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Productivity of Breeding Cows in Integrated Cattle-Oil Palm Plantation Under Different Mating Systems

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ABSTRACT

S.M.Widi, R. G. M. F. Damai, N. Arifiani, E.T. Kristiasancti, and I. Sumantri. Productivity of Breeding Cows in Integrated Cattle-Oil Palm Plantation Under Different Mating Systems.

Integrating cattle breeding stocks with oil palm plantation (OPP) has been widely practiced in Indonesia. To optimizing the productivity of cows under extensive system, breeding management becomes one of success key. Seasonal breeding system allows the cows to calving in the relatively same period and minimizing calf mortality rate. This study was aimed to compare the productivity of the weaning calves under different mating systems, which is seasonal mating (SMS) and non-seasonal mating (NSMS) systems. Data were obtained from oil palm plantation-cattle integrated system in Central Kalimantan (403 Bali x 1792 Brahman cross (BX) in SMS) and (335 Bali x 1858 BX in NSMS). We analyzed the calf crop, calf mortality, weaning weight and cow's productivity between different breeds and mating systems. We observed that calf crop of Bali and BX in SMS were 41.94% and 61.50% while in NSMS were 31.34 % and 41.77%, respectively. Under SMS, calf mortality was 8.65% and 8.40 %; while under NSMS were 20.45% and 12.42% for Bali and BX, respectively. Average weaning weight (WW) of Bali and BX were 131.60 and 177.13kg; and 125.79 and 171.88 kg under SMS and NSMS respectively. Cow productivity index (CPI) of Bali and BX were 55.19 and 108.93 (under SMS) and 39.43 and 71.79 (under NSMS). In their respective breeding system, both breeds of cows performed better under seasonal mating system.

Keywords: Oil palm plantation, cattle breeding, cow's productivity, mating system

INTRODUCTION

Integration of cattle and oil palm plantation has been increasingly adopted in Malaysia and Indonesia (Tohiran et al., 2017). This practice is considered as an effective biological weeds control and establish a harmonious relationship between cattle, the undergrowth, and oil palm (Ayob and Kabul, 2009).

In Indonesia, cattle-oil palm integration system is mainly adopted by cattle breeding farming, whereas large scale breeding companies prefer to choose an extensive farming system (Silalahi et al., 2018). In this production system, breeding performance is significantly affected by

practiced mating system that can be a seasonal mating and a non seasonal mating. The practice of controlled mating (i.e. restricted, seasonal) is defined as the practice where bulls are introduced to the breeding herd for a controlled period of time and then removed from the female herd. This practice is an effective tool in a breeding management systems with many potential benefits, such as the time of calves born and weaning can be uniformed (Bambling, 2018).

Contrary from seasonal mating system, in a non-seasonal mating, bulls are always in the female herd and mating is allowed at any time. In non-seasonal mating, of course birth and weaning can be done at any time, but it will result on a not uniform weaning time. Adopting a defined breeding or calving season is crucial to implement a profitable management practices for beef cattle operations (Benner et. al, 2018). In this study, we compared the productivity of extensive breeding under seasonal mating (SMS) and non-seasonal mating (NSMS) systems of Bali and Brahman Cross cattle through evaluations of calf mortality, calf crop and Cow's productivity index.

MATERIAL AND METHODS

Study was conducted in an integrated cattle-oil palm plantation company (PT. Sulung Ranch) in Central Kalimantan. Data of cow's performances commenced from April 2016 to May 2018 were recorded. From April to December 2016 the OPP company applied NSMS involving 335 heads of Bali and 1858 heads of Brahman cross (BX) cows. Starting from January 2017 to May 2018 the OPP company changed into SMS system involving 403 heads of Bali and 1792 heads of BX cows. Collected data were the number of cows, number of calves born, pre-weaning mortality and the average of weaning weight. In addition, cattle production systems integrated with oil palm were also observed, including mating system, body condition score (BCS) of weaned calf, and the weaning methods.

Data of both systems were analyzed qualitatively and descriptively. Breeding performances were expressed into some parameters i.e.: calf crop, mortality rate, and cow's productivity index (CPI). These parameters were calculated using formulas 1 to 5, as described below:

$$\text{Calving rate (\%)} = \frac{\text{Natality}}{\text{Number of cows}} \times 100\% \quad (1)$$

$$\text{Survival Rate (\%)} = \frac{(\text{Natality} - \text{mortality})}{\text{Natality}} \times 100\% \quad (2)$$

$$\text{Mortality rate (\%)} = 100 - \text{survival rate} \quad (3)$$

$$\text{Calf crop (\%)} = \frac{(\text{Natality} - \text{mortality})}{\text{number of cows}} \times 100\% \quad (4)$$

$$\text{CPI (kg/head/year)} = \text{Calf crop} \times \text{avg weaning weight} \quad (5)$$

RESULTS AND DISCUSSION

Before January 2017, the Oil Palm Plantation (OPP) company was applying Non-seasonal Mating System (NSMS), in which, cows were maintained in flocks and joined with bulls all the time. While starting at January 2017, the company changed the systems into Seasonal Mating System (SMS). Cows were maintained in flocks and joined with bulls only every January – March. In both two systems, one bull served twenty cows. Breeding performances of Bali and Brahman Cross cows under seasonal mating and non-seasonal mating systems is presented in Table 1 and Figure 1.

