

Feeding Maize Straw Silage and Concentrate to Bali Cattle Cow in South Sulawesi

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ABSTRACT

Study was conducted at the Livestock Farms in Pinrang 2015. The purpose of the study was to improve Bali cattle cow feeding with maize straw silage and concentrate. The study used 20 Bali cattle cow with the age of about 2.5-3 years and an average weight of 200 kg, were divided into four treatments with five replicates, namely: (A) Maize straw silage 30% + elephant grass 60% + concentrate 10%; (B) Maize straw silage 50% + elephant grass 40% + concentrate 10%; (C) Maize straw silage 70% + elephant grass 20% + concentrate 10%; (D) Maize straw silage 100% + concentrate 10%. The results showed the protein content of maize straw silage was 9.30% with crude fiber content of 25.14% and 1.63% of fat. Treatment B and C gave weight gain of 0.32 kg/head/day, treatment D of 0.30 kg/head/day, and the lowest weight gain was treatment A 0.23 kg/head/day. Feed consumption maximum was 6.36 kg/head/day obtained from treatment B followed by treatments D, C, and A respectively 6.18 kg/head/day, 5.45 kg/head/day and 5.28 kg/head/day. The lowest feed conversion obtain from treatment C was 17.03, then a treatment B, D, and A with respective values of 19.8, 20.6, and 22.9. It can be concluded that feeding maize straw silage up to 100% as a forage source, supplemented by concentrate as a protein source were able to improve the body condition of the Bali cattle cow.

Key Words: Feeding, Bali Cattle, Maize, Silage

INTRODUCTION

South Sulawesi is one of the areas potential for cattle development, especially beef cattle. Although the cattle population in this area is starting to increase, but it is still not optimal, on the other hand its genetic quality decreased, especially Bali cattle, as characterized by increasing number of low birth weight, low mature weight, slow growth rate of the calf and the low birth rate (Wello 2008).

One of the causes of declining population and the low productivity of beef cattle is the poor reproductive performance of cows as indicated by a low pregnancy rate. In addition, live weight of the cow decreased drastically in early lactation and growth calves were less than optimal resulted from inadequacy nutritional requirement (Antari et al. 2010). To improve the productivity of beef cattle, it requires better management of maintenance and increased feed quality.

The availability of feed ingredients in the tropical regions such as in Indonesia is very fluctuating depending on the season. In the rainy season, forage availability is relatively abundant, in contrast in dry season forage availability is very limited and the quality is low. It influenced on the improvement of livestock production. Utilization of agriculture by-product is one of the alternatives to overcome the limitations of forage availability. One of agricultural by-product available continuously throughout the year and low cost price is maize straw.

South Sulawesi as one of the centers of production of maize and has very important role in supporting national food security. Maize by-product reached 495,608 ton/year (Nappu et al. 2010). The quality of nutrients contained in maize crop by product varies but

its nutrient is not sufficient to be used as a single feed. To be able to be used as feed optimally, this feed needs to be processed and should be supplemented with other feed ingredients to meet the nutritional requirements of cattle.

The purpose of the study was to improve the performance of Bali cattle cow fed on maize straw silage and supplemented with concentrate.

MATERIAL AND METHODS

Study was conducted in the farmer group Livestock Farms in Ma'tongeng Village District Mattiro Sompe Pinrang Regency in 2015. Maize by-products such as maize stalks, leaves and husks of maize were ensilaged. Silage maize-by products was made by chopping the maize by products into pieces with a size of about 5 cm, rice bran and molasses were added about 4% of forage, and then were mixed, put into drums/silo then sealed and kept for 21 days. The study used 20 Bali cattle cows at age approximately 2.5-3 years with an average body weight of 200 kg, and were divided into four treatments with five replicates, namely: (A) Maize straw silage 30% + elephant grass 60% + concentrate 10%; (B) Maize straw silage 50% + elephant grass 40% + concentrate 10%; (C) Maize straw silage 70% + elephant grass 20% + concentrate 10%; (D) Maize straw silage 100% + concentrate 10%. The feed was given to the cow for 120 days.

Table 1. Composition of the concentrate

Material	Composition (%)
Rice bran	54
Fist meal	25
Coconut cake	20
Salt	0.5
Mineral	0.5

The feeding was done for four months in which once a month the cow were weighed to observe the increase in body weight and to measure feed intake, feed offered, and refusal. Data were analyzed using a Completely Randomized Design (CRD) and continued with least significant difference, when there was a significantly difference. Parameters collected were body weight, body weight gain, feed consumption, and feed conversion.

RESULTS AND DISCUSSION

Feed nutrient

Result of the nutrients of maize silage and concentrate feed given to cows is shown in Table 2. Table 2 shows, the protein content of maize straw silage reached 9.30%, crude fiber content of 25.14% and fat 1.63%. Syamsu (2007) reported that the maize straw had average crude protein content was 6.38%, crude fiber 30.19% and crude fat 2.81%, BETN 51.69%, ash 8.94% and the content of total digestible nutrients 53.12%. Results showed addition of rice bran and molasses during silage treatment on maize straw increased crude protein content and decreased crude fiber and crude lipid. The quality of the maize straw as animal feed can be improved with ensiling technology, during process of ensiling carbohydrate was fermented by microorganisms under anaerobic conditions. In this process maize straw silage of low-quality feed source is converted into high-quality feed

for livestock as well as an energy source. In this study, pH of the silage was 3.9 which indicated of good silage.

