EFFECT OF POST-PARTUM ON THE OESTRUS SYNCHRONISATION WITH PROGESTERONE AND OESTRADIOL OF BALI CATTLE

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ABSTRACT

The present study was performed to evaluate the effect of oestrus synchronization during post partum periods. A total of 67 Bali cows were used in the present study, they were raised and fed under field conditions of East Lombok and Mataram. Oestrus synchronization was performed using controlled internal drugs release (CIDR) with oestradiol benzoate capsule (ODB) inserted in the pitch on the stem of CIDR. Then the CIDRs were inserted into vagina of healthy cows for 9 days period. Insemination was performed following oestrus detection. From total 67 cows induced oestrus, 54 cows (80,59%) showed oestrous behavior and 44 cows (65,67%) detected to be pregnant. From a total of 67 cows, 39 cows (58%) were between 0 to 3 months post partum, while the rest 28 cows (42%) were between 3 to 8 months post partum. The cows between 0 to 3 months postpartum exhibited slightly higher percentage of oestrous behavior (82,05%) than that of 3 to 8 months (78,57%). However, 3 to 8 months post partum cows produced slightly higher pregnancy rate (64,10%) than that of 0 to 3 months postpartum (67,85%). Oestrus exhibition and pregnancy results from 1st month to 8th month postpartum were 91,6%, 83,3%, 76,1%, 62,5%, 85,7%, 100%, 60%, 100% and 66,6%, 50%, 66,6%, 62,5%, 85,7%, 66,6%, 60%, 50% respectively. It could be concluded that CIDR and ODB treatment, induced post partum oestrus of Bali cows successfully.

(Key words: Bali cattle, Oestrus induction, Post partum period)

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PENGARUH PERIODE PASCA MELAHIRKAN PADA SINKRONISASI BIRAHI MENGGUNAKAN PROGESTERON DAN ESTRADIOL PADA SAPI BALI

INTISARI

Penelitian ini dilakukan untuk mengetahui effek sinkronisasi birahi pada sapi Bali pasca melahirkan. Sejumlah 67 sapi Bali digunakan dalam penelitian ini, sapi-sapi tersebut dipelihara pada kondisi peternak lokal di Lombok timur dan Mataram. Sinkronisasi dilaksanakan dengan menggunakan *controlled internal drug release* (CIDR) dengan kapsul *oestradiol benzoate* (ODB) dimasukkan dalam celah pada batang CIDR. CIDR dengan ODB dimasukkan dalam vagina selama 9 hari. Inseminasi dilakukan setelah terdeteksi birahi, dari 67 ekor sapi 54 ekor (80,59%) menunjukkan tingkah laku birahi dan 44 sapi (65,67%) terdeteksi bunting. Dari 67 ekor sapi yang digunakan, 39 ekor (58%) berada 0 - 3 bulan pasca melahirkan, sedang 28 ekor sisanya (42%) berada 3 sampai 8 bulan pasca melahirkan. Sapi-sapi yang berada antara 0 sampai 3 bulan pasca melahirkan menghasilkan persentase tingkah laku birahi (82,05%) lebih tinggi dari yang berada 3 sampai 8 bulan pasca melahirkan (78,57%). Sapi-sapi pada 3 sampai 8 bulan pasca melahirkan menghasilkan kebuntingan (64,10%) sedikit lebih rendah dari 0 sampai 3 bulan pasca melahirkan (67,85%). Evaluasi data bulanan menunjukkan bahwa tingkah laku birahi dan tingkat kebuntingan yang dihasilkan dari bulan pertama hingga bulan ke delapan pasca melahirkan adalah 91,6%, 83,3%, 76,1%, 62,5%, 85,7%, 100%, 60%, 100% dan 66,6%, 50%, 66,6%, 62,5%, 85,7%, 66,6%, 60%, 50% berturut-turut. Akhirnya dapat disimpulkan bahwa CIDR dan ODB dapat menginduksi birahi dan dapat menghasilkan kebuntingan pada sapi Bali.

(Kata kunci: Sapi Bali, Induksi birahi, Periode post partum).

