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# SEMI-EXTENSIVE BEEF CATTLE BREEDING MANAGEMENT IN DOMPU REGENCY, WEST NUSA TENGGARA

## Manajemen Pembibitan Sapi Potong dengan Sistem Semi Ekstensif di Kabupaten Dompu, Nusa Tenggara Barat

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## Abstract

Beef cattle farming in Dompu Regency, West Nusa Tenggara, is conducted semi-extensively for various purposes, including breeding. This study aimed to identify the beef cattle breeding management practices used by smallholder farmers in Dompu Regency. Data were collected through field observations and interviews using questionnaires administered to 133 farmers in two villages: Dorebara and Adu. The research variables included farmer characteristics, reproductive issues, preferred cattle breeds, breeding management, feeding practices, and livestock health control. The results showed that most farmers were of productive age, had completed secondary education, and operated their farms as a side business driven by economic and socio-religious motivations. The main challenges in semi-extensive beef cattle breeding were limited access to bulls, long calving intervals, and low body condition scores in cows. Farmers preferred Bali cattle and crossbred cattle, and continued to rely on natural mating because it is accessible and cost-effective. The use of legumes such as *Leucaena leucocephala* during pregnancy and lactation remains suboptimal, as knowledge of feed management is largely based on tradition. Livestock health programs have been supported by the government through annual vaccination campaigns, but farmers' awareness of livestock health remains low. Beef cattle productivity in semi-extensive systems can be improved through technical assistance, extension services, and better access to superior bulls and high-quality forage.

Keywords: Beef cattle, breeding, semi-extensive.

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**Abstrak**

Peternakan sapi potong di Kabupaten Dompu, Nusa Tenggara Barat (NTB) dilakukan secara semi ekstensif untuk berbagai tujuan, termasuk untuk kegiatan pembibitan. Penelitian ini dilakukan untuk mengetahui manajemen pembibitan sapi potong yang dilakukan oleh peternak rakyat di Kabupaten Dompu, NTB. Data dikoleksi dengan cara observasi lingkungan dan wawancara menggunakan kuesioner terhadap 133 peternak di dua desa, yakni Dorebara dan Adu. Variabel penelitian meliputi karakteristik peternak, masalah reproduksi, preferensi bangsa sapi untuk dipelihara, manajemen kawin ternak, manajemen pakan, dan kontrol kesehatan ternak. Hasil menunjukkan bahwa peternak berada pada usia produktif, memiliki latar pendidikan menengah, dan menjadikan peternakan sebagai usaha sampingan dengan motivasi ekonomi dan sosial-keagamaan. Permasalahan utama yang dihadapi peternak dalam kegiatan pembibitan sapi potong secara semi ekstensif meliputi keterbatasan akses pejantan, panjangnya interval kelahiran, dan rendahnya skor kondisi tubuh induk. Peternak lebih menyukai sapi Bali dan sapi persilangan, serta masih mengandalkan kawin alam karena kemudahan akses dan efisiensi biaya. Pemberian legum lamtoro (*Leucaena leucocephala*) saat bunting dan laktasi belum maksimal, dengan pengetahuan manajemen pakan yang lebih banyak diperoleh dari tradisi. Kontrol kesehatan ternak telah difasilitasi oleh pemerintah melalui kegiatan vaksinasi tahunan, akan tetapi kesadaran peternak terkait dengan kesehatan ternak masih rendah. Produktivitas pembibitan sapi potong dengan sistem semi ekstensif dapat ditingkatkan melalui pendampingan teknis, penyuluhan, dan akses terhadap pejantan unggul serta hijauan berkualitas.

Kata kunci: Pembibitan, sapi potong, semi ekstensif.

## INTRODUCTION

More than 70% of beef cattle farming in Indonesia is carried out by smallholder farmers (Agus & Widi, 2018). West Nusa Tenggara (NTB) is one of the five provinces in Indonesia with the largest beef cattle populations, reaching 811,000 head out of a national total of 11.7 million in 2024 (BPS, 2025). Dompu, one of the regencies in NTB, has agroclimatic conditions that are highly suitable for both extensive and semi-extensive beef cattle farming. Over the past decade, Dompu has become known as a major supplier of beef cattle for markets outside the island, particularly Java. This role is supported by the availability of grazing land, the prevalence of extensive livestock systems, and an average ownership of more than ten head of cattle per farmer. Dompu has even been designated as a crop-cattle integration area (corn and cattle), highlighting cattle as a priority commodity for development (Muktasam *et al.*, 2022).

