



Effect of Bulls on Birth Rate and Birth Weight by Using Semi-Intensive Bali Cattle Maintenance

AUTHORS INFO

Andi Anjar Wawo
Fakultas Peternakan, Universitas Hasanuddin
Email: andi.anjarwawo@gmail.com
+6285241878200

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Abstract

This study was to know the effect of the Bull on conception rate and birth weight of Bali cattle raised with semi-intensively. This study uses an entirely randomized design (CRD) with four treatments with unbalance data. The survey conducted during a three months period of December 2012 to February 2013, at the Laboratory of beef cattle Production, Faculty of Animal Science, Hasanuddin University, Makassar. Materials of the study were as four bulls of dams Bali cattle with age from 2.5 to 4 years, 12 Bali cows, and 55 calves born from 2005 through 2012. The animals house throughout the year and they were exercise and grazing, approximately 4 hours in the daytime until afternoon. In the house, the animals were fed using elephant grass, additional feed (rice brian), salt, and water ad libitum. The results of this study showed that conception rate and calving rate of Bali cattle raised semi-intensive were 95.62% and 86.25% respectively. The average birth weight was 13,06 kg. It can be concluded that the conception rate and birth weight is affected by them ales, while the calving rate no significant effect of Bull.

Keywords: Bali cattle, bull, conception rate, birth weight

A. Introduction

Bali cattle is the original broiler of Indonesia and is the domestication of Banteng (*Bos-bibosbanteng*) (Hardjosubroto, 1994), and first island cattle (Sutan, 1988). Bali beef cattle are excellent for beef cattle in Indonesia, because of their high reproductive capacity, and using as working animals in paddy fields and fields (Putu, Situmorang, Lubis, Chaniago, Triwulaningsih, Sugiarti, Mathius, & Sudaryanto, 1998), high carcass percentage, lean meats, high positive heterosis on crosses (Pane, 1990). High adaptability to the environment and the rate of births can reach 80 percent (Tanari, 2001).

Entering the year 2000 the number of cattle population reached 718,164 tails, in 2001 to 722,452 tails and the next year tends to decline, as in 2006 to 637,128 tails. Factors contributing to the above decline have seen in the study of cut-rate data, the rate of cattle expenditure, the price of income and birth rate in 2005. The reduction of beef cattle during the period of 2002 - 2006 was 2.63% per year, this is allegedly due to: a) unbalanced between meat production and

demand, b) the high number of productive female slaughterhouses and community awareness/breeders will minimize prolific female slaughter is still low, c) low birth rate and calf harvest, e). The level of cattle expenditures for inter-island trade purposes is not controlled, especially the broiler inter-island illegal,). Loss of population buffer areas included in the territory of West Sulawesi and 6). No programmed nursery (Sonjaya, 2012).

Bull is a thing to be considered to increase population and productivity in beef/broiler farms. The male will marry the parent resulting in conception and produce a new calf. Birth weight is also inseparable from the influence of bull where only certain males who can deliver high birth weight. These were the basis of research on the impact of bulls on conception rates and keep birth weight in Bali cattle at Hasanuddin University Cut Laboratory livestock.

The decline in livestock productivity is thought to be caused by conception rates and lower birth rate (birth weight). The influence of males is one of the factors that influence marriage so that the occurrence of conception, birth and high birth weight of calf. Therefore, it is necessary to assess how far the influence of males on conception rate and birth weight of Balinese cow-calf

B. Methodology

1. The Material

The material of this research is using Bali cattle which consist of: 4 male tail, 12 head of mother and 55 calves kept at Cattle Laboratory, Faculty of Animal Husbandry, Hasanuddin University, Makassar, Data collected starting from 2005 - 2012 from note and observation directly.

2. Livestock Maintenance

The management of Bali cattle at the Cattle Laboratory is semi-intensive maintenance that combines ranching and shepherding. The marriage system is done naturally (using a stud). Table 1 Showed the distribution of male usage.

3. Research Procedures

This research used by processing the data obtained from Livestock Breeding Laboratory of Husbandry Faculty, Hasanuddin University, Makassar. Based on the records obtained from parent conception data, birth, and childbirth weight, from each male each year. The bulls used were four from 2006 to 2012 (Table 1).

Table1. Distribution of using bulls and number of cows by Year of Birth.

Bull	Year of birth						
	2006	2007	2008	2009	2010	2011	2012
P1	6						
P2		7	9				
P3				8	9	11	
P4							13

4. Parameter of Research

The parameters observed in this study were:

a) Rate of Conception

The Conception rate is the number of pregnant cattle in one year. The indicator for measuring conception rates that are often used is the number of broodstocks in 1 year divided by the number of females in productive.

b) Rate of Birth

The birth rate or crude birth rate (CBR) is the average number of livestock born in each year. The birth rate is calculated by the formula $CBR = N / R \times 100\%$, N is the number of births in that year and R is the number of pregnant female mothers in the population.

c) Weigh of Birth

Birth weight is the result of weighing of the new calf. Birth weight is obtained by considering calves no later than one day (24 hours) after birth.

