MAJALAH ILMIAH PETERNAKAN – VOLUME 27 (3) 2024
P-ISSN: 0853-8999 E-ISSN: 2656-8373
https://ojs.unud.ac.id/index.php/mip
DOI: https://doi.org/10.2483/MIP.2024.v27.i03.p10

THE CHARACTERISTICS OF BREEDERS, MANAGEMENT PRACTICES, AND MARKETING EFFICIENCY OF BALI CALF CATTLE IN NUSA PENIDA, INDONESIA: A CASE STUDY

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ABSTRACT

This study analyzes the characteristics of Bali cattle breeders, management practices, and the marketing efficiency of Bali calves in Nusa Penida, Indonesia. Data from 60 breeders, 10 belantik (cattle traders), and 4 experts revealed a predominantly male-dominated sector with a high reliance on traditional, semi-intensive farming methods. Small-scale operations and limited market access, coupled with a long marketing chain involving belantik, significantly constrain profitability. Direct marketing, while less prevalent, demonstrates markedly higher efficiency and farmer's share. The findings highlight the need for interventions to improve market access, enhance farming practices, and strengthen farmer organizations to ensure the long-term sustainability of this important sector.

Keywords: bali cattle, belantik, cattle breeding, marketing efficiency, smallholder farming

KARAKTERISTIK PETERNAK, PRAKTEK MANAJEMEN, DAN EFISIENSI PEMASARAN SAPI POTONG BALI DI NUSA PENIDA, INDONESIA: STUDI KASUS

ABSTRAK

Penelitian ini menganalisis karakteristik peternak sapi Bali, praktik manajemen, dan efisiensi pemasaran pedet sapi Bali di Nusa Penida, Indonesia. Data dari 60 peternak, 10 belantik (pedagang ternak), dan 4 ahli menunjukkan sektor peternakan yang didominasi laki-laki dengan ketergantungan tinggi pada metode peternakan tradisional semi-intensif. Operasi skala kecil dan akses pasar yang terbatas, ditambah dengan rantai pemasaran panjang yang melibatkan belantik, secara signifikan menghambat keuntungan. Pemasaran langsung, meskipun kurang umum, menunjukkan efisiensi dan bagian bagi peternak yang jauh lebih tinggi. Temuan ini menyoroti perlunya intervensi untuk meningkatkan akses pasar, meningkatkan praktik peternakan, dan memperkuat organisasi peternak untuk memastikan keberlanjutan jangka panjang sektor penting ini.

Kata kunci: pedet sapi bali, belantik, pembibitan sapi, efisiensi pemasaran, peternakan rakyat

INTRODUCTION

Nusa Penida, a strategically important island off the coast of Bali, Indonesia, has been designated a primary breeding area for Bali cattle (*Bos sondaicus*) (Astiti, 2019; Dewi *et al.*, 2018). This designation is due to its unique geographical isolation, contributing to a population of cattle largely free from prevalent diseases. Bali cattle hold significant cultural and economic value within Indonesia, particularly in Bali, where they are deeply interwoven into the region's heritage and economic prosperity (Dewi *et al.*, 2021; Habaora *et al.*, 2019; Tahuk *et al.*, 2017; Talib *et al.*, 2003). Renowned for their resilience, adaptability, and superior carcass yield, this breed represents a valuable genetic resource for the nation.

Despite these inherent advantages, the marketing system for Bali calves in Nusa Penida faces considerable challenges. The absence of a local cattle market necessitates reliance on intermediaries, known as belantik, to access distant markets, primarily on the Bali mainland (Dewi *et al.*, 2018; Sukanata, 2015; Sukanata *et al.*, 2010). This reliance introduces significant transportation costs and inherent risks, including potential injury or mortality during transit. Furthermore, a lack of access to reliable market information and limited bargaining power among breeders often results in suboptimal prices for their calves. These factors collectively impede the economic potential of Bali cattle farming in Nusa Penida (Dewi *et al.*, 2018, 2021).

This study aims to comprehensively analyze the cha-

racteristics of breeders, their management practices, and the marketing efficiency of Bali calves in Nusa Penida. The research will identify potential strategies to enhance breeder income and promote the sustainable growth of the Bali cattle industry within this unique environment.