The extensive livestock system involves free-range grazing in savannas, forests, or accessible pastures near farmers' homes. Its advantages include free access to forage and water, wide roaming areas, and reduced labor and maintenance costs. Cattle raised extensively also tend to be more resilient to tropical environmental conditions (Husni *et al.*, 2021). A semi-extensive system, on the other hand, allows cattle to graze freely in designated pastures or open communal areas, with animals sometimes penned in the afternoon for safety and ease of management. This system supports both natural-mating breeding activities and the fattening of offspring (Rauf *et al.*, 2015).

Semi-extensive systems offer advantages such as easier livestock control and consistent feed availability. However, they also have limitations, including relatively low productivity in terms of weight gain, challenges in disease control, and reliance on natural environmental conditions for feed supply (Hilmiati *et al.*, 2024). In addition, fattening male calves born from breeding programs can lead to a shortage of bulls in grazing areas, which may negatively affect natural mating success and overall cattle population growth (Hilmiati *et al.*, 2021).


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This study was conducted to assess the management practices used in semi-extensive beef cattle breeding systems among smallholder farmers in Dorebada and Adu Villages, Dompu Regency, NTB.

## RESEARCH METHODS

### Ethical Clearance

This study did not require ethical clearance because no treatment interventions were applied to the beef cattle observed. All data were obtained through interviews with cattle breeders conducting semi-extensive cattle production in two villages (Dorebara and Adu) in Dompu Regency, NTB.

### Research Subjects

The study was conducted through field observations and interviews with breeder respondents using a structured questionnaire. Respondents were individuals engaged in semi-extensive beef cattle breeding, including both local cattle (Bali, Sumbawa, Balinese, and Sumbawa crossbreds) and crossbred cattle (offspring of local breeds crossed with exotic breeds). A total of 133 respondents were selected through purposive sampling across two villages: Dorebara (8°34'49"S, 118°27'25"E) and Adu (8°42'53"S, 118°29'31"E).

### Research Design

Purposive sampling was used to select breeder respondents based on specific criteria: keeping cattle for breeding or combined breeding and fattening purposes, using a semi-extensive livestock system, and residing in eastern Dompu. Purposive sampling was applied to ensure the selection of farmers relevant to the study's objectives (Campbell *et al.*, 2020).

### Research Variables

The study variables included farmer characteristics, commonly encountered reproductive problems, preferred cattle breeds, farmer perceptions of natural mating versus artificial insemination (AI), feed management and legume use, and livestock disease control practices.

### Data Collection Method

Data were collected through interviews using a questionnaire. In total, 133 respondents were selected through purposive sampling from two villages in Dompu Regency. Farmer respondents were required to raise cattle for breeding or combined breeding and fattening, use a semi-extensive system, be willing to participate, and be accessible during the data collection period.

### Data Analysis

Data were analyzed quantitatively using Microsoft Excel, with results presented in the form of averages, standard deviations, and percentages for relevant categories.

## RESULTS AND DISCUSSIONS

### Results

The results of this study were obtained from interviews with 133 respondents engaged in semi-extensive cattle breeding involving both local and crossbred cattle in two villages (Dorebara and Adu) in Dompu Regency, NTB. Interviews were conducted using a questionnaire to assess the management practices of breeders.

According to Table 1, the breeders involved in cattle production were on average 43.79 ± 11.75 years old, and more than half (56.39%) had completed junior high school. Their primary source


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of income was agriculture, followed by livestock farming, daily labor, and other activities. The average breeder in Dompu owned 8.03 ± 3.08 cattle, and ownership was personal rather than as hired herders. Farmers had an average livestock experience of 21.45 ± 12.48 years and raised cattle mainly to support educational expenses, generate income, save money, support corn farming, cover Hajj expenses, and provide animals for seasonal sacrificial purposes.

Breeders frequently reported reproductive challenges. These included limited access to bulls for natural mating, long calving intervals, low body condition scores (BCS), low birth weights, high pre-weaning mortality, dystocia, and limited availability of frozen semen for AI (Table 2). In contrast, 17.68% of breeders stated that they did not experience these issues.

Table 3 shows that breeders preferred certain cattle types, including Bali cattle, Sumbawa cattle, Bali and Sumbawa crossbreds, and crossbreds resulting from mating local cattle with Bos taurus breeds such as Simmental, Limousin, and Angus. Many breeders continued to rely on natural mating, although some chose AI for specific reasons. Most breeders preferred bulls or frozen semen from Bali cattle (32.86%). Reasons for choosing natural mating included easy access to bulls in grazing areas (48.87%), high pregnancy rates (39.85%), and lower costs compared with AI (1.50%). Breeding decisions were mainly based on the availability of local bulls (43.24%) or their physical appearance (40.54%). Farmers who used AI did so largely because they lacked access to bulls (44.63%) and because crossbred calves had higher market value (39.85%).