One of the disadvantages of NSMS was, the calving time could not be predicted and occurred all the time, as the cattle got mating at any time, throughout the year. The weaning period was not uniformed. This condition was difficult to manage and as a result, calf mortality was high for both breeds. Calves born in the dry season were more vulnerable, due to lack of milk production. In traditional extensive breeding, calf mortality can happen in two peaks of time: 1). At the first month after calf is born, calf is not getting sufficient milk so it does not meet the primary requirement for life and the formation of the body's immune. 2). In the early rainy season, many diseases and parasites attack calves (Maulana *et al.*, 2019). Moreover, mortality could be triggered because weak calf should follow their cow's herd, thus calf's energy and protein are wasted for walking and environment stress (Mulik and Jelantik, 2009).

Study of Bamualim and Wirdahayati (2003) showed calf crop of Bali cattle were 64% in extensive system and 72-78% in an intensive system. Our study indicated lower calf crops of Bali cattle raised under oil palm plantation. In Bali cattle, high mortality rate is very related to the availability of forages. Lack of forages and nutrition will result in a cow abandon its calf because of discontinuation of lactation. A rapid re-conception then applied to increase the reproductive rate (McCool, 1992). Therefore, an arrangement of breeding and mating was suggested as well as supplementation of grass and concentrate to avoid mortality before weaning (Jelantik *et al.*, 2010).

After applying SMS, calving time could be predicted and arranged. Within a year, calving period was expected from September–November, where the availability of forages was still abundance to fulfill cow's needs, as forage is a main source of precursor for milk synthesis. Thus, adequate intake and quality of forage will assure colostrum and milk production to maintain calves healthy and growing well. The relatively low mortality rates of both Bali and BX cows under SMS, resulting higher calf crops.

Table 1. Breeding performance of Bali cattle and Brahman Cross cattle with seasonal mating and non-seasonal mating systems

Indicator	BALI		BX	
	SMS	NSMS	SMS	NSMS
Cows (head)	403	335	1792	1858
Number of calves born (head)	185	132	1203	886
Number of calves died (head)	16	27	101	110
Calving rate (%)	45.91	39.40	67.13	47.69
Survival rate (%)	91.35	79.55	91.60	87.58
Mortality rate (%)	8.65	20.45	8.40	12.42
Calf crop (%)	41.94	31.34	61.50	41.77
Average of weaning weight (kg)	131.60±22.13	125.79±22.70	177.13±29.35	171.88±31.96
CPI (kg/head/year)	55.19	39.43	108.93	71.79

In the SMS, bulls only joined with the cows for about 3 months and after mating period, the bulls were mustered in recovery pens, which allowed the bulls to recover their body conditions

until the next mating period. The weaning weight of the Bali and BX calves in SMS were relatively higher than those in NSMS. Seasonal mating system allowed the company practicing better calf management and reduce the mortality pre-weaning and improve the weaning weight. Having improved calf crop and weaning weights, CPI of Bali and BX cows were also improved in SMS, as shown in Figure 2, as CPI is influenced by calf crop and the average of weaning weight. However, calf mortality seemed to become the greatest influence in increasing the calf crop and then CPI.