METHODOLOGY

This study was conducted in Nusa Penida, Klungkung Regency, Bali. Data were collected via a survey administered to 74 respondents, comprising 60 Bali cattle breeders, 10 belantik (cattle traders), and 4 experts in the field. To ensure a representative sample of breeders, a purposive stratified random sampling technique was employed, targeting all Bali cattle breeding groups across Nusa Penida's five villages. Within each group, three individuals (two managers and one member) were selected. Belantik respondents were identified using snowball sampling, leveraging referrals from breeder respondents to reach a broader network of traders. Experts were selected using purposive sampling, based on their recognized expertise in Bali cattle breeding, marketing, and economics.

Data analysis incorporated several methods: (1) Descriptive Statistics, were used to characterize the sample population and their farming practices; (2) Marketing efficiency analysis, assessed the efficiency of the existing marketing system for Bali calves in Nusa Penida. Calculations of farmer's share, margin, and overall efficiency were conducted for each identified marketing channel. This multi-faceted approach provided a comprehensive understanding of the Bali calf marketing system in Nusa Penida, enabling a robust assessment of efficiency and the identification of potential strategies for improvement.

RESULTS AND DISCUSSION

The findings of this research highlight several key factors influencing the management and marketing of Bali calf cattle in Nusa Penida.

Characteristics of Breeders

The demographic profile of Bali cattle breeders in Nusa Penida as shown in Table 1 reveals a predominantly male-dominated sector, with a high school education being the most common level of attainment. The majority of breeders have significant experience in cattle farming, with over 83% having been involved for more than 10 years. This suggests a strong foundation of knowledge and practical skills within the breeding community. However, the prevalence of small-scale operations, with most breeders owning only 1-3 cattle, is a common characteristic of livestock production in developing countries (Agus and Widi, 2018; Arief and Fitriani, 2018; Asikin *et al.*, 2020). This limited scale can restrict access to resources and technology, potentially impacting productivity and profitability.

The dominance of male breeders reflects the prevalent patriarchal social structure in Indonesia, where men often hold primary roles in agricultural decision-making and income generation (Amrawaty *et al.*, 2017; Doss, 2018; Joshi *et al.*, 2016; Nurtini *et al.*, 2019; Purnomo *et al.*, 2019). Addressing this gender imbalance and empowering female breeders could contribute to greater economic participation and empowerment within the Bali cattle sector.

The prevalence of small-scale farming, with most breeders owning only a few cattle, is a common characteristic of livestock production in developing countries (Achmad *et al.*, 2019; Arief and Fitriani, 2018; Rustandi and Ismulhadi, 2019). This limited scale can restrict access to resources and technology, potentially impacting productivity and profitability. Strategies to promote collective action, such as cooperatives or farmer groups, could help small-scale breeders access resources, improve their bargaining power, and enhance their overall economic viability.

Table 1. Characteristics of breeders in Nusa Penida

Characteristic	Frequency (n = 60)	Percentage (%)
Ages (years)		
24–34	13	21.67
35–44	28	46.67
45–54	12	20.00
55–64	5	8.33
>64	2	3.33
Education		
No formal education	4	6.67
Elementary school	19	31.67
Junior high school	17	28.33
Senior high school	10	16.67
College or University	10	16.67
Experience in cattle farming (years)		
≤ 5	6	10.00
6–10	4	6.67
> 10	50	83.33
Owning cattle (head)		
1–3	39	65.00
4–6	18	30.00
7–10	2	3.33
> 10	1	1.67
Motivation for breeding		
Conservating bali cattle	20	33.33
Saving or Additional income	37	61.67
Other	3	5.00

Notes: n = total respondents

The primary motivation for breeding Bali cattle – income generation and savings – underscores the importance of livestock as a vital economic resource for smallholder farmers, particularly in rural communities where alternative income sources may be limited (Code *et al*., 2019; Onduso *et al*., 2019; Yitayew *et al*., 2019). This motivation highlights the need for policies and programs that support the economic sustainability of smallholder cattle farming and provide access to markets, financial services, and training opportunities.

Management Practices

Bali cattle breeders in Nusa Penida have developed a unique blend of traditional farming practices and adaptations to the island's specific environment. Their management approach reflects both the constraints faced by smallholder farmers in developing countries and their deep knowledge of local resources. The semi-intensive farming system, relying heavily on traditional methods, is a common strategy in developing countries where access to resources like high-quality feed and veterinary care is limited (Sudita *et al*., 2019; Tahuk *et al*., 2017). However, this system presents opportunities for improvement. Introducing improved feeding strategies, disease prevention programs, and increasing access to veterinary services could significantly enhance efficiency and productivity. The reliance on forage as the primary feed source, while typical in many developing countries, highlights the need for more sophisticated feeding strategies, particularly during the dry season when forage availability is scarce (Sudita *et al*., 2019; Tahuk *et al*., 2017, 2018). Exploring alternative feed sources, such as crop residues or agro-industrial byproducts, or implementing improved forage conservation techniques could help mitigate these seasonal challenges.

