IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 17, Issue 6 Ser. 1 (June. 2024), PP 10-17
www.iosrjournals.org

Reproductive Performance Of Female Bali Cattle In The Extensive And Semi-Intensive Rearing System

I Wayan Lanus Sumadiasa[1]*, Lalu Ahmad Zaenuri[1], Lukman Lukman[1], Enny Yuliani[1], Adji Santoso Dradjat[1]
[1] *Faculty of Animal Husbandry, University Of Mataram, Majapahit Street No. 62 Mataram 83125, West Nusa Tenggara, Indonesia*

Abstract:
This study aimed to determine the comparison of reproductive performance of female Bali cattle reared extensively versus (vs) semi-intensively. The research material was 90 head of cattle in Bolo District, Bima Regency. The samples were taken from villages with the highest, medium, and least populations. The variables observed were the age of puberty (AP), estrus cycle (EC), length of estrus (EL), first mating (FM), service per conception (S/C), gestation length (GL), first calving (FC), birth weight BW), post-partum estrus (PE), days open (DO), and CI. The results show, that AP was 19.94 ± 3.86 vs 16.97 ± 3.29 months, FM was 19.73 ± 4.07 vs 19.33 ± 3.55 months, EC was 19.52 ± 2.82 vs 17.26 ± 2.84 days, EL was 17.97 ± 2.57 vs 15.79 ± 2.67 hours, S/C was 2.64 ± 1.86 vs 2.33 ± 1.58 and the most was twice (33.33%) vs once (40%), and GL was 285.28 ± 9.10 vs 277.81 ± 7.11 days. The FC was 35.88 ± 3.56 vs 33.97 ± 3.09 months, BW of the male was 15.83 ± 4.70 vs 19.52 ± 3.98 kg and female was 16.66 ± 3.87 vs 17.21 ± 3.91 kg, PE was 3.49 ± 1.66 vs 2.53 ± 154 months after birth, DO was 110.73 ± 3.27 days (3.69 months) vs 108.02 ± 3.05 days (3.60 months), and CI was 14.49 ± 2.01vs 13.76 ± 0.03 months. In conclusion, the reproductive performance of female Bali cattle reared in semi-intensively rearing is better than extensively.

Keywords: *Bali cattle, extensive, rearing system, reproductive performance, semi-intensive*

Date of Submission: 03-06-2024 Date of Acceptance: 13-06-2024

I. Introduction

Bali cattle is the pure-breed and favorite livestock commodities in Indonesia which have the main characteristic of the ability to adapt to various environmental conditions with relatively fast growth. The cattle that originate from Bali Island have spread to all corners of the region, including West Nusa Tenggara (NTB) which is one of the development centers for beef cattle. The reproductivity and productivity of Bali cattle are quite high, with an average calving interval of 13.71 ± 1.06 months and a brood reproduction index of 0.88 ± 0.07 head/year (Prasetya et al., 2021). West Nusa Tenggara Province is one of the largest livestock-producing areas to fulfill national meat needs (Gunawan et al., 2017), and Bima Regency is one of the regions in NTB that have been raising beef cattle. The most rearing system of Bali cattle in Bolo District, Bima Regency is extensive.

The rearing system is one of the important factors that greatly determine the reproducibility and productivity of cattle. Generally, the rearing system is related to feed, health, security, and safety, as well as the growth of cattle. In the extensive rearing, cattle are released freely in forage and sleep on pastures or fields all day and night. In the semi-intensive system, the cattle are tethered in the shepherd's area from about 7 a.m. to 5 p.m., and at night are caged and given sufficient food. In the intensive system, cattle are kept in a cage both day and night, and the food given is cut and carried, even supplement food (Sari et al., 2021). Semi-intensive rearing systems have a better effect on the growth performance of cattle than extensive rearing systems (Prasetia et al., 2021). This will have a positive impact on reproductive performance such as age of puberty, first calving, calving interval (CI), calving rate (CR), service per conception (S/C), and days open (DO) (Rahayu, 2014).