5. Data Analysis

The data obtained were analyzed using Randomized Complete Randomized Design (RAL) with four different treatments and replications. If the treatment has a significant effect, then further test is done to distinguish the effect of treatment. The data analysis by using the following formula (Gasperz, 1991):

$$Y_{ijk} = \mu + \alpha_i + \epsilon_{ij}$$

Explanation:

Y_{ijk} : The observations for the i-th bull factor and the jth replication.

μ : Common middle value.

α_i : Influence of ith bull factor (i =1, 2, 3, 4).

ϵ_{ij} : Random effects (experimental error) at the i-th stage (bull factor) and on j-th repeat (j =1,2, 3, ... n).

In this analysis the data on conception rate, birth and death were analyzed based on descriptive and Chi-square analysis. The data analysis by using the following formula (Gasperz, 1991):

The formula of Chi-Square:

$$X^2 = \sum (\frac{fo - fh}{fh})^2 fh$$

Explanation: X^2 =Chi Square;
fo =frequency observed
fh =expected frequency

C. Result and Discussion

1. Rate of Conception

The conception rate of Bali cattle from 2006 to 2012 based on males from 2006 to 2012 at the Livestock Breeding Laboratory of Hasanuddin University Faculty of Animal Husbandry (Table 2.)

Table 2. Rates of conception, birth rate, and average birth weight of Balinese cow-calf based on different Bulls.

Bulls (P)	N	Conception Rate	Birth Rate	Average of Birth Weight
		%	%	%
P1	6	100	66,66	12,5 ± 1,3 ^{bc}
P2	16	93.75	86,67	11,92 ± 1,3 ^c
P3	28	96.43	100	14,37 ± 1,4 ^a
P4	13	92,31	91,67	14,23 ± 2,1 ^{ab}
Average		95,62	86,25	13,06 ± 1,8

Explanation: Different superscripts on the same column show very significant differences (P <.01), P1= First bull, P2=Second bull, P3= Third bull, and P4 = fourth bull.

Based on Table 2, it shows that the percentage of conception rates of mothers from different males. At P1 is the highest parent conception rate reaching 100%, this is because all parent mated with P1 is pregnant. Although all pregnant women but the lowest average birth rate of 66.66%, this is caused by the abortus parent (miscarriage). While for the lowest conception rate is P4 is 92% and birth rate 91.66%, this is caused by some parent mated with P4, not all conception and pregnant parent occurs abortus (miscarriage), so that design and birth rate does not reach 100 %. Although The conception rate of P2 is higher than conception rate of P4, the birth rate is lower. While at P3, conception rate 96.43% but birth rate reach 100% because all concept cows give birth

Based on the percentage of conception rates in Table 2, known that there are three groups of males whose conception percentage is less than 100%. The low conception rate of mothers

coupled with P2 and P4 compared to other mothers was due to a non-pregnant parent that year, and the newborn was pregnant the following year due to repeated mating. The average conception rate obtained in the study is 95.55%.

Repeat breeding is a female cow that has regular cycles and periods of marriage that have been rated 2 or more times with a fertile male or inseminated with fertilized fertile cement but still not pregnant. Factors of failure of fertilization are the main factors causing repeated cow mating. Although the failure of fertilization occurs in female animals, the causal factors also occur in male animals or can be caused due to management factors that are less good.

Based on the results of Chi-square analysis ($X^2_{count} < X^2_{\alpha} = .05 = .96 < 9.49$), showed that the bulls had a significant effect on the conception rate. The point means that cows are related to conception rates. The end is because the males are in a genetic factor that intimately affects the marriage to produce offspring as well as male fertility, marital management, feed availability, and maintenance management that have more influence on conception rates. It is by the opinion of Jakob (1994) which states that the conception rate on the control of beef cattle population depends on the fertility of male and female beef cattle as well as the quality of marital management. It is corroborated by Salisbury & Vandemark (1985) that the influence of males on the fertility of female cows and bulls is difficult to know because the factors are so complex and numerous. Environmental factors such as seasons each year, factor management and dietary factors affect more cows than males. Susilawati, Srianto, Hermanto, & Yuliani (2003) stated that males aged 2 to 7 years could produce the best cement with high conception rates in females who are married compared to males aged beyond that interval.

2. Rate of Birth

Based on Table 2. it can be seen that birth rates from mains mated to P1, P2, and P4 do not reach 100%. The point is due to P1 and P4 there are several parent abortus (miscarriage) due to male genetic differences. Based on the results of Chi-square analysis ($X^2_{count} > X^2_{\alpha} = 0.05 = 12.63 > 9.49$), indicates that the influence of the male has no significant effect on the birth rate. The point means that research on birth rates is more influenced by environmental and genetic factors, although male influences are few but still play a role in birth. Early embryonic mortality in female cows is often due to inbreeding marriage or marriage of a bitch or a thousand so that the ugly traits of both male and female parent will appear more frequently in its derivatives (Hardjopranojoto, 1995). Embryonic mortality indicates mortality from ovum and fertile embryos to the end of implantation (Hafez, 1993).

