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Effect on growing of Bali cattle with difference age raised in cages

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Abstract :The purpose of this study was to obtain information on the influence of age differences on the growth of Bali cattle that are traditionally reared in cages. The number of cattle used were 9 heads. During the study, individual cages were used. This study had a randomized block design with three ranges of body weight as a group. The treatment in this study was the difference in the age of cattle, which consisted of cattle aged 1 year (I1), age 2 years (I2) and 3 years (I3). The results showed that the difference in the age of the cattle had no significant effect (P> 0.05) on the dry matter consumption of feed, daily body weight gain and the conversion of Bali cattle feed traditionally reared in pens. However, there is a tendency that cattle aged 1 year have better growth and efficiency in using feed than cattle aged 2 and 3 years. It can be concluded that raising cattle at 1 year of age results in more efficient growth than cattle at 2 and 3 years. However, further testing needs to be done with a higher number of cattle and a wider range of body weight.

Keywords: age, bali cattle, body weight, growth

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I. Introduction

Southeast Sulawesi, as one of the centers for livestock development in Eastern Indonesia, has natural resources that are potential enough for ruminants such as beef cattle because it has a large enough land area.Even so, beef cattle, especially Bali cattle, have not been better bred (intensively). In general, farmers raise cattle to use their energy to process agricultural land, take their manure as manure and for breeding Ananta [1], [2] and [3]. It is still very rare for farmers to position cattle as food-producing livestock (meat) which needs to be properly maintained through a touch of technology so that it can produce more and good quality meat and in turn will get revenue from the sale of cattle and / or more meat. maximum [4] ; [5].

Several studies with intensive rearing patterns show that Bali cattle raised using feedlot method can provide very high daily growth. For example, [6] obtained an average daily body weight gain of Bali cattle of 0.6 - 0.9 kg per head per day under feedlot maintenance conditions with quality feed. Whileresearch result by[7] showed that the body weight gain of Ongole breeds which were

given reinforcement feed had an average daily body weight gain of 0.780 kg. Even the daily body weight gain of Ongole crossbred cattle in this study was relatively better than the results of research by [8] of 0.73-0.82 kg / head / day.

This research was conducted as an effort to evaluate the growth of Bali cattle that are traditionally reared in cages, with an emphasis on age differences.

2. Materials and Methods

2.1. Materials

This research lasted for three months at Alebo Village Cattle Farm, Konda District, South Konawe Regency. The material of this study used 9 (nine) male Bali cattle which were grouped into three body weight ranges, I = 100 - 125 kg, II = 126 - 150 kg and III = 151 - 175 kg. The cattle used in this study belonged to the community. The cages used are individual cages, each equipped with a place to eat and drink. The equipment used is a digital scale either to weight cattle or cattle feed. The feed given consists of forage derived from field grass. Meanwhile, the tools and materials used in testing the dry content of the feed are ovens, porcelain plates and analytical scales.

Bali cattle are kept traditionally in cages with regular feeding and drinking water. In calculating feed consumption, before feeding the feed is weighed first and the next day the remaining feed is weighed.The amount of fresh forage given was 20 kg / head / day. Weighing the cow's body weight is carried out every 2 weeks to determine body weight gain.

2.2 Research Methods

The dry matter analysis of the feed was carried out by laboratory testing by taking 5 grams of feed samples into a porcelain dish and then drying it in an oven at 105 ºC for 5 hours. [9] stated the Dry Material Analysis equation as the following:

$$\mathbf{WC\% = 100\% - DM}$$

$$\mathbf{DM\ \% = \frac{DM\ total}{BS} x\ 100\%}$$

Note :

DM = Dry Matter

WC = Water content

DM Total = Weight After Drying

BS = Initial Sample Weight

The research design used was a randomizedblock design with a range of body weights as the basis for grouping, according to the instructions [10] . The intrinsic treatment applied is the age of the cattle which is determined based on the condition of permanent tooth replacement (incisors), namely: I1 = around 1 year old, I2 = around 2 years old, and I3 = around 3 years old. The number of groups or repetitions of each treatment was three times so that 9 experimental units were obtained.The statistical

model of the experimental design used is as follows :

$$Yij = \mu + Ki + Aj + \varepsilon ijk$$

i = 1,2,3j = 1,2,3

Note :

Yij = Observation Results

μ = General average of observations

Ki = The influence of Group i

Aj = The Effect of Age of the Crime Cow

εijk = Test error

As for the observed variables are as follows:

1. Consumption of dry feed ingredients, calculated based on the difference between the feed given each day and the rest of the next day. Consume materialsThis is then multiplied by the dry matter content of the feed.
2. Daily body weight gain, calculated based on the final body weight minus the initial body weight divided by the time interval.
3. Feed conversion, calculated based on the ratio between the amount of dry matter consumption of feed with weight gain.

3.Result and Discussion

Bali cattle growth can be described as the amount of feed consumption in the form of dry matter and body weight gain as well as feed conversion as a reflection of the efficiency of livestock in utilizing the consumed feed to gain body weight as the final product of the livestock raising process.

Feed consumption

The average dry matter consumption of Bali cattle feed based on different ages during the study is presented in “Table 1” below:

Table 1. The Average Consumption of Bali Cattle Feed Dry Matter Based on Different Ages During the Study (kg / head / day)

Group (Based on Body Weight range)	Age of Cattle Based on Change of Teeth (Incisors)		
	I1	I2	I3
I. (100 - 125 kg)	3.18	3.53	3.62
II. (126 - 150 kg)	3.25	3.11	3.13
III. (151 - 175 kg)	3.56	4.33	4.62
Average	3.33	3.66	3.79

Note: different superscripts in the same column show not significant differences (P > 0.05)

The results of statistical analysis showed that the difference in the age of the cattle had no significant effect (P>0.05) on the dry matter consumption of Bali cattle feed during the study. The results showed that the dry matter consumption of feed was relatively uniform even at different ages. However, there was a tendency that the increasing the age of the cattle (or getting older), the average consumption tends to increase too, although at an unreal level.

