Response of Brahman crossbred cows and their calves kept under semi-intensive and fed them on local-fodder supplement in East Sumba Regency, East Nusa Tenggara Province

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ABSTRACT: An experiment was carried out in the Regency of East Sumba, Province of East Nusa Tenggara using fourteen late pregnant cows (7 – 9 months pregnancy) and their calves of 0 – 10 months old. The aims of this study were to improve productivity of Brahman crossbred cows and to reduce mortality rates of their calves by feeding them on local-fodder based supplement. Cows and calves were distributed into two treatments allotting randomized block design. Treatments on pregnant and lactating cows consisted of 6 to 7 heads as replication, while on calves consisted of 5 to 7 heads as replication. They were distributed into five groups and two dietary treatments: (a) late pregnant cows in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg day^{-1} before grazed; the variables observed were live weight gain and body linear gain of their new-born calves; (b) lactating cows in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg day^{-1} before grazed; the variables observed were milk suckled by calves, live weight gain of both groups after 2 months of lactation; (c) 1 – 2 months old of suckling calves in group A grazed during the day with their mother and received no additional supplement, whereas those of group B grazed during the day with their mother and received an additional liquid supplement of 1 kg day^{-1} before grazed; the variables observed were live weight gain, linear body gain and mortality rate; (d) pre-weaning calves grazed during the day and received no additional solid supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg day^{-1} before grazed; (e) weaning calves of more than 6 – 10 months old in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional supplement of 1 kg day^{-1} before grazed. The variables observed for the last three groups were live weight gain, and linear body gain. Mortality was observed during the course. Data were statistically analyzed using SAS packaged program for T-test. The results showed that the effect of treatments on variables measured were: (a) late pregnant cows were highly significant ($P<0.01$) affected both born weight and body linear of calf; (b) lactating cows were highly significant ($P<0.01$) affected live weight gain two months postpartum; (c) calves of 1 – 2 months old were highly significant ($P<0.01$) affected both daily live weight gain and body linear gain; (d) calves of 3 – 6 months old were highly significant ($P<0.01$) in both daily live weight gain and body linear gain; (e) calves of more than 6–10 months old were highly significant ($P<0.01$) in both daily live weight gain and body linear gain. No calves mortality was found during the experiment. It is concluded that the use of local-fodder based supplement on late pregnant cows and new born up to weaning calves able to improve their performance.

Key words: Brahman Crossbred cows, calves, supplement

INTRODUCTION

Indonesia is an example of a country in South-East Asia where for centuries, beef cattle systems have developed in harmony with local conditions of climate, vegetation, existing farming systems and consumer preferences. Cattle play important role in many aspects of farmer's life in Indonesia; they

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produce dung to fertilize the land, utilize agricultural by-products, act as live savings in case of the farmer's urgent cash weeds, produce meat, and the special advantage of cattle compared to other animal is their ability as draught power to plough land under mixed farming systems (Widi *et al*., 2006). East Nusa Tenggara is a province in Indonesia which has long been known as an area of producing cattle, mainly Sumba Ongole and Bali cattle (Sobang, 2005). Without doubt, the high population increase in Indonesia is a major driving force to increase on the demand of animal products including beef meat. This demand can not be supplied only by local breed such as Sumba Ongole, Bali cattle, Madura cattle and Javanese cattle, due to the fact that they have a relatively low productivity. In order to fulfill meat demand and improve productivity of these local breeds, Indonesian government have implemented the either artificial insemination program using exotic breed or imported live animals semen which are believed to have a better productivity (Widi *et al*., 2006).

Cross-breeding has become a standard approach to increase livestock productivity in many developing countries. It has the objective to obtain desirable characteristics and to exploit hybrid vigour or heterosis. Under good management conditions, cross-bred could result in increased gain and productivity. The results from cross-breeding programs vary from one country or region to another, because of genotype and environment interactions (Sutresniwati *et al*., 2006). Nowadays, there are a lot of cattle breed are existing in Indonesia as a result of the cross-breeding policy from the Indonesian government. According to Sobang (2005), Brahman cross-breed from Australia has been introduced and distributed to islands of Sumba and Timor in 2003 and 2004 respectively. This is the second introduction of this imported cattle breed to these islands after failure in 1970s. This study is aimed to improve productivity of Brahman cross-bred cows and to reduce mortality rates of their calves by feeding them on local-fodder based supplement.

MATERIALS AND METHODS

Fourteen late pregnant cows (7 – 9 months of pregnancy) and calves (0 – 10 months old) were used in this trial for six months. They were let to grazed on the available native pasture of approximately 550 ha at Matawai Maringgu Breeding Center owned by local government of the Regency of East Sumba, Province of East Nusa Tenggara. Cows were distributed into two treatments following Randomized Block design. Each treatment on pregnant and lactating cows consisted of 6 to 7 heads as replication, while on calves consisted of 5 to 7 heads as replication. Supplement either liquid or solid (Table 1) were formulated to meet National Research Council (NRC, 1984) requirements for cows.