The dependency on rainwater for water sources underscores the vulnerability of cattle production to drought conditions (Tahuk *et al.,* 2017). Investing in water harvesting systems, constructing water storage tanks, or exploring alternative water sources would significantly enhance resilience and ensure a sustainable water supply for cattle. While basic health management practices are in place, the need for improved veterinary care and disease prevention strategies is crucial for maintaining the health and productivity of the herd (Meuwissen *et al*., 2019; Tahuk *et al*., 2018). Increasing access to veterinary services, promoting vaccination programs, and providing training on animal health management are essential steps to ensure the long-term viability of the Bali cattle population in Nusa Penida.

The management practices employed by Bali cattle breeders in Nusa Penida reflect a combination of tradition and adaptation to local conditions, such as semi-intensive system, forage-based feeding, water management, and basic health management. The semi-intensive farming system, with its reliance on traditional methods, reflects the constraints faced by smallholder farmers in developing countries. Limited access to resources, such as high-quality feed and veterinary care, often necessitates the use of traditional practices. However, there is potential for improving efficiency and productivity through the introduction of improved feeding strategies, disease prevention programs, and access to veterinary services. The use of forage as the primary feed source, while common in many developing countries, highlights the need for improved feeding strategies, particularly during the dry season when forage availability is scarce (Bush *et al*., 2019; Meuwissen *et al*., 2019; Tahuk *et al*., 2018). This could involve exploring alternative feed sources, such as crop residues or agro-industrial byproducts, or implementing improved forage conservation techniques.

Marketing Efficiency

The marketing system for Bali calves in Nusa Penida exhibits a blend of direct and indirect marketing channels, with the presence or absence of marketing intermediaries (belantik) defining the pathway from breeder to final consumer. Analysis of survey responses from 60 breeders revealed that 32.75% sold calves directly to consumers (other farmers) within Nusa Penida, while 67.25% utilized belantik. This distribution reflects established practices and the constraints faced by breeders in undertaking direct marketing. Breeders generally direct calves of lower quality to belantik, retaining higher-quality calves for breeding or sale to other local farmers (Sukanata, 2015; Sukanata *et al*., 2010; Sumitra *et al*., 2013). The absence of a local market and the distance to mainland Bali markets significantly impact marketing options for Nusa Penida breeders. Individual breeders manage their own marketing, often selling only when needed or when market prices are favorable, further highlighting the constraints of small-scale operations.

Four distinct marketing channels emerged from the data, as illustrated in Figure 1. Channel I represent direct sales from breeder to consumer within Nusa Penida. Channels II, III, and IV involve belantik as intermediaries, with increasing complexity and numbers of intermediaries in each subsequent channel. Breeder responses indicated that the lack of direct access to markets, coupled with high transportation costs and risks, strongly influenced the preference for indirect marketing channels. However, the income generated through belantik was often deemed sufficient, leading to a perceived efficiency in this approach despite the longer chain.