Introduction

Bali cattle had been exported to Hongkong, Singapore from Nusa Tenggara Barat (NTB) in the year of 1970 to 1980. In 1990 beef cattle production from NTB only supply inter-island needs, mainly were transferred to Java. In the end of year 2000, unfortunately there was no inter-island transportation of Bali cattle from NTB. As the population of Bali cattle decreased, the price of cattle increased, consequently, the retailer could not get profit and the inter-island trade stopped. As populations decreased, efforts have been done to improve Bali cattle productivity by introducing artificial insemination (Muladno, 1998; Dradjat *et al.*, 1998) and feeding improvement as well as better management (Dradjat *et al.*, 1997; Oka, 2000; Mastika, 2000). As a management technique to improve cattle productivity CIDR (controlled internal drug release) and ODB (oestradiol benzoate) has been developed and available commercially. By employing these regimes cattle could be induced to show oestrous behavior in a predetermined time and hopefully maximum pregnancy rates could be achieved by insemination. By adopting this synchronization technique pregnancy could be arranged, birth date could be predicted with uniformity of calf born. This technology facilitates management, however there are many factors which may influence to reach maximum productivity (Entwistle dan Oga, 1978; Campbell, 1979) one of those factors is post-partum period. During early post partum periods cows are in anoestrus conditions with no ovarian activities and therefore there was no information of influence of progesterone treatment to synchronize oestrus during post partum period of Bali cattle.

The present study was performed to evaluate the effect of CIDR combined with

ODB no induce oestrus during post partum periods of Bali cattle.

Materials and Methods

A total of 67 Bali cows were used in the present study, they were raised and fed under field condition of East Lombok and Mataram. Postpartum periods were classified monthly from the 1st month to the 8th month. The information of post partum periods were obtained from the farmers and confirmed with estimation of calves age. Oestrus synchronization was performed using controlled internal drug release (CIDR type B, Eazi-breed CIDR device contains of 1,9 g progesterone, Genetics Australia PO Box 195, Bacchus Marsh, Victoria 3340) with oestradiol benzoate capsule (ODB capsule, contains of 10 mg Oestradiol benzoate, Genetics Australia POBox 195, Bacchus Marsh, Victoria 3340) inserted in the pitch on the CIDRs stem (Xu and Burton, 1995; 1996). Then the CIDRs were inserted intra vaginally to the healthy cows for 9 days period (Dradjat, 1990). Oestrus detection was performed for 5 consecutive days beginning at the second day until the seventh day following CIDR removal. In order to avoid mis-detection, oestrus detection was performed until late night and early in the morning, with observation completed every 6 hours and each observation was lasted for 0,5 hour (Sawyer *et al.*, 1986).

Insemination was performed by carrying liquid nitrogen tank to insemination areas. Following thawing frozen semen by standard technique, artificial insemination was applied (Dradjat *et al.*, 1998). The cows which showed oestrous behavior in the morning inseminated in the evening while the cows which showed oestrous behavior in the evening inseminated in the following morning. Pregnancy diagnosis was done by rectal palpation 60 to 90 days following insemination (Entwistle, 1984). Data obtained were analyzed using percentage of oestrous behavior and pregnancy as a total cows used. Then evaluation of 0 to 3 months and 3 to 8 months post partum, and evaluation was also completed by monthly post partum.

Results and Discussion

It was clearly understood that optimum reproductive performance can be achieved by reaching one year calving interval, as pregnancy terminated by 9 months (285 days), consequently only 85 days left to undertaking effort to get pregnancy (Cummins, 1984). It was reported during 85 days post partum the first 40 days were used for uterine involution, however post partum anoestrus interval in several genotype cattle was found between 74 to 104 days (Cummins, 1984). By implementing oestrus synchronization, oestrus and ovulation can be predicted in predetermined time, oestrus detection and insemination could be planned in a certain time (Smith and Macmillan, 1978).

The results of the present study indicated that from 67 cows induced oestrus, 54 cows (80,59%) showed oestrous behavior and 44 cows (65,67%) diagnosed pregnant by rectal examination 60 to 90 days after insemination (Figure 1). This results in line to the results of Drew, (1978) who reported that oestrus synchronization produced pregnancy rate of 60% (Drew, 1978).

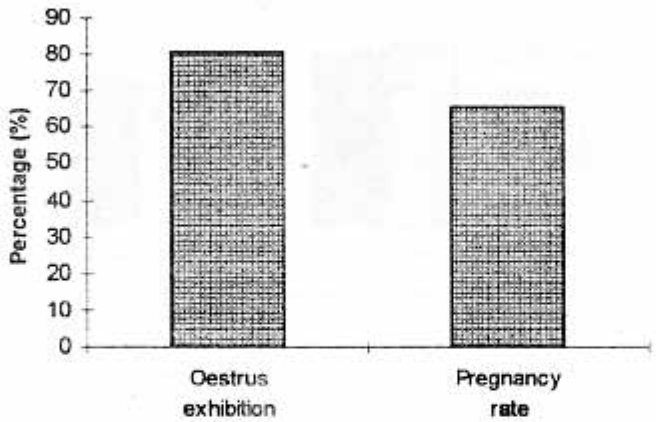

Figure 1. The overall oestrus exhibition and pregnancy rate following CIDR with oestradiol benzoate treatments for oestrus synchronization.

