Body Weight Gain Response of Sumba Ongole Cattle to the Improvement of Feed Quality in East Sumba District, East Nusa Tenggara, Indonesia

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ABSTRACT: The main hindrance of cattle feeding in East Nusa Tenggara is the low quality of feed during the long dry season (8-9 months/year) which brought about a low yearly average DWG to the animals. An initial experiment to compare cattle on native grasses and cattle on mainly *Leucaena leucocephala* leaf was conducted in East Sumba District to demonstrate the importance of improving the quality of feed to the farmers, who for long time have been much relied on native grasses as feed sources. Sumba Ongole Cattle (5-9 heads) with average body weight of 200 kg at two villages i.e. Padadita and Wanga. Five to nine cattle were fed on regular feed of mainly native grasses at Padadita and mainly *L. Leucocephala* leaf at Wanga. The experiment was conducted during the dry period in 2014 (June to October). Feed was given *ad-libitum* during the experiment. The results showed significantly higher body weight gain in cattle received leucaena leaf compared with cattle that received native grasses, which lost weight during the experiment. The experiment therefore concluded that it is important to improve the quality of feed in cattle feeding in East Sumba, which could be done trough the development and use of *L. leucocephala* to establish high quality feed resources in the island, where now it can be considered rare.

Key words: East Nusa Tenggara, East Sumba, Sumba Ongole, Leucaena leucocephala, dry season feeding.

INTRODUCTION

The main important hindrance to cattle productivity improvement in Nusa Tenggara Timur is the provision of sufficient feed in quantity and quality, especially during the dry period (Nulik dan Bamualim, 1989), at what time cattle (the free grazing animals) experiencing body weight lost, high calf mortality, as well as long calving interval brought about by the lack of feed availability in the native grasslands.

With its long dry season characters (8-9 months), every year the classic problem of feed shortage during the dry season would always occur again and again with no proper solution with various reasons. The problem of feed shortage in Sumba is obvious from the performances of cattle during the dry season when most of the native grasses have decreased in quality and forage production. During the dry season cattle performances are poor with apparent very low body condition score (Picture 1). The main reasons are: (i) farmer are not used to establishing high quality fodder plant able to produce in all the year (especially to the peak of dry season), (ii) high reliability to the availability of native grazing lands which thus hindered the efforts to develop forage plantings (Kana Hau, *et al*., 2014), (iii) in general farmers in Sumba believe that SO cattle does not eat leucaena, (iv) general observation in the field too indicated that SO cattle refuse to eat leucaena.

In the beginning, before the experiment, the fact that SO cattle refuse to eat leucaena was suspected relating to the mimosine content in the leucaena forage which may have caused bad experience to the SO cattle. The cause may have caused the animal to experience toxicity (indicating by over salivation, dizziness, lost of hairs especially in the tail and body parts, followed

by bad growth of the animal and animal lost weight) and therefore animal refused to eat the forage even though it is available abundantly during the dry season. This can be observed in the field during the dry season when the group of cattle herd passed by the reachable leucaena swards and prefer to eat the low quality standing hay to the fresh and abundant leucaena. In contrast to the suspicion, the initial investigation in East Sumba to explore the existence of *Sinergistes jonesii* it was found that the bacteria is consistently present in sufficient amount in several types of animals (cattle, buffaloes, and goats) in Waingapu, Wanga, Melolo, and Kakaha sites detected in urine and rumen fluid (Halliday *et al*., 2014). Therefore it was concluded that there should be no reason for SO cattle not to eat leucaena.

Depart from the findings and problems an experiment on leucaena feeding has been conducted in East Sumba during the dry season in the year of 2014, under farm condition and feeding practices.

MATERIAL AND METHODS

Two locations have been selected purposely for the experiment, these consisted of: (i) Padadita village in Pandawai Sub-District where the main feed for the cattle consisted of native grasses and other agriculture byproduct such as maize stover, and (ii) Wanga village where the main ration consisted of leucaena (*Leucaena leucocephala*).

In each village 5 – 9 heads of SO Bull with average weight of 200 kg were used. During the experiment, all bulls were weighed regularly every month, for 6 months during dry season (June to October 2014). Data were then calculated for daily weight gain (DWG) and the cumulative body weight.