Table 1. Nutrient composition of supplement either liquid or solid.

	Type of supplement	
Nutrient	Liquid, %	Solid, %
Dry matter	81.20	91.10
Crude protein	25.60	23.42
Crude Fat	3.70	4.30
Crude fiber	3.46	10.60
NFE	64.22	61.42
Ash	6.65	6.21
Ca	0.21	0.19
P	0.67	0.64
ME, cal./g	4.336	4.245

Cows were fed in two treatments of: (a) late pregnant cows in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg/day before grazed; the variables observed were newborn weight and linear body gain of calves after 12 hour born; (b) lactating cows in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg/day before grazed; the variable observed was live weight gain of cow 2 months postpartum; (c) 1 – 2 months old of suckling calves in group A grazed during the

day with their mother and received no additional supplement, whereas those of group B grazed during the day and received an additional liquid supplement of 1 kg/day before grazed; the variables observed were daily live weight gain and linear body of calves; (d) pre-weaning calves of group A grazed during the day and received no additional solid supplement, whereas those of group B grazed during the day and received an additional solid supplement of 1 kg/day before; the variable observed were live weight gain and linear body of calves and their mortality; (e) weaning calves of more than 6 – 10 months old in group A grazed during the day and received no additional supplement, whereas those of group B grazed during the day and received an additional supplement of 1 kg/day before grazed; the variable observed were live weight gain and linear body of calves and their mortality. Data were statistically analyzed using SAS packaged program for T-test (SAS Institute, 1989).

RESULTS AND DISCUSSION

The statistical analysis of the results of the experiment presented in the Table 2 showed that the effect of treatments on variables measured were: (a) late pregnant cows were highly significant ($P<0.01$) affected both born weight and body linear size of calf; (b) lactating cows were highly significant ($P<0.01$) affected live weight gain two months postpartum; (c) calves of 1 – 2 months old were highly significant ($P<0.01$) affected both daily live weight gain and body linear size; (d) calves of 3 – 6 months old were highly significant ($P<0.01$) in both live weight gain and body linear size; (e) calves of more than 6–10 months old were highly significant ($P<0.01$) in both live weight gain and body linear size. No calves mortality was found during the experiment.

It can be seen from the Table 2 that late pregnant cows fed on supplement was perform better in terms of her newborn calves bodyweight and their body linear gain than of late pregnant cows without supplemented.

Table 2. Mean of variables measured during the experiment

Variables measured	T1	T2
Late pregnant cows		
- newborn weight, kg	18.67[a]	22.58[b]
-body linear size :		
. body length, cm	53.50[a]	58.17[b]
. shoulder height, cm	66.83[a]	72.50[b]
. girth circle, cm	60.42[a]	63.58[b]
Lactating cows		
- Liveweight gain 2 months postpartum, kg	-0.11[a]	0.09[b]
Calves of 1 – 2 months old		
daily liveweight gain, kg	0.03[a]	0.17[b]
body linear size :		
. body length, cm	0.03[a]	0.08[b]
. shoulder height, cm	0.034[a]	0.08[b]
. girth circle, cm	0.04[a]	0.10[b]
Calves of 3 – 6 months old		
- daily liveweight gain, kg	0.08[a]	0.22[b]
-body linear size :		
. body length, cm	0.02[a]	0.05[b]
. shoulder height, cm	0.02[a]	0.07[b]
. girth circle, cm	0.02[a]	0.08[b]
Calves of 6 – 10 months old		
daily liveweight gain, kg	0.08[a]	0.25[b]
body linear gain :		
. body length, cm	0.05[a]	0.09[b]
. shoulder height, cm	0.025[a]	0.06[b]
. girth circle, cm	0.013[a]	0.09[b]

[a,b] Different superscript within rows shows differences between treatments ($P<0.01$).

This indicated that supplement provides better nutrients to meet the late pregnant cows requirement and in turn meet the newborn calves nutrients requirement by suckling their mother. Meanwhile, the live weight gain of lactating cows two months postpartum fed on supplement was better than of without being supplemented. Likewise, for the calves of 1 – 2, 3 - 6, and more than six months old fed on either liquid or solid supplement showed that both their daily live weight gain and body linear gain was better than without supplemented one. This study confirmed previously reported findings that preformed protein supplements increased performance of ruminants fed straw-based diets compared with non-supplemented or non-protein supplemented diets (Church and Santos, 1981; Males *et al*., 1982; Nelson *et al*., 1985).

CONCLUSIONS

From the results obtained during the of feeding trial, it can be concluded that the use of local-fodder based supplement on late pregnant cows and new born up to weaning calves able to improve their performance.

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