Table 2. Feed nutrient cow Bali cattle in the Pinrang District

Material	Crude protein	Crude fiber	Crude fat
	----- % -----		
Maize straw silage	9.30	25.14	1.63
Elephant grass	9.82	27.74	2.75
Concentrate	18.00	8.48	0.57

Beef cattle production

Weight gain is an indicator to determine the growth rate of livestock, primarily for cattle fattening and feed efficiency. According to Huyen et al. (2011), in addition to breed, cow performance is also affected greatly by feeding management. Good quality feed offered in sufficient amounts will increase the productivity of livestock. The purpose of feeding maize silage with concentrate feed is to meet the nutritional needs of cattle.

Table 3. Average body weight and body weight gain of cows Bali cattle in Pinrang District

Parameter	Treatments			
	A	B	C	D
The initial body weight (kg/head)	148.83	178.33	150.00	173.25
Final body weight	176.67	216.33	188.33	209.50
Increase body weight (kg)	27.84	38.0	38.33	36.25
Body weight gain (kg/head/day)	0.23 ^a	0.32 ^b	0.32 ^b	0.30 ^b

Feeding maize straw silage and concentrate treatment could increase the body weight gain. Cows in treatment B, C, and D which were each given a 50, 70, and 100% of maize straw silage increased its body weight 0.30-0.32 ADG kg/head/day, while they are not significant different, and the lowest body weight was in treatment A 30% maize straw silage which was 0.23 kg/head/day. These results indicate that maize straw silage given at 50 to 100% provides a significant increase in body weight compared to that given at only 30%. It shows maize straw silage was able to meet the nutritional needs of cattle because it has a high protein content and good palatability.

Increased body weight of cattle cannot be separated from the provision of feed concentrate. Feed concentrates containing high protein ingredients such as fish meal and coconut meal which was preferred by cattle, so its could meet the nutrient need of cattle which is usually lacking in basal diet. According to Lamid et al. (2014) the function of high quality concentrate containing high protein and energy is to supplement the low quality forage. Concentrate feed can improve the digestibility of feed as a whole. The more concentrate is digested, meaning that the flow of feed in the digestive tract faster, resulting in increased rumen emptying and stimulate hunger of livestock, consequently allowing livestock to increase feed consumption.

The quality of feed for cows should be strictly controlled to maintain good body condition of the cow (medium size). Body weight gains in cows were ranging from 0.23 to 0.32 kg/head/day were sufficient for the cow. If the cow is too thin, it will produce a weak

calf due to lack of nutrition. While overweight cow, will have difficulty during calving (Fikar & Ruhyadi 2010).

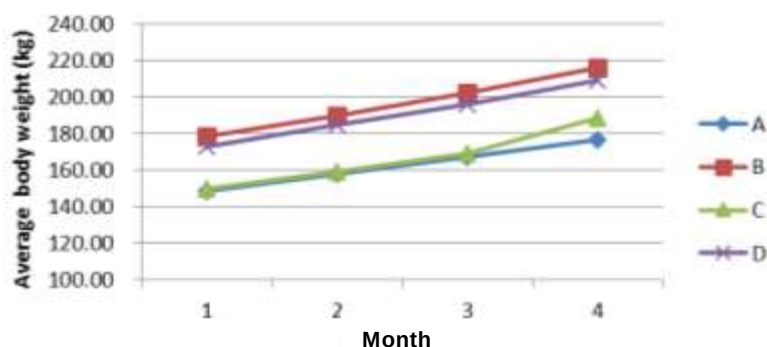


Figure 1. Graph of body weight on each period of weighing

The growth pattern during the study illustrated in Figure 1. The average body weight of all animals each month increased. The provision of additional maize silage and concentrate capable increased weight gain. Increase body weight in treatment B, C, and D by each silage maize 50, 70, and 100% was significantly than higher treatment A 30% silage.

Consumption is the amount of feed eaten by cattle that will be used to provide for basic living and production (Rosida 2006). Feed consumption is an essential factor to determine the basic needs and production. The consumption level can indicate feed palatability. Mariam (2004) reported that the amount of feed intake is an important determinant in determining the amount of nutrients obtained by cattle.

Table 4. Feed consumption and conversion for beef cattle

Componen	Treatments			
	A	B	C	D
Dry matter consumption (kg/head/day)				
Maize straw silage	1.17	2.84	3.65	5.51
Elephant grass	3.52	2.84	1.22	0
Concentrate	0.59	0.68	0.58	0.67
Total	5.28	6.36	5.45	6.18
Daily weight gain (kg/head/day)	0.23	0.32	0.32	0.30
Feed conversion	22.9	19.8	17.03	20.6

Table 4 shows that the average feed consumption of treatment B was the highest (6.36 kg/head/day), then those of treatments D, C, and A which were 0.67, 0.59, and 0.58 kg/head/day respectively. Tarigan (2010) reported that factors affecting the level of feed intake among others were: (1) Feed, including digestibility and palatability; and (2) Breed of livestock, age and health condition of livestock.

Feed conversion value more efficient when the amount of feed consumed less, but produces body weight gain higher or equal. Good quality feed will produce a higher of body weight. Lowest feed conversion value of the three treatments was achieved by treatment C at 17.03, then successively treatments B, D, and A with value of each 19.8, 20.6, and 22.9 respectively. The feed values of feed conversion treatment C lower

indicates the quality of the nutritional value of the feed is better than treatment B, D, and A.

The feed conversion value from this research was slightly higher than of Siregar (2008), which reported that good feed conversion of cattle in a range of 8.56 to 13.29. Feed conversion was influenced by the availability of nutrients in the diet and health of livestock. Cattle fed with treatment C was more efficient in the use of feed than cattle in treatment B, D, and A.

CONCLUSION

The conclusion from this study that feeding maize straw silage to the extent of 100% supplemented with concentrate feed as a protein source was able to improve the body weight of the beef cattle.

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