Feed was provided and given by the farmers according to the needs of the animals at the initial weighing (about 3% DM of body weight) and were adjusted each month according to the weight of the animals. In general, farmers provide ad-libitum feed for the animals, as it was also difficult in the farmer level to exercise a controlled experiment. Thus farmers were allowed to feed the animals according to their daily practices. As this is an on farm experiment, only body weight gain data that were collected plus visual observations on the acceptance of the animals on the leucaena fodder as well as their adjustment to the diet. And thus only simple statistic was performed, i.e. total and average values, followed by plotting the monthly weight data into graph to understand the trend of the body weight changes during the dry season (June to November) on cattle have improved feed (mainly leucaena) and cattle under normal practices (eat mainly native grasses). An independent T-test was performed on the data of daily weight change (kg/head/day) accordingly.

RESULTS AND DISCUSSION

The initial average body weight of the animals at Padadita was 222 kg (8 SO Bulls), while average initial body weight of the animals at Wanga was 208 kg (5 SO Bulls). From the regular monthly body weight measurement it was discovered that Bulls at Padadita every month continued on losing weight to the end of dry season (November). In contrast, SO Cattle at Wanga (where cattle was just trained to eat leucaena prior to the experiment), though still low, consistently experienced body weight gain in each month of weighing (Graph 1), as the data indicated significant differences by independent T-tests in the period of July-August, August-September, and September October (Graph 2).

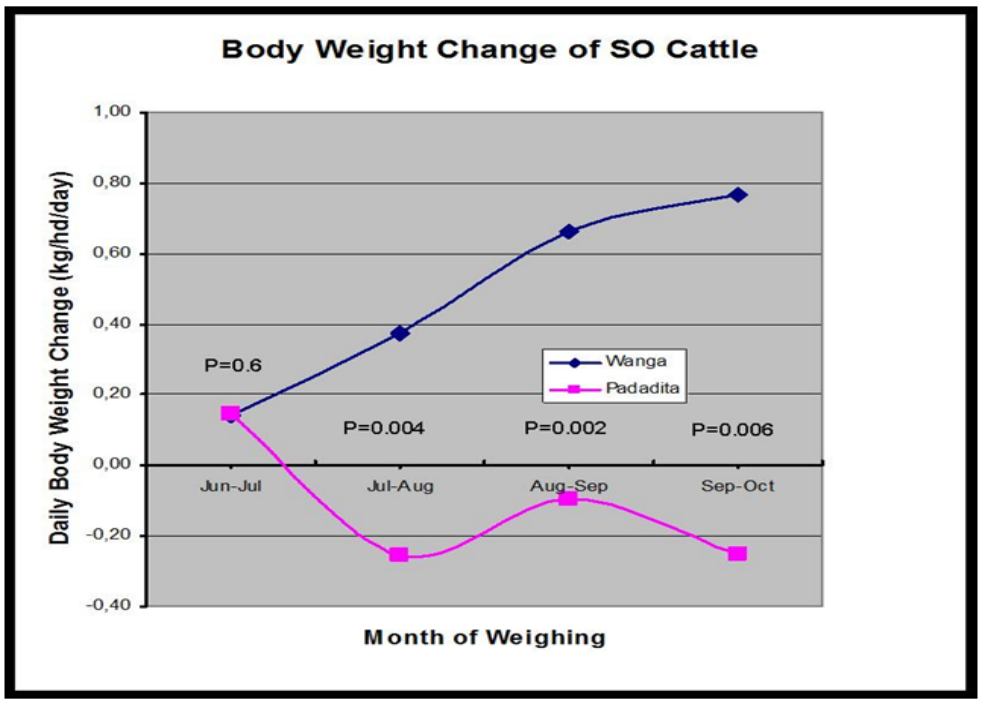
From the graph it can be seen that at Padadita village where SO Cattle have dry native grass as their main ration constantly experienced body weight loss to the end of the dry season (October), similar to the general condition of free grazing animals in the native grasslands. It can also be seen

that weight gain on the first month when SO cattle were being trained to eat leucaena was small, this is in relation to the period for the animals to adapt to the new forage, thus no significant difference was obtained (P=0.6). At this stage animals appeared in not proper condition with obvious notable over-salivation, and a little bit loosing hairs, mostly on the tail. This condition only appeared in the first and half period of the second month and then the animals started to regain, and so have better weight gain. This is in accordance with the findings from other authors, that in this period usually the mimosine degradable bacteria Sinergistes jonesii still increasing in their population in the rumen according to the increase consumption or intake of leucaena fodder, as the bacteria needs mimosine as their food requirement (McSweeney, 2014; Halliday *et al.,* 2014).