Regarding feed management, 52.63% of farmers provided legumes to cows during pregnancy and lactation, which reflects moderate awareness of their benefits. However, 47.37% had not yet adopted this practice. Knowledge about legumes was obtained mostly from tradition (30.83%) and fellow farmers (29.32%), while only 21.80% came from agricultural extension workers (Table 4). Land ownership for growing *Leucaena leucocephala* legumes remained low, with only 32.33% of farmers owning land and 67.67% not owning land. Most farmers accessed *L. leucocephala* by foraging for wild plants (40.60%), while others used their own land, cut wild plants intentionally, or harvested directly from pastures.

For livestock health monitoring, the majority of farmers (91.93%) received assistance from the Animal Husbandry Service, including annual vaccinations and livestock registration (Table 5). When animals became sick, farmers most often practiced self-medication (26.64%), followed by contacting veterinary or paramedical personnel (21.52%), seeking help from other farmers (18.18%), and using traditional treatments (12.20%). Most livestock had been dewormed (58.65%). The remaining animals were dewormed during annual vaccination (4.51%), after calving (6.77%), or based on their condition (30.08%).

**Discussions**

In this study, the average age of farmers was 43.79 years, with approximately 8 years of livestock farming experience. This indicates that farmers are within the productive age group and are capable of managing livestock breeding activities (Endang *et al.*, 2025a). The education level was dominated by junior high and high school graduates, which shows that most farmers have a secondary education background that enables them to understand basic livestock management, although technical assistance is still needed to strengthen their capacity (Hilmiati *et al.*, 2024). The main source of income was agriculture, followed by livestock farming and daily labor, which suggests that livestock production is generally a secondary activity rather than the primary livelihood (Rauf *et al.*, 2015). The relatively small herd size indicates that livestock farming is practiced semi-intensively or traditionally. Farmers raise livestock for various reasons such as income generation, school fees, savings, Hajj expenses, sacrificial livestock, and farming capital. This shows that livestock production plays not only an economic


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role but also functions as a long-term financial and socio-religious strategy for farming households (Agus & Widi, 2018).

The most common reproductive problem reported by farmers was limited access to bulls, which indicates that natural mating remains the dominant breeding system and has not been fully replaced by artificial insemination (AI) technology (Widyas *et al.*, 2022). Long calving intervals and low body condition scores also hinder reproductive efficiency, and these issues are likely influenced by suboptimal feeding and health management. Other problems such as dystocia, pre-weaning mortality, and low birth weight reflect challenges in maintaining both maternal and calf quality (Burrow, 2019; Hilmiati *et al.*, 2024). Meanwhile, some farmers reported no reproductive issues, suggesting that this may be associated with extensive farming experience and the continued effectiveness of traditional practices in certain areas (Sodiq *et al.*, 2017).

This study shows that breeders tend to prefer Bali cattle and crossbred cattle because they value the adaptability of local breeds as well as the superior genetic potential of crossbreds (Suretno *et al.*, 2017). The use of bulls for natural mating remains dominant, primarily due to easy access in grazing areas. Farmers believe that natural mating offers high pregnancy rates, reduces the risk of dystocia, and is more economical than AI (Williams *et al.*, 2022). Most farmers rely on locally available bulls, while only a small proportion use AI because bull availability is limited, especially when bulls are diverted for fattening purposes (Hilmiati, 2019; Hilmiati & Panjaitan, 2016).

Feed management in semi-extensive systems plays an important role in improving productivity and maintaining livestock health, especially during pregnancy and lactation. Although some farmers provide legumes to pregnant and lactating cows, their use is still not optimal. The low utilization of legumes is associated with farmers' knowledge, which is shaped more by tradition than by technical information (Surahmanto *et al.*, 2015). Strengthening feed management through education and improved access to quality forage, including *L. leucocephala*, is essential for supporting the sustainability of extensive livestock systems (Hilmiati *et al.*, 2021; Hilmiati & Panjaitan, 2016; Shelton *et al.*, 2023).

Livestock health monitoring is necessary to maintain productivity and animal welfare, and support from relevant agencies is important. Some farmers manage minor illnesses independently through traditional methods, while others seek help from fellow farmers or contact veterinary or paramedical personnel. Preventive practices such as deworming are not yet carried out consistently, indicating the need to improve awareness and education. According to Hermansyah *et al.* (2021), extension services, improved access to livestock health facilities, and increased farmer awareness can enhance participation in more effective and sustainable livestock health management.

## CONCLUSION AND SUGGESTIONS

### Conclusion

Semi-extensive cattle breeding in Dompu Regency, NTB, is carried out by breeders who are generally within the productive age range and have substantial experience in livestock farming. However, most breeders still treat livestock production as a secondary activity rather than a primary source of income. The main challenges in semi-extensive breeding systems include limited access to bulls, low body condition scores, and reproductive problems that are influenced by insufficient feed availability and suboptimal livestock health monitoring.


