

Beef Cattle Production System, Constraints and Opportunities for Small Farmers in South Central Timor Regency, West Timor

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Abstract

Bali cattle is important in South Central Timor Regency, counted for 21.55% of 778.663 heads of cattle in East Nusa Tenggara province. This study was aimed at evaluating the potency, constraints and opportunities of beef cattle to small farmers. Two hundreds thirty two respondents were interviewed, site observation was made on the cattle farming. The results showed that the average number of cattle ownership was 9 AU/farmer. The majority (94.83%) of the farmers on productive age (44 years old) with low education and 17 years farming experience. The main objectives of raising cattle was for breeding (68.53%), fattening (14.22%) and the combination. Animals were commonly kept off shelter; 60.25% of farmers grazed during the day and tethered at night. Natural matings was common, cattle were fed with forages comprises grass and legumes. Additional feed and mineral were given as necessarily. Reproductive characteristics was considerably high, indicated by the ratio of males and females of 1:2.57, high birth rate of 79.69%, and highly adapted of animal to the feed scarcity and harsh environment. The main constraints were the unavailability of feed and sufficient water during dry seasons, high mortality rate of young animal 19.34% due to diseases caused by malnutrition, lack of animal health and disease control as well knowledge and skill of village farmers. Bali cattle has potential to be developed in South Central Timor through the provision of sufficient feed with balance nutrients during dry season, health and disease control by livestock services, and training the farmers on cattle management

Keywords: cattle, production, small farmers, South Central Timor

Introduction

South Central Timor (TTS) is aregencyin the province of East Nusa Tenggara (NTT). Geographically it was located in the southern part of Timor Island with elevation varying from the lowest 44 meters above sea level in Boking districttothe highest1, 480 meters above sea level in Fatumnasi district. TTS regency is characterized as a dry tropical climate with only two seasons, dry and rainy, with an average rainfall in 2012 of 1,054.81 mm/year (BPS Kabupaten TTS, 2014).

Raising beef cattle is part of farmers activity in TTS, a tradition that must be preserved from generation to generation (Ratnawaty and Budianto, 2011). Yusuf and Nulik (2008) reported that beef cattle in this region had a number of roles, namely as: (1) a source of family income, (2) labor replacement, (3) a symbol of social status of family members, (4) a source of fertilizer for plants, and (5) a source of protein for the community. Based on the agriculture census, in 2011 TTS was a center for beef cattle development, with a population of 167.834 heads(21.55%) of the cattle population in NTT province (BPS, 2011). Beef cattle contributed up to19.8% to the total GDP of TTS which reached 2.88 trillion rupiah (approximately 215.5 million USD) in the year 2012. This indicates that TTS has good prospect for beef cattle development. The study aimed to evaluate the potency, constraints and opportunities for improving beef cattle production, for small holding farmers well being.

Results and Discussion

Characteristics of Farmers

Men were dominantly responsible for beef cattle farming activity compared to women (94.83%: 5.17%). According to Amalo *et al.* (2012), effective time spent daily for cattle raising activities was 5 hr/d, 6 d a week, making more females preferred to act as supporting labor in such family business. The farmers were categorized in their productive ages averaging 44 years, and farming activities had been introduced to

their children since younger ages 20 year old. A few farmers aged 72 years old still raised cattle, reflecting that beef cattle farming had been carried out from generation to generation. Farmers had averagely 17 years experience in cattle farming. Most of them had low level of formal education background, approximately 61.64% were elementary graduates. BPS data for TTS District showed that TTS community spent only 6.6-6.7 years in formal education during the period 2011-2013 (BPS Kabupaten TTS, 2014). According to Soeprana(2005) and Siswoyo et al. (2013), low education level of farmers could affect their access to information and appropriate management and technology in cattle husbandry, feed and reproduction, and other production input related to institutional roles and development.

Although activities in beef cattle production could improve economic status of farmers, their involvement in farmers groups/institutions was low (39.22%). Despite its importance to strengthening farmers capacity, and bargaining positions. Siswoyo *et al.* (2013), stated that farmers groups was essential in increasing cash income of group members, hence, family welfare.