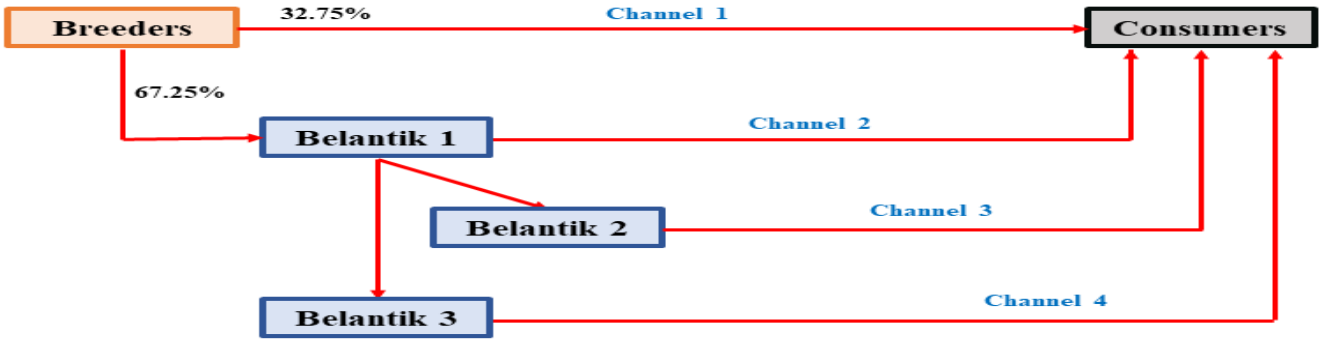

Figure 1. Marketing channels for bali calves in Nusa Penida

The long chain of intermediaries in the marketing system, with belantik playing a central role, is a common feature of livestock marketing in many developing countries (Chen and Lu, 2019; Dewi *et al.*, 2018; Dlamini and Huang, 2019; Kohls and Uhl, 1980; Mmbando *et al.*, 2017; Onduso *et al.*, 2019). While this system can provide a market for breeders, it often leads to lower prices for calves due to the multiple intermediaries involved, as shown in Table 2.

Channel I (direct marketing) exhibit 0% marketing inefficiency, as expected, given the absence of intermediaries. Channels II, III, and IV, incorporating belantik, show increasing levels of inefficiency (7.30%, 8.97%, and 10.56%, respectively), directly correlating to the number of intermediaries involved. This underscores the cost associated with longer marketing chains, consistent with established economic principles of marketing efficiency (Duungan *et al.*, 2017).

Farmer's share reflects the proportion of the final sale price received by the breeder. Channel I showed a 100% farmer's share, while this decreased progressively with the increased involvement of belantik (78.79%, 74.57%, and 70.78% for channels II, III, and IV, respectively). This decline in farmer's share directly reflects the costs and profits extracted by intermediaries at each stage of the marketing chain (Dewi *et al.*, 2021). The relatively high marketing efficiency, with farmer's share ranging from 70.78% to 100%, suggests that the marketing system, despite its length, is relatively efficient (Duungan *et al.*, 2017; Sukanata *et al.*, 2010). This efficiency is likely due to the limited number of intermediaries involved in the marketing process.

Table 2. Bali calves marketing channel analysis in Nusa Penida

Channel	I	II	III	IV
Breeders				
Marketing cost (IDR/head)	0	6,600	6,600	6,600
Selling price (IDR/head)	5,568,750	5,568,750	5,568,750	5,568,750
Farmers' share (%)	100	78.79	74.57	70.78
Belantik I				
Buying price (IDR/head)		5.568.750	5.568.750	5.568.750
Marketing price (IDR/head)		515.600	515.600	515.600
Selling price (IDR/head)		7.067.500	7.067.500	7.067.500
Belantik II				
Buying price (IDR/head)			7,067,500	7,067,500
Marketing price (IDR/head)			125,000	125,000
Selling price (IDR/head)			7,467,500	7,467,500
Belantik III				
Buying price (IDR/head)				7,467,500
Marketing price (IDR/head)				125,000
Selling price (IDR/head)				7,867,500
Consumer				
Buying price (IDR/head)	5,568,750	7,067,500	7,467,500	7,867,500
Margin (IDR/head)	0	1,498,750	1,898,750	2,298,750
Marketing inefficiency (%)	0	7.30	8.97	10.56

Marketing margins, representing the difference between the final consumer price and the breeder's price, increased progressively along the marketing chain. This pattern directly reflects the cumulative costs and profits extracted by each intermediary. This highlights the need for strategies to shorten the marketing chain and improve price transparency for breeders. The findings suggest that interventions aimed at improving market access and reducing the reliance on intermediaries could significantly enhance marketing efficiency and increase the share of income received by breeders. This could involve the development of local markets, improved infrastructure, and the provision of market information to breeders. Furthermore, initiatives to strengthen farmer cooperatives or other collective marketing arrangements could improve bargaining power and reduce the influence of intermediaries.

CONCLUSION

This study reveals a complex interplay of factors shaping the Bali cattle industry in Nusa Penida. While breeders demonstrate significant experience and a deep understanding of traditional farming practices, the prevalence of small-scale operations and reliance on indirect marketing channels through intermediaries (belantik) significantly constrain profitability. The findings highlight the need for interventions focused on improving market access, strengthening farmer cooperatives, enhancing farming practices, providing market information, and promoting training to ensure the long-term sustainability and economic viability of this important sector. These strategies are crucial for empowering breeders, increasing their income, and preserving the cultural and economic significance of Bali cattle in Nusa Penida.