The reproductive performance of Bali cattle reared extensively has not been much reported. Therefore, a study was conducted on the reproductive performance of Bali cattle in an extensive and semi-intensive rearing system located in Bolo District, Bima Regency. This study aimed to determine the comparison of reproductive performance of female Bali cattle reared extensively and semi-intensively. The results of this study are expected to be used as a reference for improving the rearing system to improve reproductivity and increase the productivity of Bali cattle.

II. Materials And Methods

Research Methods and Locations

This research uses a descriptive method. Reproductive performance data consists of primary and secondary data. Primary data was obtained through interviews with farmers and direct observation of livestock in the field. Secondary data was obtained from the Technical Implementation Unit of the Animal Health and Livestock Service Office in Bolo District. The location samples included each village with the highest, medium, and least cattle populations.

Research Materials

The material used was 90 female Bali cattle including 45 in the extensive rearing system and 45 in semi-intensive. Samples of cattle in each rearing system were taken randomly as many as 20 heads from a village with the highest cattle population, 15 heads in moderate, and 10 heads in the least population.

Research variable

The reproductive performance of female Bali cattle was divided into two groups, namely heifers and broodstock or cows. Variables of the reproductive performance of heifers included age of sexual maturity (puberty), cycle and length of estrus, and age at first mating. Variables of broodstock include service per conception (S/C), length of pregnancy, age at first calving, birth weight, post-partum estrus, days open, and calving interval.

Data analysis

Data were analyzed statistically including mean, standard deviation, and percentage. The comparison of reproductive performance of the two rearing systems was analyzed by student-t test using Statistical Program for Social Science (SPSS) V.16.

III. Results And Discussion

Bali Cattle Potential

Bali cattle are native Indonesian cattle that have specific features in the qualitative, quantitative, and reproductive characteristics. They have a brick red color of the body fur, white at the lips, legs, and buttocks, and black at the back lines and tail. Bali cattle can live in the wild, have workability, and good adaptation to the environment and food digestion, resistant to disease, except for being susceptible to Jembrana disease. They also have moderate body weight and size, however, the percentage of carcass reaches around 51 – 57%, and meat fat is about 2 – 6.9%. The reproductive performance of Bali cattle is very good, in which the fertility rate reaches 82 – 85% (Kepmentan, 2010; Widyas et al., 2022).

Bali cattle is a potential meat supplier on a local or national scale, so the quality and quantity of the production need to be maximized. The reproductive ability of Bali cattle is superior even under harsh environmental stress in both intensive and extensive rearing, with similar characteristics to the small cattle breeds in the Tropical-African savanna (Chamdi, 2005). In addition, the growth of Bali cattle is quite fast, with good fertility, and a low mortality rate (Siswanto et al., 2013).

Rearing and Reproduction System

A part of Bali cattle in Bima Regency is still reared traditional-extensively, in which the cattle are left free all day in wide open fields to look for their food to meet their needs for life and production. Traditional-extensive rearing causes low reproductive performance of cattle because it is difficult to control the estrus and mate (Hasman et al., 2021). The quality and quantity of forage is the main problem that often occurs during long dry seasons, resulting in high calf mortality and often conflicts of interest between breeders and food crop farmers (Ngongo et al., 2022).

In semi-intensive rearing, animals are tethered or released in a field during the day and caged at night, given forage as appropriate as needed, and even concentrated. These better rearing conditions will have a better effect on the reproductive performance of cattle. However, a study found that the age of cattle puberty in the extensive rearing system occurred earlier than in the intensive or semi-intensive (Herrera et al., 2011).