Table 1. Characteristics of beef cattle farmers in South Central Timor Regency

No.	Variables	Results
1.	Involment cattle farming activity (%)	
	a. Men	94.83
	b. Women	5.17
2.	Age (years)	43.96±11.1
3	farmers' education (%)	
	Elementary School	61.64
	Yunior High Shool	19.83
	Senior High Shool	15.95
	University	0.43
3.	Farming experiences (years)	17.38±11.0
4.	Involved in farmer groups (%)	39.22
5.	Family size (person/family)	3.66±1.7
6.	Cattle ownership (heads/farmer)	4.94 ± 2.6

Beef Cattle Production and Management

Most TTS farmers (98.71%) raised Bali cattle as the main commodity in agricultural sectors. Based on BPS (2011), Bali breed was predominat cattle found in NTT, 87.84%. Data in Table 1 showed that 60.53% of farmer owned cattle on average of 4.94 ± 2.6 head/farmer, ranging from 1-10 heads/farmer. Few farmers (3.51%), owned more than 50 heads of cattle with an average of 78.00 ± 25.2 heads/farmer. This figure was doubly higher than the finding of Lake *et al.* (2010), that farmers in Belu District owned an average of 37 cattle/farmer, indicating that beef cattle was the main sources of farmer's income.

As shown in Table 2, Bali cattle were raised for different purposes; those were breeding (68.53%), fattening (14.22%) and combination of breeding and fattening (17.24%). Rearing systems consisted of tethered all day (18.11%), grazing at daytime and tethered at night (41.81%), and grazing all day (9.48%). Cattle were tethered near the house or in the garden.

Bali cattle was basically fed on farages. The cattle forages compraised native grass (30.98%), cultivated grass (29.38%), legume (25.51 %), and agricultural waste (14.12%). Generally, the forages were obtained from close pastures (35.45%), farmer garden (33.33%), and non-irrigated paddy fields (19.09%). The cultivated grass consisted of mainly *Pennisetum purpurhoides*, *Pennisetum purpureum*, and *Panicum maximum*, while common legume cattle feed were *Sesbania grandiflora*, *Leucaena leucocephala*, and *Acacia leucophloea*. The agricultural wastes widely used were banana stem, corn straw, green bean straw, cassava straw, and sweet potato straw. Adult cattle, young cattle, and calves were given forage 22.27 kg, 15.65 kg, and 8.25 kg, respectively. Rahmansyah *et al.*, (2013) stated that the concept of cattle rearings utilizing various species plants on dry land obtained from forest, gardens and dry fields was quite feasible for small-scale farmers in TTS District.

Table 2. Beef cattle production system in South Central Timor Regency (TTS)

No.	Variables (n=228)	Results (%)
1.	Main objective of raising cattle	
	Breeding	68.53
	Fattening	14.23
	Combination breeding and fattening	17.24
2.	Rearing system	
	Tethered all day	18.11
	Grazing day time and tethered at night	41.81
	Grazing all day	9.48
3.	Types of feed	
	Forages	65.04
	Forage and additional feed	28.93
	Additional feed additive	6.03
4.	Matting system	
	Natural matting	70.26
	Artificial insemination	1.72
	Others	28.02
5.	Birth and mortality rate	
	Birth rate	79.69
	Mortality rate of young animal	12.16
	Mortality rate of adult animal	7.18

Natural matings was applied by 70.26% farmers without considering the quality of breeding males, and 28.02% practiced mating systems that related to the raising patterns such as all-day-grazing or day-time grazing. Artificial insemination (AI) method was applied only by few farmers who implemented tethered and stall raising systems near farmers house or in the garden. Reproductive performances such as birth rate (79.69%), mortality rate of calf under one year old (12.16%), and the mortality of adult cattle (7.18%) occurred under such extensive rearing systems. Wirdahayati (2010) reported the average birth and death rates of Bali cattle under one year was 75 and 30% respectively. High adaptability of Bali cattle to the lack of feed and poor environment was one of the advantages to keeping this species in Timor island.

