76. Garsetiasih , et al . (2013). Utilization of bran rice as an ingredient feed livestock.
- [4]. Hardjosubroto , W. 1994. Application of Breeding Livestock in the Field. Jakarta: PT. Gramedia Widiasarana Indonesia .
- [5]. Haustein , S. 2003. Evaluating silage quality. {Online} <http://www.agric.gov.ab.ca>. Accessed May 5, 2019.
- [6]. Lawrence, TLJ 1990. Influence of Palatability on Diet Assimilation in Non-Ruminants in Wiseman, J and PJ A Cole (Editor). 1990. Feedstuff University Press. Cambridge : 115 - 141.
- [7]. Mastika ( 2003). The rate of growth between Bali Cattle and Madura Cattle.
- [8]. Moran JB, 1990. Performans of cows broiler in Indonesia in the Condition Management of Traditional and Improved. Ruminansia Seminar Report II. Bogor: Animal Research and Development Center .
- [9]. Pane, I. 1990. Efforts to improve the genetic quality of Bali cattle in P3 Bali. Proceedings of the Bali National Cow Seminar .Bali, 20-22 September 1990.
- [10]. Perez, R. 1983. Molasses. Tropical Feeds and Feeding Systems.
- [11]. Putu, IG, P. Situmorang , A. Lubis , TD Chaniago , E. Triwulaningsih , T. Sugiarti , IW Mathius and B. Sudaryanto . 1998. Effect of giving .
- [12]. Reksohadiprodjo , S. 1988. Shepherd Animal Feed . Yogyakarta: BPFE UGM.
- [13]. Rizkiyah and Agustina (2016) Effects of Form Feed against the level of consumption of livestock.
- [14]. Siregar SB 1996. Concept of Fodder Regulation on Standards for Dairy Cattle. Space Business. Bandung.
- [15]. Soedjana TD, Bahri S, Diwyanto K, Priyanti A, Ilham N, Muharsini S, Tiesnamurti B. 2012. Measuring the potential supply of beef and buffalo in the country towards self-sufficiency in 2014. Center for Animal Husbandry Research and Development. Agency for Research and Development of Agriculture, Ministry of Agriculture . Jakarta (ID): Iaad Pr
- [16]. Tomaszewska , MW, JM Mastika , A Djaja Negara, S. Gardiner, and TR Wiradarya . 1993. Goat and Sheep Production in Indonesia, Eleven March, Press University, Surabaya.