This was probably due to the fact that the cattle used in the study have a different range of body weight according to the age of the cattle. Physiologically, cattle with heavier body weight require relatively more feed than cattle with low body weight. [11] : [12]show a strong correlation between cattle body weight and feed intake (consumption). According to the [13] the important factors that determine the amount of feed intake are the age of the cattle, the range of body weight, sex and conditions of maintenance whether the cow is pregnant or breastfeeding, the cow is growing or sexually mature.

According to physiological weight (body weight) plays a more important role in determining growth performance than chronological age (length of life) [14];[15], so that cattle that are kept with a body weight range of no more than 10% will not show ration consumption real different.

The consumption of dry matter for Bali cattle obtained in this study (3.33 - 3.79 kg / head / day) is the same as [16] and [17] who get dry matter consumption of cattle fed with field grass regularly. adlibitum, reinforcing feed 1.8% from BW + field grass adlibitum and reinforcing feed 1.8% from BW + field grass adlibitum + ammoniated rice straw respectively 3.45, 3.90 and 4.32 kg / head / day.

Under normal conditions the consumption of dry matter for feed should be around 2.5% of body weight, so that a cow with a body weight of 200 kg will consume 5 kg of dry matter per day [12] ; [13] ; [15].

Increase in Body Weight

The average body weight gain of Bali cattle based on different ages during the study is presented in "Table 2" below :

Table 2. The Average Weight Gain of Bali Cattle Based on different ages during the study (kg / head / day)

Group (Based on Body Weight range)	Age of Cattle Based on Change of Teeth (Incisors)		
	I1	I2	I3
I. (100 - 125 kg)	0.19	0.11	0.13
II. (126 - 150 kg)	0.19	0.18	0.09
III. (151 - 175 kg)	0.30	0.17	0.14
Average	0.23	0.15	0.12

Note: different superscripts in the same column show not significant differences (P> 0.05)

The results of statistical analysis showed that the difference in the age of the cattle had no significant effect (P>0.05) on the daily weight gain of Bali cattle during the study. This shows that the average body weight gain of Bali cattle was relatively uniform, between 0.12 and 0.23 kg per head per day. Besides, the average increase in cattle from the results of this study was relatively low as a further result of the low consumption of dry feed ingredients. Besides that, the traditional maintenance conditions with the majority of providing feed in the form of field grass are thought to be the trigger for the low body weight gain of cattle. Because field grass has a very high fiber content, especially wood content (lignin) compared to cellulose and hemicellulose.

According to [18] and [19] the amount of feed consumption will greatly determine livestock growth. If the amount of food consumed is high, the growth will be fast and will also reach a high body weight.

The growth pattern of this study is in line with the results of research by [20] which measured the weight gain of Bali cattle in three age groups during the rainy season, namely: 0.46 kg / head / day for calves, 0.51 kg / head / day for young cattle. 1 - 2 years old and 0.43 kg / head / day for adult cattle over 3 years old.

According to [21], the postnatal growth rate (after birth) follows the sigmoid growth pattern (as shown in Figure 1), where growth is at first a little slow, then very fast, and then gradually begins to decrease or slow down. The period of very fast growth in cattle, is in the range of the age of the cattle about 1 year at the same time as sexual maturity [22].

Feed Conversion

Feed conversion is the amount of feed consumed to form one kilogram of body weight. The average feed conversion of Bali cattle based on different ages during the study is presented in "Table 3" below :

Table 3. Average Bali Cattle Feed Conversion Based on different ages during the study

Group (Based on Body Weight range)	Age of Cattle Based on Change of Teeth (Incisors)		
	I1	I2	I3
I. (100 - 125 kg)	16.11	33.69	29.60
II. (126 - 150 kg)	20.00	16.86	35.08
III. (151 - 175 kg)	11.94	25.14	33.53
Average	16.02	25.69	32.21

Note : different superscripts in the same column show not significant differences (P> 0.05)

The results of statistical analysis showed that the difference in the age of cattle had no significant effect (P>0.05) on feed conversion during the study. However, the average feed conversion tends to increase with increasing age of the cattle. This means that young cattle (1 year) are more efficient in using feed than older cattle (2 and 3 years). The feed conversion obtained in this study is in line with the feed conversion in [16] who gave Bali cattle three kinds of rations, namely: field grass adlibitum, reinforcing feed 1.8% from BW + field grass by adlibitum and reinforcing feed 1.8% from BW + field grass adlibitum + ammoniated rice straw with the results of feed conversion 27.00, 12.89 and10.21 respectively.

The high conversion of feed for cattle in this study was the impact of low feed consumption and the resulting weight gain of cattle. The high feed conversion is thought to be due to the low consumption of dry feed ingredients. It is suspected that the forage crude fiber content during the study was quite high because when the research was carried out, Konawe Regency was hit by a drought (dry season) so that it was thought to affect the quality of forage forage, especially the high and coarse and low protein and BETN. According to 9[18] and [13] high levels of crude fiber will reduce palatability and feed consumption which will have an impact on the inefficiency of cattle in consuming feed ingredients.

4.Conclusion

The difference in the age of the cattle did not significantly (P> 0.05) affect the dry matter consumption of feed, daily body weight gain and feed conversion of Bali cattle that are traditionally reared in pens. However, there is a tendency that cattle aged 1 year have better growth and efficiency in using feed than cattle aged 2 and 3 years.

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