REFERENCES

Achmad, F., J. H. Mulyo, Masyhuri, and Subejo. 2019. Factors affecting profit analysis of small-scale beef cattle farmers in the Special Region of Yogyakarta, Indonesia. *American-Eurasian Journal of Sustainable Agriculture*. 13(2): 1–12. https://doi.org/10.22587/aejsa.2019.13.2.1.

Agus, A. and T. S. M. Widi. 2018. Current situation and future prospects for beef cattle production in Indonesia - A review. *Asian-Australas J Anim Sci*. Asian-Australasian Association of Animal Production Societies.

Amrawaty, A. A., S. N. Sirajuddin, V. S. Lestari, and A. Abdullah. 2017. Gender analysis on beef cattle farm. *American-Eurasian Journal of Sustainable Agriculture*. 11(6): 42–45.

Arief, H. and A. Fitriani. 2018. Risk preference of farmer beef cattle smallholder in West Java. *IOP Conf Ser Earth Environ Sci*. 119(1). https://doi.org/10.1088/1755-1315/119/1/012065.

Asikin, Z., D. Baker, R. Villano, and A. Daryanto. 2020. Business models and innovation in the Indonesian smallholder beef value chain. *Sustainability (Switzerland)*. MDPI.

Astiti, N. M. A. G. R. 2019. Impact of bali cattle calf marketing to the farmers income. *Journal of Research on the Lepidoptera*. 50(4): 89–96. https://doi.org/10.36872/lepi/v50i4/201065.

Bush, S. R., P. Oosterveer, M. Bottema, M. Meuwissen, Y. de Mey, S. Chamsai, H. H. Lien, and M. Chadag. 2019. Inclusive environmental performance through 'beyond-farm' aquaculture governance. *Curr Opin Environ Sustain*. Elsevier B.V.

Chen, Y. and Y. Lu. 2019. Factors influencing the information needs and information access channels of farmers: An empirical study in. *J Inf Sci*. 1–20. https://doi.org/10.1177/0165551518819970.

Code, C. d. A. M., E. P. Supangco, S. S. Capitan, E. A. Aguilar, and J. T. Dizon. 2019. Characteristics of the exixting rainfed rice Bali Cattle production systems in Maliana, Bobonaro, Timor-Leste. *IOP Conf Ser Earth Environ Sci*, 1010. IOP Publishing.

Dewi, N. M. A. K., B. R. T. Putri, and I. W. Sukanata. 2018. Marketing strategy of Bali Calf to improve breeders' income in Nusa Penida Sub District, Bali Province. *Journal of Biological and Chemical Research*. 35(2): 318–322.

Dewi, N. M. A. K., S. P. Syahlani, and F. T. Haryadi. 2021. The choice of information sources and marketing channel of Bali cattle farmers in Bali Province. *Open Agric*. 6(1): 413–425. https://doi.org/10.1515/opag-2021-0018.

Dlamini, S. I. and W. C. Huang. 2019. A double hurdle estimation of sales decisions by smallholder beef cattle farmers in Eswatini. *Sustainability (Switzerland)*. 11(19): 1–27. https://doi.org/10.3390/su11195185.

Doss, C. R. 2018. Women and agricultural productivity: Reframing the Issues. *Development Policy Review*. 36(1): 35–50. https://doi.org/10.1111/dpr.12243.

Duungan, I. N. A., I. N. Suparta, and B. R. T. Putri. 2017. Analisis efisiensi pemasaran Sapi Bali di Kabupaten Bangli. *e-Journal Peternakan Tropika*. 2(3): 338–350.

Habaora, F., A. M. Fuah, L. Abdullah, R. Priyanto, A. Yani, and B. P. Purwanto. 2019. Economic analysis of bali cattle farm in timor island indonesia. *International Journal of Scientific and Technology Research*. 8(10): 1576–1582.

Joshi, K., H. K. Dash, and B. Gangwar. 2016. Exploring gender involvement in Agriculture decision-making:

A case study of Meerut district in Uttar Pradesh. *Journal of Human Ecology*. 54(1): 41–48. https://doi.org/10.1080/09709274.2016.11906985.

Kohls, R. L. and J. N. Uhl. 1980. Food Marketing Costs. *Marketing of Agricultural Products*. 222. New York: Macmillan Publishing Co, Inc.