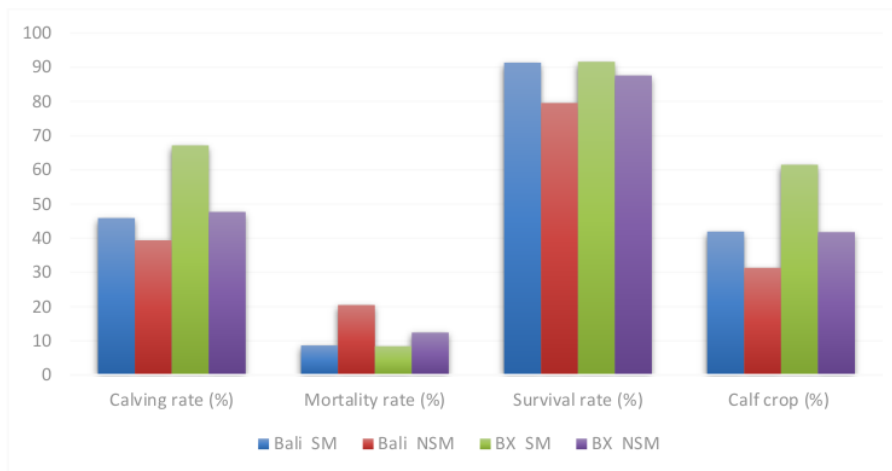


Figure 1. Rate of calving, mortality, survival, and calf crop

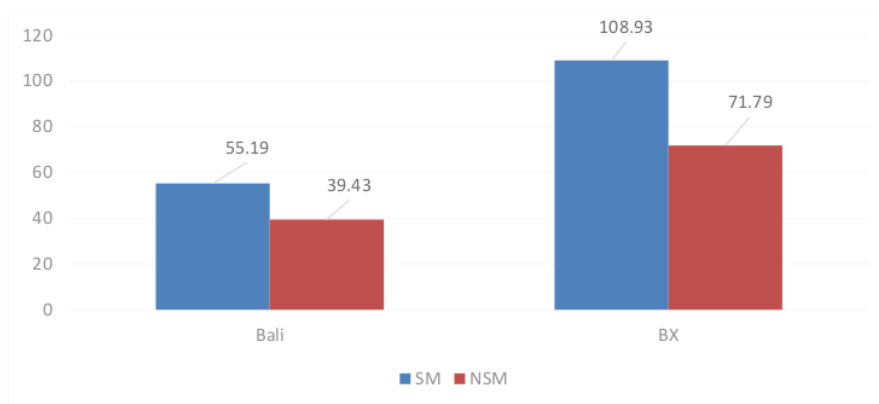


Figure 2. Cow's productivity index (kg/head/year)

CONCLUSION

To conclude our study, by applying seasonal mating system in integrated cattle breeding-oil palm plantation will result better performances of breeding cows due to more systematic management of cattle applied. Supplementation of feed and health treatment during lactation were also suggested to reduce calf mortality and improve calf crop.

REFERENCES

- Arkidius, M. 2018. Analisis tingkat mortalitas sapi Bali pada pemeliharaan tradisional di Kec. Nanaet Dubes, Kab. Belu. *Journal of Animal Science*. 3(3):43-46.
- Ayob, M. A. and M. A. Hj. Kabul. 2009. Cattle integration in oil palm plantation through systematic management. In the Proceeding of the 1st International Seminar on Animal Industry. Faculty of Animal Science, Bogor Agricultural University. Bogor.
- Bambling, A. 2018. Implementing successful controlled mating programs on extensive beef herds. Department of Agriculture and Fisheries. Queensland Government.
- Bamualim, A. and R. B. Wirdahayati. 2003. Nutrition and management strategies to improve bali cattle productivity in nusa tenggara. In *ACIAR Proceedings No. 110: Strategies to Improve Bali Cattle in Eastern Indonesia*. Edited by K. Entwistle and D. R. Lindsay. Australian Centre for International Agricultural Research, Canberra.
- Benner, J., R. R. Grosse., J. Ligon., and L. Siegle. 2018. *Transitioning Beef Cattle to a Defined Breeding and Calving Season*. Virginia Cooperative Extension.
- Jelantik, I. G. N., M. L. Mullik, C. Leo-Penu, and R. copland. 2010. Factors affecting the response of Bali cattle (*bos sondaicus*) calves to supplementation prior to weaning. *Animal Production Science*. 56(6): 493-496. <https://doi.org/10.1071/an09217>
- Maulana, H., Panjono, E. Baliarti, D. T. Widayati, and I. G. S. Budisatria. 2019. Seasonal effect on productivity of Bali cows in oil palm plantation in Riau Province, Indonesia. *IOP Conf. Ser.: Earth Environ. Sci.* 387 012075. doi:10.1088/1755-1315/387/1/012075
- Mccool, C. 1992. Buffalo and Bali cattle--exploiting their reproductive behaviour and physiology. *Tropical animal Health and Production*. 24:165-172
- Mulik, M dan I. G. N. Jelantik. 2009. Strategi peningkatan produktivitas sapi Bali pada sistem pemeliharaan ekstensif di daerah lahan kering: pengalaman Nusa Tenggara Timur. Seminar Nasional Pengembangan Sapi Bali Berkelanjutan dalam Sistem Peternakan Rakyat:1-15. Mataram 28 Oktober 2009: Fapet Universitas Nusa Cendana.
- Silalahi, F. R. L., A. Rauf, C. Hanum, and D. Siahaan. 2018. The characteristic and problems of beef cattle – palm oil integration in Indonesia. *IOP Conf. Series: Earth and Environmental Science* 205: 012016. doi:10.1088/1755-1315/205/1/012016.
- Tohiran, K. A., F. Nobilly, R. Zulkifli, T. Maxwell, R. Moslim, and B. Azhar. 2017. Targeted cattle grazing as an alternative to herbicides for controlling weeds in bird-friendly oil palm plantations. *Agron. Sustain. Dev.* 37: 62. doi.org/10.1007/s13593-017-0471-5

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