Reproduction is one of the body's physiological functions to produce a new generation (regeneration) to maintain the continuity of the living species. In addition, reproduction plays a very important role in the sustainability of livestock production. Rearing systems are related to feeding, the health of the body, and reproductive organs which have directly or indirectly affected livestock productivity. In intensive rearing, reproductivity and productivity are more optimal because they are supported by good food, cage, and health management, and can apply technology to support maximum reproductive potential. Factors that affect reproduction, especially environmental conditions that cause climate change, heat stress, nutritional balance, food sources, and water availability (Duran and Duran, 2020).

Qualitative and quantitative food is needed for the growth and maintenance of all parts of the body's organs including the reproductive organ. Reproductive organs that grow normally and healthily guarantee that the entire series of reproductive processes run well, from puberty to birth and the provision of milk for their calves. The feed ration must include high-quality forage, containing carbohydrates, protein, minerals, and essential vitamin supplements. In addition, attention must also be paid to the type, quality, quantity, and method of administration of food, and the balance of forage with the right concentrate (Anzar et al., 2003; Sandi et al., 2018).

Reproductive Performance

The results of this study indicate that the reproductive performance of Bali cattle reared in a semi-intensive manner is generally better than the extensive system. Reproductive performance is a condition that describes the ability of an animal to reproduce, especially in female cattle. Reproductive performance in this study was classified tor two categories female, namely the heifer and the broodstock Bali cattle. Indicators of heifer reproductive performance including of age at sexual maturity (puberty), cycle and length of estrus, and age at first mating. The reproductive performance of Bali heifers on extensive and semi-intensive rearing in Bolo District, Bima Regency is presented in Table 1.

Table 1. Reproductive Performance of Heifer Bali Cattle in Extensive and Semi-intensive Rearing in Bolo District, Bima Regency (n=90)

Variable	Extensive	Semi-Intensive	*p*
Age of puberty (months)	19.94±3.86	16.97±3.29	0.37
Age of first mating (months)	20.27±4.07	19.33±3.55	0.47
Estrus cycle (days)	19.74±2.57	18.29±2.84	0.39
Estrus period (hours)	18.28±2.57	16.23±2.67	0.37

Puberty is the process by which animals become capable of reproductive activity, and in females, there is a transition from inactive ovaries to the first heat appears. In the current study, puberty of female Bali cattle in semi-intensive rearing was faster than in extensive, but not significantly different (p=0.37). This is due to livestock eating patches up according to the conditions of the pasture. Some factors influencing the appearance of puberty including quality and quantity of food, management, genetics and social environment, breed, age, and area or rearing systems have a significant influence on puberty. Generally, puberty in Europe cattle occurs at the age of 527 – 565 days (17.6 – 18.8 months) and first mating can be conducted at the age of 2 years (Burn et al., 2010). According to Bakhtiar et al. (2015), the puberty of male Bali cattle is 16.80 ± 1.73 months and 20.45 ± 2.81 months in females. Puberty has a variation of 19.84 ± 3.33 months by natural mating and 21.74 ± 3.99 months by artificial insemination (Ramadhan et al., 2022), 22.09 ± 6.01 months in Sawan District, Buleleng Regency, Province of Bali (Mahasanti et al., 2021).

In semi-intensive rearing, the cattle are given additional food according to their needs. Adequate nutritional need is an important requirement for the health and normal growth of livestock, including its reproductive organs. Nutritional status and metabolic health are strongly related to reproductive success (Bisinotto et al., 2012). The functioning of the reproductive organs properly indicates that reproductive hormones have been produced which cause the appearance of the first estrus which is called puberty or sexual maturity. A whole series of reproductive processes can occur if the brain as the center control for excitation obtains sufficient protein intake to control the release of reproductive hormones (Sonjaya et al., 2020).

The age of puberty is closely related to the time of mating and first calving. The age at first mating of Bali cattle reared semi-intensively was 12 days faster compared to extensive. In extensive rearing systems, the first mating often occurs when puberty or first heat because the heifers are released, and mating occurs naturally. The cattle are released in forests, rice fields, gardens, and mountains for months, and some even throughout the year making the mating difficult to control. The age at first mating of Bali cattle in this study was earlier than that presented by Prasetya et al. (2021), namely 26.55 ± 5.02 months and first calving at 36.76 ± 5.03 months.