Meuwissen, M. P. M., P. H. Feindt, A. Spiegel, C. J. A. M. Termeer, E. Mathijs, Y. de Mey, R. Finger, A. Balmann, E. Wauters, J. Urquhart, M. Vigani, K. Zawalińska, H. Herrera, P. Nicholas-Davies, H. Hansson, W. Paas, T. Slijper, I. Coopmans, W. Vroege, A. Ciechomska, F. Accatino, B. Kopainsky, P. M. Poortvliet, J. J. L. Candel, D. Maye, S. Severini, S. Senni, B. Soriano, C. J. Lagerkvist, M. Peneva, C. Gavrilescu, and P. Reidsma. 2019. A framework to assess the resilience of farming systems. *Agric Syst*. 176. Elsevier Ltd. https://doi.org/10.1016/j.agsy.2019.102656.

Mmbando, F. E., E. Z. Wale, and L. J. S. Baiyegunhi. 2017. The welfare impacts of market channel choice by smallholder farmers in Tanzania. *Dev Pract*. 27(7): 981–993. https://doi.org/10.1080/09614524.2017.1353066.

Nurtini, S., F. T. Haryadi, and F. K. Werdhani. 2019. Time allocation of family Labor in beef cattle farming based on gender. *IOP Conf Ser Earth Environ Sci*. 387(1). https://doi.org/10.1088/1755-1315/387/1/012092.

Onduso, R., J. O. Onono, and J. N. Ombui. 2019. Assessment of structure and performance of cattle markets in western Kenya. *Trop Anim Health Prod*. Tropical Animal Health and Production, Springer. https://doi.org/10.1007/s11250-019-02062-2.

Purnomo, S. H., R. T. Rahayu, A. I. Sari, and S. Emawati. 2019. Factors affecting entrepreneurial intentions among beef cattle farmers in Boyolali Regency, Central Java, Indonesia. *IOP Conf Ser Earth Environ Sci*. 1–7.

Rustandi, Y. and Ismulhadi. 2019. Cattle farmers' perceptions about livestock insurance proram in Lawang, East Java, Indonesia. *International Journal of Science and Economic Research*. 4(2): 1125–1138.

Sudita, I. D. N., I. G. A. M. P. Sanjaya, and N. K. Mardewi. 2019. Profile of feeding and nutrient fulfillment bali cows on farm management in Bali at dry season. 1–7. https://doi.org/10.4108/eai.30-10-2018.2281485.

Sukanata, I. W. 2015. Pemasaran sapi bali. 1–13.

Sukanata, I. W., N. W. Suciani, I. GN. Kayana, and I. W. Budiartha. 2010. Penerapan Kebijakan Kuota Perdagangan and Efisiensi Pemasaran Sapi Potong Antar Pulau.

Sumitra, J., T. A. Kusumastuti, and R. Widiati. 2013. Pemasaran ternak sapi potong di Kabupaten Ogan Komering Ilir, Sumatera Selatan. *Buletin Peternakan*. 37(1): 49–58.

Tahuk, P. K., E. Baliarti, S. P. S. Budhi, and Panjono. 2018. The effect of season on the feed quantity and quality and growth performance of male Bali Cattle fattened in smallhoder farms. *Buletin Peternakan*. 42(3): 203–209. https://doi.org/10.21059/buletin-peternak.v42i3.33058.

Tahuk, P. K., S. P. S. Budhi, Panjono, N. Ngadiyono, R. Utomo, C. T. Noviandi, and E. Baliarti. 2017. Growth performance of male Bali Cattle fattening fed ration with different protein levels in smallholder farms, West Timor, Indonesia. *Asian J Anim Sci*. 11(2): 65–73. https://doi.org/10.3923/ajas.2017.65.73.

Talib, C., A. R. Siregar, S. Budiarti-Turner, and K. Diwyanto. 2003. Strategies to Improve Bali Cattle in Eastern Indonesia. *Aciar Proceedings*. 82–85.

Yitayew, A., Y. A. Yigezu, G. T. Kassie, T. T. Deneke, A. Haile, H. Hassen, and B. Rischkowsky. 2019. Identification of strategies to improve goat marketing in the lowlands of Ethiopia: A hedonic price analysis. *Appl Econ*. 51(1): 61–75. Routledge. https://doi.org/10.1080/00036846.2018.1490693.