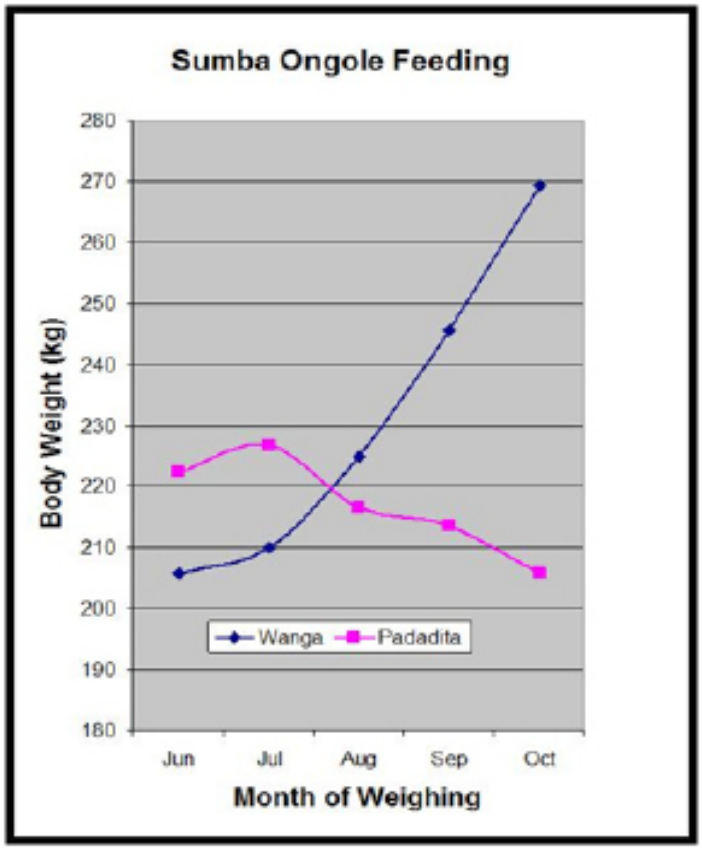
The simple experiment has demonstrated that there is a great potential for expanding the practice of leucaena feeding, by establishing more leucaena fodder trees in Sumba Island, especially in East Sumba, where most of SO cattle population is concentrated in the island (60%) (Nulik *et al.,* 2013). As currently a new variety of *L. leucocephala cv. Tarramba*, tolerant to psyllid attack, is being promoted in Eastern Indonesia (Nulik *et al.*, 2013).

CONCLUSION

Leucaena leucocephala forage has the potential to be constantly developed and increased in their usage as high quality feed for SO cattle fattening in Sumba, which are in general always experiencing body weight loss during the dry season, when most of the native grasses have hayed off in the native grasslands. The recommendation to enhance the development of *Leucaena leucocephala* cultivation in the island of Sumba is encouraged by the findings that the bacteria Sinergistes jonenesii as the main bacteria to degrade mimosine and its derivatives (3,4 DHP and 2,3 DHP) is consistently detected in the rumen of all ruminants (cattle, buffalo and goats) with ration contained 30-40% leucaena, a condition hardly found consistently in Timor Bali cattle (domesticated of wild Banteng) (Hallyday *et al.*, 2014).



Graph 1. Response of cumulative body weight changes in SO cattle in East Sumba fed on *Leucaena leucocephala* as the main ration compared with that of native grasses only.



Graph 2. Response of daily body weight changes in SO cattle fed on *Leucaena leucocephala* as the main ration at Wanga Village compared with that of native grasses only at Padadita Village in East Sumba.

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