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**Suggestions**

Technical assistance and extension services need to be strengthened on an ongoing basis, particularly in the areas of reproductive management, feed management, and livestock health. In addition, access to key resources such as superior bulls and high-quality forage should be expanded to improve the productivity and sustainability of semi-extensive cattle breeding systems.

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## Tables

Table 1. Characteristics of farmers using a semi-extensive system in two villages (Dorebara and Adu), Dompu Regency, NTB

| Description | Respondent (n=133) |
|---|---|
| Age (years) | 43.79 ± 11.75 |
| Education level (%) | |
| No schooling | 10.53 |
| Junior high school | 56.39 |
| Senior high school | 23.31 |
| Bachelor's degree | 9.77 |
| Source of income (%) | |
| Agriculture | 56.96 |
| Livestock farming | 19.62 |
| Daily labor | 14.56 |
| Others | 8.86 |
| Number of livestock owned (head) | 8.03 ± 3.08 |
| Livestock farming experience (years) | 21.45 ± 12.48 |
| Reason for raising livestock (%) | |
| Income | 30.00 |
| School fees | 30.31 |
| Savings | 21.88 |
| Hajj expenses | 5.94 |
| Seasonal 'eid al adha' suppliers | 4.06 |
| Farming capital | 7.81 |

Table 2. Livestock reproductive problems frequently experienced by farmers

| Description | Respondent (n=133) |
|---|---|
| Reproductive problems (%) | |
| Low BCS | 15.36 |
| Low birth weight | 6.09 |
| Long calving interval | 16.52 |
| Abortion | 1.45 |
| Limited access to bulls | 31.30 |
| Limited availability of frozen semen for AI | 0.29 |
| Dystocia | 5.51 |
| Pre-weaning mortality | 5.80 |
| No problems | 17.68 |

Abbreviations: BCS=Body Condition Score; AI=Artificial Insemination


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Table 3. Preferred cattle breeds and perceptions related to natural mating and AI

| Description | Respondent (n=133) |
|---|---|
| Preferred cattle breeds (%) | |
| Bali | 32.86 |
| Crossbred | 25.56 |
| Random cattle available in grazing areas | 10.25 |
| Local crossbreds | 31.33 |
| Reasons for using bulls (%) | |
| High pregnancy rate | 9.77 |
| More affordable than AI | 1.50 |
| Easily accessible in grazing area | 39.85 |
| Reduces dystocia risk | 48.87 |
| Methods of selecting bulls (%) | |
| Using bulls available nearby | 43.24 |
| Knowing the bull's origin | 6.76 |
| Observing physical/exterior traits | 40.54 |
| Specific cattle breeds | 9.46 |
| Reasons for using AI (%) | |
| No access to bulls | 44.63 |
| High value of crossbred calves | 15.79 |
| Unsuitable for grazing area conditions | 39.85 |

Table 4. Feed management and use of legumes (*Leucaena leucocephala*)

| Description | Respondent (n=133) |
|---|---|
| Provision of legumes during pregnancy and lactation (%) | |
| Yes | 52.63 |
| No | 47.37 |
| Source of knowledge on legume feed (%) | |
| Agricultural extension workers | 18.05 |
| Fellow farmers | 21.80 |
| Tradition | 29.32 |
| No information available | 30.83 |
| The ownership of *L. leucocephala* land | |
| Yes | 32.33 |
| No | 67.67 |
| Access to *L. leucocephala* legumes (%) | |
| Cutting wild *L. leucocephala* | 40.60 |
| Planting and cutting wild *L. leucocephala* | 28.57 |
| Planting and grazing wild *L. leucocephala* in pasture | 30.83 |


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Table 5. Livestock health control

| Description | Respondent (n=133) |
|---|---|
| Health control support from the Livestock service (%) | |
| Yes | 91.93 |
| No | 8.27 |
| Actions taken when livestock are sick (%) | |
| Self-medication | 26.64 |
| Traditional treatment | 12.20 |
| Seeking help from other farmers | 18.18 |
| Calling veterinarian or paramedic staff | 21.52 |
| Emergency kill | 3.64 |
| Deworming (%) | |
| After calving | 6.77 |
| Based on the animal's condition | 30.08 |
| Together with annual vaccination | 4.51 |
| Never dewormed | 58.65 |


Terakreditasi Nasional Sinta 4, berdasarkan Keputusan Direktur Jenderal
Pendidikan Tinggi, Riset, dan Teknologi No. 158/E/KPT/2021