The first mating in extensive rearing can occur at the age of 15 months even though the cattle are still immature because the heifers are released in grazing areas in which males and females mix. Cattle that are mated before reaching physical maturity can cause growth retardation in the cow, a low percentage of pregnancies, the calf born relatively small and weak, and high mortality. In principle, is not good to mating heifers if they have not reached physical maturity for around of 15 – 20 months in beef cattle. Some studies found that heifers in northern Australia had not yet reached puberty at the time of first mating, but had to be supported with a higher level of nutritional management and costs to minimize the reduction in body size at maturity (Burn et al., 2010). Heifers in the tropics can be mated first time at 15 months of age even though puberty only occurs at the age of 11-25 months because around 65% have reached their mature weight (Duran and Duran, 2020).

The age of the first mating is very important to start the production of livestock. The heifers can be set at the appearance of the third heat, in which they are declared to have reached physical maturity and to accept and maintain pregnancy, as well as undergo a normal birth process. In Bali cattle, the first mating is carried out at the age of 23.80 ± 2.25 (Bakhtiar et al., 2015); at 20.15 ± 4.45 months with a service per conception (S/C) of 1.79 ± 1.03. (Haryanto et al. (2015). Heifers that have been mated and gave birth earlier will be in the group longer than those that give birth later (Funston, 2014).

The estrus cycle of Bali cattle reared extensively in Bolo District was 18.58 days and the most occurred at 20 – 21 days (44.5%). The duration of estrus ranges from 12 – 24 hours with an average of 18 hours, but often occurs in around of 16 – 17 hours with the average of 17 hours (26.8%). The estrus cycle in semi-intensive rearing was 17.37 days and the highest was 18 – 19 days (26.7%), while the estrus period was 15.97 hours and the highest was 14 – 15 hours (37.8%). The current study found the estrus cycle was slightly shorter than the result found by Budisatria (2021), namely 20.55 ± 0.50 days in Bali cattle in South Konawe Regency. This difference may be due to different regional conditions, including temperature, season, and feed management. The duration of estrus in Bos Taurus and Bos Indicus were 11 – 21 hours and 10 – 15 hours respectively (Cooke et al., 2020).

Period of the estrus can affect fertility, in which theoretically cows that have a long estrus period will be more fertile than those with a short estrus. The result of this study shows that the cycle and duration of Bali cattle estrus reared extensively and semi-intensively in Bolo District were not significantly different (p=0.39) although on average there were differences of about 2 days and 2 hours. This was due to the availability of sufficient food, a good environment, and management, which will speed up the cycle and duration of estrus. The emergence of estrus varies greatly which is influenced by rearing systems, feeding, type of food, and frequency of drinking water (Kibre et al., 2022).

The results of this research show, that almost all of the respondents knew the symptoms of estrus, namely 25.56% restless cows, 46.47% restless and loud or noisy sounds, 20% restless accompanied by red vulva. About 8.89% of respondents were also said the cows prancing and chasing each other. In this study, there were no livestock experiencing silent estrus or did not show clinical symptoms of estrus. According to the respondent's answer the cycle and period of Bali cattle estrus reared semi-intensively was faster than extensive. In general, the normal estrus cycle occurs 18 – 24 days with an average of 21 days. Many factors influence the estrus cycle, including genetic and environmental factors such as temperature, food availability, rearing location, and disease (Siswanto et al. (2013).

The second category is the reproductive performance of cows including the variable of service per conception (S/C), gestation period, age at first calving, calf birth weight, post-partum estrus, days open, and calving interval. The reproductive performance of Bali cows in this study is presented in Table 2.

Table 2. Reproductive performance of Bali Cows under extensive and semi-intensive rearing in Bolo District, Bima Regency.