The mean birth rate obtained in this study was 86.25%. This birth rate includes a high birth rate when compared to previous Bali cattle-birth studies. Wahyuni (2000) stated that Bali cattle birth rate reached 83.4%. Darmaja (1980) study, which obtains an average birth rate of 81.87% of Bali cattle for first, second and third births in areas with paddy-rice, paddy-rice, and crops planted.

3. Birth Weight of Bali's calf

Birth weight is an essential factor in the growth of cow-calf. Cows with massive birth weight and normal birth will be better able to maintain their life. Based on the analysis of variance, showed that the males had a very significant effect on calf birth weight ($P < 0.01$). As stated by Karnaan & Arifin (2010), which indicates that the birth period shows the impact on calf birth weight (calf) in other words the birth weight between one birth period with another is significantly different.

From Table 2, we can see the mean birth weight of different males namely P1, P2, P3, and P4 are respectively 12.5, 11.92, 14.37, and 14.23 kg. The point shows that an excellent stud or superior will produce good offspring as well. While the average birth weight obtained is 13.06 kg. This figure is higher than the study of Sumbung, Batosama, Ronda, & Garantjang (1978), the results of research conducted from 1975 - 1977 on the campus of Ujung Pandang Hasanuddin University, the average birth weight of cows Bali 12.6 ± 2.6 kg. Sutan (1988) said that some things have a relationship and affect birth weight, among others, the mother nation (female/male), gender of the child, duration of a pregnant mother, age or parity of mother and mother food during conception. Also, the high average birth weight obtained due to improved management and feed.

D. Conclusion

The results of the study concluded that males in semi-intensive care systems strongly influence the parent's conception rate and calf birth weight.

E. References

- Darmadja, S. G. N. D. (1980). *Setengah Abad Peternakan Sapi Tradisional Dalam Ekosistem Pertanian di Bali*. Disertasi, Bandung, Indonesia: Universitas Padjajaran.
- Hafez, E. S. E. (1993). *Reproduction In Farm Animals-6th Ed.* USA: Lea & Febiger Philadelphia.
- Hardjosubroto, W. (1994). *Aplikasi Pemuliabiakan Ternak di Lapangan*. Jakarta, Indonesia: PT. Gramedia Widiasarana Indonesia.
- Jakob, T. N. (1994). *Budidaya Ternak Potong*. Yogyakarta, Indonesia: Kanisius.
- Karnaen & Arifin, J. (2009). Korelasi nilai pemuliaan produksi susu sapi perah berdasarkan testday laktasi1, laktasi2, laktasi3, dengan gabungannya. *J. Anim. Production*. 11, pp. 135-142.
- Pane, I. (1990). Upaya meningkatkan mutu genetic sapi Bali di P3Bali. Pros. Seminar Nasional Sapi Bali 20–22 September, pp. A42.
- Putu, I. G., Situmorang, P., Lubis, P., Chaniago, T. D., Triwulaningsih, E., Sugiarti, T., Mathius, I., W., & Sudaryanto, B. (1998). Pengaruh pemberian pakan konsentrat tambahan selama dua bulan sebelum dan sesudah kelahiran terhadap performan produksi dan Reproduksi Sapi Potong. Pros. Seminar Nasional Peternakan dan Veteriner. Bogor 1–2 December 1998. Puslibang Peternakan, Bogor, pp. 279– 286.
- Salisbury, G. W. & Vandermark, N. L. (1985). *Fisiologi Reproduksi dan Inseminasi Buatan Pada Sapi*. Yogyakarta: Gadjah Mada University Press.
- Sonjaya, H. (2012). Mengkaji program sejuta ekor sapi di provinsi Sulawesi Selatan. Available at <http://saintis-akademis.blogspot.com>.
- Sumbung, F. P., Batosama, J. T., Ronda, B. R., & Garantjang, S. (1978). Performans Reproduksi Sapi Bali. Prosidings Seminar Ruminansia Besar. Direktorat Jenderal Peternakan dan Fakultas Peternakan, Intitut Pertanian Bogor, Bogor.
- Sutan, S. M. (1988). Perbandingan performans reproduksi dan produksi antara sapi Brahman, peranakan Ongole dan Bali di daerah transmigrasi Batu marta, Sumatra selatan. Dissertation. Intitut Pertanian Bogor, Bogor.
- Susilawati, T., Srinto, P., Hermanto, & E. Yuliani. (2003). Inseminasi buatan dengan spermatozoa beku hasil sexing pada sapi untuk mendapatkan anak dengan jenis kelamin sesuai harapan. Laporan Penelitian. Fakultas Peternakan Universitas Brawijaya, Malang.
- Tanari, M. (2001). Usaha pengembangan sapi Bali sebagai ternak local dalam menunjang pemenuhan kebutuhan protein asal hewani di Indonesia. Available at http://rudyc250x.com/sem1_012/m_tanari.
- Wahyuni, D. (2000). *Sapi Bali di Ambang Kepunahan*. Jakarta, Indonesia: Bisnis Indonesia.