Constraints and Opportunities

This study showed that the main problems faced by farmers in South Central Timor Regency were the unavailability of feed and drinking water during such a long-critical dry season, poor animal health, and lack of farmers knowledge on breeding and reproductive management. The critical long dry period with during eight months resulted in poor and low quality feed available for animals. According to BPS Kabupaten TTS (2014), within the period of July and November 2013, was the lowest rainfall rate (0-362 mm/year). As a result, mortality rate of calves was (12.16% and adult animal 7.18% (moderate). The other inhibiting factors to cattle development programs included long chain marketing systems, poor feeding and breeding management and limited financial support for breeding program.

Improvements were required for cattle development in TTS, which included capacity building of farmers, provision technology for feeds and feeding, breeding and reproduction, disease control, and strengthening farmers groups to help an easy access to production input and marketing.

Conclusion

Bali cattle in Central Timor Regency has been well adapted to the local environment, had a relatively good reproduction rate, despite the high mortality rate, was potential to be improved as a source of income for small farmers in the region. Providing good quality feed and fodder through application of simple preservation, appropriate breeding systems and regular health and diseases control by Livestock Service Agency were some alternative solutions needed in improving cattle productivity. Training of farmers on the respective aspects, particularly related to appropriate management of cattle, including strengthening the existing farmers groups or institutions would be required.

References

- Amalo S, B Hartono, HD Utami. 2012. Model Simulasi Peningkatan Ternak Sapi Induk Pola Gaduhan terhadap Curahan Tenaga Kerja: Studi Kasus di Keca-matan Amanuban Selatan, Propinsi Nusa Tenggara Timur. *Sains Peternakan*. 10 (1): 30-38
- [BPS] Badan Pusat Statistik. 2011. Pendataan Sapi Potong, Sapi Perah, dan Kerbau 2011 (PSPK 2011) Provinsi Nusa Tenggara Timur. Jakarta : Badan Pusat Statistik.
- [BPS Kab. TTS] Badan Pusat Statistik Kabupaten Timor Tengah Selatan. 2014. Kabupaten Timor Tengah Selatan dalam Angka Tahun 2014 [Internet]. http://timortengah.selatankab.bps.go.id/?hal=publikasi_detil&id=141.
- Lake PRMT, A Kusumawati, S Budiharta. 2010. Faktor resiko Bovine Brucellosis pada tingkat peternakan di Kabupaten Belu, Propinsi Nusa Tenggara Timur. *J. Sains Vet*. 28 (1) : 1-8
- Rahmansyah M, A Sugiharto, A Kanti, IM Sudiana. 2013. Kesiagaan pakan pada ternak sapi skala kecil sebagai strategi adaptasi terhadap perubahan iklim melalui pemanfaatan biodiversitas flora lokal. *Buletin Peternakan* 37(2) : 95-106
- Ratnawaty S, DA Budianto. 2011. Peluang usaha penggemukan sapi dalam kandang kelompok di Desa Tobu, Kabupaten Timor Tengah Selatan, Nusa Tenggara Timur. *J. Ternak Tropika*. 12 (2): 52-59.
- Siswoyo H, DJ Setyono, AM Fuah. 2013. Analisis kelembagaan dan peranan-nya terhadap pendapatan peternak di Kelompok Tani Simpay Tampomas Kabupaten Sumedang Provinsi Jawa Barat. *Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan* 1 (3) : 172-178
- Suprana J. 2005. Pengembangan Mutu SDM dan Kepedulian Sosial sebagai Kunci Keberhasilan Usaha. Di dalam : B.S. Nugraha, I. Hamad, L. Tofi, N. Hifni, dan Kasta (editor). *Investasi Sosial*. Jakarta : Puspensos Latofi Enterprise.
- Wirdahayati RB. 2010. Penerapan teknologi dalam upaya meningkatkan produktivitas sapi potong di Nusa Tenggara Timur. *Wartazoa* 20 (1) : 12-20.
- Yusuf, J Nulik. 2008. Kelembagaan pemasaran ternak sapi potong di Timor Barat, Nusa Tenggara Timur. *Jurnal Pengkajian dan Pengembangan Teknologi Pertanian* 11 (2) : 132-144