Variable	Ekstensive	Semi-intensive	*p*
Service per conception (S/C)	2.64±1.86	2.22±1.51	0.16
Gestation period (days)	285.28±9.10	277.81±7.11	0.48
Age of first calving (months)	35.88±3.56	33.97±3.09	0.45
Birth weight (kg)	male: 15.83±4.70 female: 15.66±3.87	Jantan: 19.52±3.98 Betina: 17.21±3.91	0.27 0.39
Estrus post-partum (months)	3.49±1.66	2.53±1.54	0.13
Calving interval (months)	14.49±2.01	13.76±0.03	0.46
Days open (days)	110.73±3.27	108.02± 3.05	0.48

Service per conception (S/C) is the number of mating services to obtain one pregnancy. This is important to determine the fertility of the female ovum and male spermatozoa that are used in mating. Service per conception of Bali cow reared extensively in Bolo District, Bima Regency was higher than semi-intensive, but not significantly different (p=0.16). A good S/C is 1.15 – 1.24 (Funston, 2014). In extensive rearing, the S/C varies between 1 – 7, and the most are 2 (33.3%), while in the semi-intensive system is the most 1 (40%) and 2 (33.3%). Bali cattle reared extensively only feed grass and forage in the field quality and quantity.

Service per conception is the amount of semen (straw) used divided by the number of cows that were successfully pregnant, 1.39 – 1.46 for Bali cattle at Techno Park Banyumulek, Wst Nusa Tenggara Province (Gunawan et al., 2017). Furthermore, it was explained that the conception rate (CR) is the number of cows that were successfully pregnant at the 1st AI divided by the number of inseminated acceptors times one hundred percent. According to Siswanto et al. (2013), S/C was 1.65 ± 0.87 of Bali cattle in the Pulukan Breeding Installation, Bali, and 1.49 – 2 in Jayapura, 1.49 – 2 (Koibur, 2005), and CR 45 – 48 .88% for Bali cattle in Pemayung District, Batanghari (Hoesni, 2015).

Table 2 shows, that the average gestation period of Bali cattle reared in a semi-intensive system was 275 days (37.8%). The results of these studies show, that the gestation period was shorter than Bali cattle in

Keerom Regency, Papua Province, and their crosses, 285 and 287 days (Kocu et al., 2019). According to Bakhtiar et al. (2015), the gestation length of Aceh cows was 274 days in females and 279 days in male calves. The gestation period of Bali cattle that reared extensively was longer than semi-intensive due to poor management. The food consumed is only for basic life necessities (maintenance) and never given additional food or concentrates.

The average gestation period of Bali cattle inseminated with Brahman cattle sperm was 9.03 ± 0.38 months (270.9 days) with the age of first insemination being 23.63 ± 1.99 months, S/C was 1.56 ± 0.55 and calving interval was 12.24 ± 0.52 months (Irwansyah et al., 2021). Meanwhile, the average gestational length of crossbreed dairy cows was 274.4 days with an average birth weight was 41.73 kg. The calf born less than the average of gestational length generally had lighter birth weights (Rezende et al., 2020).

Many factors affect the gestation period, including genetic, maternal, fetal, and environmental. A low level of food tends to prolong the gestation period. Furthermore, it was explained that the factors that affect the gestation period are the type of livestock, number and sex of the offspring, age of the cow, season, and geographical location. The average gestation period for Holstein cattle was 284.6 ± 1.9 days for males and 280.3 ± 1.5 days for females, 282.4 ± 2.5 days for single births, and 276.0 ± 1.6 days for twins (Ryoung-Hoon and Gyu-Jin, 2019).

