Growth of Bali Bulls Fattened with Forage Tree Legumes in Eastern Indonesia: Leucaena leucocephala in Sumbawa

Tanda Panjaitan  
*Assessment Institute for Agricultural Technology, Indonesia*

Muhammad Fauzan  
*Assessment Institute for Agricultural Technology, Indonesia*

H. Dahlanuddin  
*University of Mataram, Indonesia*

Michael J. Halliday  
*The University of Queensland, Australia*

H. Max Shelton  
*The University of Queensland, Australia*

Follow this and additional works at: [https://uknowledge.uky.edu/igc](https://uknowledge.uky.edu/igc)

Part of the Plant Sciences Commons, and the Soil Science Commons

This document is available at [https://uknowledge.uky.edu/igc/22/1-8/29](https://uknowledge.uky.edu/igc/22/1-8/29)

The XXII International Grassland Congress (Revitalising Grasslands to Sustain Our Communities) took place in Sydney, Australia from September 15 through September 19, 2013. Proceedings Editors: David L. Michalk, Geoffrey D. Millar, Warwick B. Badgery, and Kim M. Broadfoot

Publisher: New South Wales Department of Primary Industry, Kite St., Orange New South Wales, Australia
Growth of Bali bulls fattened with forage tree legumes in Eastern Indonesia: *Leucaena leucocephala* in Sumbawa

Tanda Panjaitan\(^A\), Muhammad Fauzan\(^A\), Dahlanuddin\(^B\), Michael J Halliday\(^C\) and H Max Shelton\(^C\)

\(^A\) Assessment Institute for Agricultural Technology: NTB, Mataram, Lombok, NTB 83371, Indonesia
\(^B\) Faculty of Animal Science, The University of Mataram, Lombok, NTB 83125, Indonesia
\(^C\) School of Agriculture and Food Sciences, The University of Queensland, St Lucia 4072, Australia

Contact email: tanda_panjaitan@yahoo.com

Keywords: *Leucaena leucocephala*, *Boss javanicus*, Sumbawa, growth rates.

**Introduction**

The contribution of West Nusa Tenggara Province to domestic beef supply in Indonesia is relatively small, however, beef cattle are very important for the livelihoods of smallholder farmers in the region.

Bali cattle (*Boss javanicus*) are the predominant breed as they are adapted to harsh nutritional conditions, are highly fertile and have low calf mortality (Toelihere 2003). While genetically capable of achieving a growth rate of 0.85 kg/d (Mastika 2003), Panjaitan (2012) identified poor nutrition as a severe limitation to animal growth in traditional village systems. Improving feed quality and supply is vital to increasing growth rates and product quality. Forage tree legumes such as leucaena (*Leucaena leucocephala*) offer the best chance of providing high quality feed to fatten Bali bulls in village systems where leucaena is well-adapted. Indeed, the feeding of leucaena has been practiced for about two decades in Sumbawa district of West Nusa Tenggara although the practice is limited to specific villages, mostly Balinese, even though farmers nearby have similar biophysical conditions and nutritional problems.

The objective of this work was to characterize the best practices employed by farmers in Sumbawa that maximize growth rates by feeding leucaena so that their detailed knowledge can be passed onto other villagers in a pilot roll-out program (Kana Hau 2013).

**Materials and Methods**

The study was conducted from April 2012 to March 2013 in the hamlet of Jatisari in Sumbawa district, which has an annual rainfall of 865 ± 246 mm/year mostly falling between November and May. Bull fattening in Jatisari is based on feeding high leucaena diets in a cut-and carry system to animals tethered in simple sheds (roof, cement floor, feed bunker but no side walls). Farmers' normal management and trading practices resulted in constantly changing numbers of bulls being fattened. Parameters monitored included average daily gain (ADG), feed offered including amount of leucaena in diet and sale weight. All cattle were weighed each month following an overnight curfew on feed and water. Fresh feed offered was determined over 3 consecutive days each month. Bulls were treated with albendazole to control internal parasites prior to being fattened. Deltamethrin was sprayed regularly to control external parasites.

**Results and Discussion**

In general, farmers had three fattening periods each year. The average fattening period was 127 ± 58 days; the shortest and the longest fattening periods were 37 and 296 days, respectively. The number of bulls purchased and fattened during the wet season was more than twice that of the dry months due to increased feed resources available. The initial weight of bulls varied within and between farmers with an average of 191 ± 41 kg at 18 ± 7 months of age; the lightest and heaviest initial weights were 97 and 277 kg, respectively. Farmers with younger cattle had a longer fattening period. The average sale weight of bulls was 229 ± 27 kg while the lowest and the highest were 188 and 318 kg, respectively. Average sale weight was thus below the accepted standard for slaughtering beef (300 kg). This low sale weight may contribute to the low dressing percentage commonly stated by traders and butchers in the region.

There was no overall pattern of animal sales which was generally based on the need for money, rather than on optimal bull parameters. Increasing sale weight by delaying sale time and extending the fattening period may be an option to not only increase dressing percentage but also obtain premium prices. The ADG over the 11 months was 0.42 ± 0.12 kg/d. The highest average point of 0.61 kg/d was obtained early in the dry season in June while the lowest average point of 0.23 kg/d occurred at the end of the dry season in October (Table 1). However, bulls belonging to the best farmers achieved ADGs of 0.83 kg/d over the 11 month period including ADGs of ≥1 kg/d for May, June and August. As most bulls were under-nourished on arrival, the highest ADGs were achieved in the initial month due to compensatory weight gain. It was not possible to determine the precise amount of feed consumed as dry
Table 1. The average daily gain of 276 Bali bulls fattened on leucaena under a smallholder cut-and-carry system between May 2012 and March 2013 in Sumbawa, Indonesia. (Values listed are cumulative, with the monthly period ending as listed).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average daily gain (kg/d) (±SE)</td>
<td>0.56 ±0.09</td>
<td>0.61 ±0.05</td>
<td>0.47 ±0.03</td>
<td>0.40 ±0.06</td>
<td>0.37 ±0.04</td>
<td>0.23 ±0.05</td>
<td>0.25 ±0.02</td>
<td>0.38 ±0.02</td>
<td>0.56 ±0.03</td>
<td>0.41 ±0.03</td>
<td>0.42 ±0.03</td>
</tr>
<tr>
<td>No of bulls</td>
<td>49</td>
<td>55</td>
<td>59</td>
<td>54</td>
<td>55</td>
<td>55</td>
<td>95</td>
<td>134</td>
<td>68</td>
<td>130</td>
<td>136</td>
</tr>
<tr>
<td>Average weight bull purchased (kg)</td>
<td>145</td>
<td>186</td>
<td>182</td>
<td>136</td>
<td>186</td>
<td>156</td>
<td>137</td>
<td>141</td>
<td>128</td>
<td>118</td>
<td>150</td>
</tr>
<tr>
<td>Average weight bull sold (kg)</td>
<td>188</td>
<td>237</td>
<td>158</td>
<td>220</td>
<td>242</td>
<td>216</td>
<td>214</td>
<td>184</td>
<td>198</td>
<td>176</td>
<td>206</td>
</tr>
<tr>
<td>Average weight gain of best herd (kg/d)</td>
<td>1.4</td>
<td>1.0</td>
<td>0.8</td>
<td>1.1</td>
<td>0.7</td>
<td>0.7</td>
<td>0.5</td>
<td>0.8</td>
<td>0.6</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>No bulls in best</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Acknowledgements

The Australian Centre for International Agricultural Research funded this study as project LPS/2008/054.

References