In general, the age of first calving of Bali cattle reared extensively in Bolo District, Bima Regency varies between 26 – 41 months (± 35.88 months), and the most at 38 – 39 months (28.9%). In semi-intensive rearing, the first calving occurred faster, 33.97 months, and the most between 32 - 33 months (33.33%). Factors that affect the age of first calving in Bali cattle were the quantity and quality of food, rearing management, genetics, and environment. According to Siswanto et al. (2013), the average age of Bali cattle calving was 1104.61 ± 23.82 days. The age at first calving is a feature of sexual precocity and reproductive efficiency, which can be achieved if the calving interval is 365 days or one litter per year (Lacerda et al., 2018).

The birth weight of Bali cattle in Bolo District varies between 10 – 27 kg. The highest birth weight of males was 12 – 13 kg (24.44%) in extensive rearing and 22 – 23 kg (33.33%) in semi-intensive. The birth weight of females was 14 – 15 kg (24.44%) in extensive rearing and 18 – 19 kg (28.89%) in semi-intensive. The birth weight of Bali cattle reared in a semi-intensive system is heavier than that of extensive rearing because the food given is under the maintenance needs of the cow and the development of the fetus in the womb. The cattle reared extensively only receive a patch-up feed from the pasture location. The birth weight of Bali cattle ranges from about 10 – 27 kg, mostly 10.5 – 22 kg (18.9 ± 1.4 kg) for males and 13 – 26 kg (17.9 ± 1.6 kg) for females (Prasojo et al., 2010).

Post-partum estrus and return to mating after calving of Bali cattle reared extensively varies between 1 – 3.5 months with the highest frequency (24.4%) after 3 months, whereas in semi-intensive the most was 2 months. Post-partum estrus and return to mating in intensive rearing is around 64.5 days with a pregnancy rate are 53.8 to 100% and S/C are 2.2 to 2.5 by increased food (Baco et al., 2020). According to Haryanto et al. (2015), the first heat after calving was an average of 57.86 ± 55.23 days with post-partum mating an average of 66.44 ± 59.03 days in Pringsewu Bali cattle, and 127 ± 33.13 in Aceh (Bakhtiar et al., 2015).

Cattle reared in a traditional system in which the calf weaning naturally and delayed, so the return to mating after calving takes a longer period than in intensive or semi-intensive ($P<0.05$). However, too early mating after calving affects a low conception rate. The time for recovery of the uterus back to its original state (uterine involution) is around 60 days, so mating in 60 days after calving is essential to obtain 12 months of calving interval. The reproductive performance of Bali cattle mated naturally is better than artificial insemination. The post-partum estrus will occur at 48.94 ± 12.75 vs 82.74 ± 26.51 days, post-partum mating at 59.00 ± 14.00 vs 85.64 ± 25.45 days, and calving interval 348.57 ± 18.20 vs. 393.19 ± 31.05 days (Ramadhan et al., 2022).

A cow that has just calved should wait around of 60 – 90 days to be mated again even though the heat signs showed 50 – 60 days after calving. A hurry mating carried out before 60 days will cause the failure rate quite high because it is related to the time of uterine involution after calving. Uterine involution occurred according to the parity (frequency of calving) of the cow, 5.31 ± 10.63, 47.56 ± 12.64, and 48.4 ± 9.93 days respectively at parity I, II, and III. The estrus of parity I, II, and III will appear after 83.5 ± 25.74, 68.23 ± 22.8, and 74.10 ± 24.75 days after calving (Hadisutanto et al., 2013).

The calving interval (CI) of Bali cattle in extensively rearing ranged from 10 – 17 months and the most was 16 months (26.7%), whereas in semi-intensive the most in 13 months (37.8%). The results of this study following the exposure of Siswanto et al. (2013), average 350.46 ± 27.98 days, and Yakubu et al. (2019), 489.84 ± 4.53 to 495.73 ± 2.20 days (16.3 – 16.5 months) on small-scale farms in the tropical savanna of Guinea. The calving interval is influenced by environmental factors, especially the availability of sufficient feed throughout the year and the time of mating after calving, an average of 13.07 months (Pian et al., 2020).

Reproductive efficiency is considered good if the CI does not exceed 12 months or 365 days, and must be supported by mating after calving in around 85 – 95 days. The calving interval of Bali cattle reared in the semi-intensive system was significantly ($P<0.05$) shorter than in the extensive due to better handling of

reproduction before and after calving. The CI of Bali cattle in Timor Island was 2.8, 2.7, 2.5, and 2.4 years respectively in garden, agriculture, pastoral, and forest areas (Habaora et al., 2019). The wide range of CI is closely related to livestock conditions, rearing management, days open (DO), estrus post-partum, and timing and mating techniques.

Referring to Table 2, the DO of Bali cattle reared extensively and semi-intensively in Bolo District, Bima Regency varies quite a bit, but is not significantly different ($p = 0.48$). In extensive rearing, it ranged of 100 – 140 days, and the most (28.9%) in 125 – 130 days (± 127, whereas in semi-intensive it was mostly (33.3%) in 109 – 110 days (± 33 months). Days open is the period of days from the cow calving until they become the next pregnancy. This period is important because it will determine the CI of livestock in various rearing systems. In extensive rearing, there is a lack of human intervention in cattle reproductive activities, so the possibility of DO is longer than in semi-intensive. The results of this study indicate that the DO range of Bali cattle in various wet areas is almost the same, ranging from 106 ± 25.01 to 130.24 ± 38.31 (Supriyantono et al., 2008).

Reproductive performance and production of Bali cattle are also influenced by the characteristics or identity of the farmers. The current research resulting in the characteristics of farmers on extensive and semi-intensive rearing in Bolo District was quite varied. The educational characteristic of the majority of farmers in Senior High School and the equivalent was 42.22% vs 51.11%, followed by Elementary School 33.33% vs 26.67%, Junior High School 11, 11% vs 8.89%, not attending school 11.11% vs 6.67%, and graduate education 2.22% vs 6.67%.

Farmer age varied from 28 to 76 years (± 52 years) vs 18 to 68 years (± 43 years). The average farming experience is more than 3 vs more than 2 years. Number of cows owned 3 to 40 heads (maximum 5 to 7 heads) vs 3 to 16 heads (maximum 3 to 5 heads). Rearing methods are still traditional, in which the cows were released for a long month to years in open fields, mostly in mountains and forests. On the other hand, in semi-intensive rearing, the cows are released throughout the day from 7 a.m. to 5 p.m., and at night they are kept in pens and given grass, forage, and additional feed, as well as drinking water according to the livestock's need. Farmers generally provide food for their livestock in the form of straw, field grass stems, and crop waste.

Generally, the health of cows has not been taken properly because of a lack of farmer knowledge about diseases. Prevention and treatment of disease were carried out by traditionally trial and error by the majority (52%) of the community, while treatment was carried out by a veterinarian or paramedic (27.32%), and about 14.75% of cattle are usually sold or not treated when suffering a pain. The diseases that often suffered by cattle were diarrhea, flu, snoring, sore eyes, skin diseases, runny nose, and stomach pain. In extensive rearing, farmers usually did not know about the occurrence of reproductive failure because the cows were released for days, months, and even annual. Meanwhile, in semi-intensive rearing, farmers know the reproductive failure occurrence, such as dystocia cases (12.70% of farmers), the lack of energy of cows, and weakness at calving (about 10.24% of farmers). Handling of the case was carried out alone (± 5.45%), but some had contacted the nearest paramedical.

IV. **Conclusions And Recommendations**

The reproductive performance of Bali cattle in semi-intensive rearing was better than extensive. It is recommended to apply semi-intensive rearing to increase the reproduction, production, and population of Bali cattle.

Acknowledgments

The authors gratefully acknowledge the contribution of the Institute for Research and Community Service, LPPM University of Mataram for supporting funds.

Conflict Of Interest

The authors state that no conflict of interest.

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