Without oestrus synchronization, oestrus detection would be a main problem for farmers in the developed and developing countries (Sawyer *et al.*, 1986; Hurnik dan King, 1987). This problem arise as cattle are non seasonal polyoestrus animal and may shows oestrous behavior at any time of the year. Consequently, oestrus detection would be year round jobs, laborious and subjected to human error (Sawyer *et al.*, 1986). A successful oestrus synchronization would lead to predetermined time for insemination. It was speculated that progesterone can be used to medicate anoertrus conditions. Generally during post partum period, most cows under anoestrus conditions which has no ovarian activities (Salisbury *et al.*, 1978) It does not show follicles growth nor corpora lutea development, consequently under anoestrus conditions there is no progesterone or oestrogen in blood circulation (Salisbury *et al.*, 1978). To reach optimum production the cows should be pregnant by less than 3 months post partum. From a total of 67 cows in the present study, 39 cows (58%) were categorized as between 0 to 3 months post partum, while the rest 28 cows (42%) were in 3 to 8 months post partum. Following oestrus synchronization, oestrus behavior, insemination and pregnancy were presented in Figure 2. It can be seen that 0 to 3 months postpartum cows shows slightly higher percentage of oestrous behavior (82,05%) than that of 3 to 8 months (78,57%). However, 3 to 8 months post partum produced slightly higher pregnancy rate (64,105%) than that 0 to 3 months postpartum (67,85%). These results indicated that progesterone successfully mimics luteal phase of oestrus cycle during early post partum and following device removal progesterone decreased successfully. This resulted in inducing oestrous behavior, ovulation and pregnancy following insemination. Post partum anoestrus in beef cows was detected in severals genotype cattle varied from 74 to 104 days (Cummins, 1984). It was reported in anoestrus cows, 90% of them could be stimulated to induce oestrus using progesterone with oestradiol benzoate and suitable for insemination (Macmillan *et al.*, 1994). Hence, CIDR and oestradiol benzoate was successfully induced oestrus during post partum of Bali cattle.

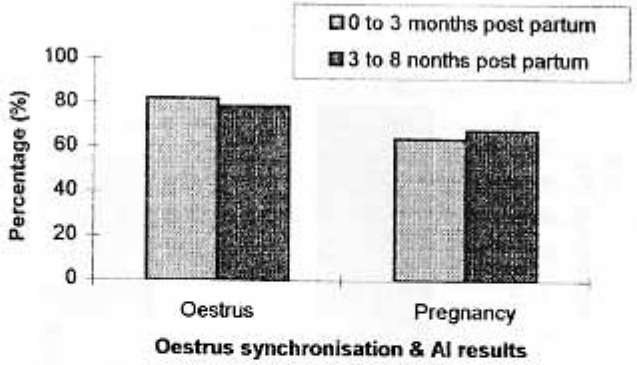

Figure 2. Percentage of oestrous behavior and pregnancy result following oestrus synchronization and insemination in 0 to 3 and 3 to 8 months post partum.

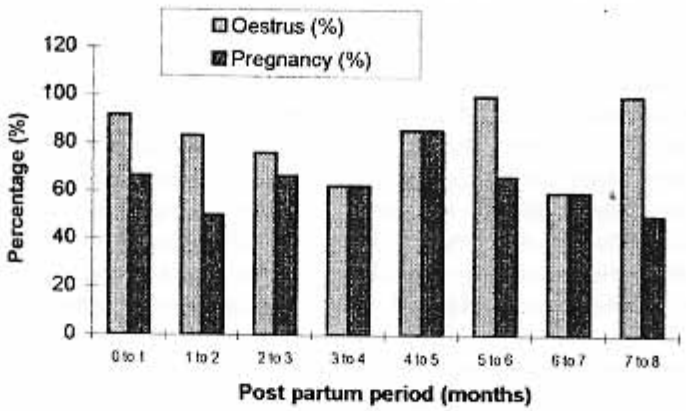

Figure 3. Percentage of oestrus and pregnancy following CIDR with Oestradiol benzoate treatments to synchronized oestrus.

The results of the present study was also strongly supported by monthly classification of post partum, indicated that oestrus exhibition varied from 60% to 100% while pregnancy rates varied from 50% to 85,7%. These results (Figure 3) showed higher oestrus exhibition with lower pregnancy rate such as postpartum periods 1st month, 2nd month, 3rd month, 4th month, 5th month, 6th month, 7th month, 8th month postpartum were 91,6%, 83,3%, 76,1%, 62,5%, 85,7%, 100%, 60%, 100% and 66,6%, 50%, 66,6%, 62,5%, 85,7%, 66,6%, 60%, 50% respectively. Slightly lower pregnancy rate compared to oestrus exhibition of the early post-partum period indicated that the cows might have not ready yet for pregnancy as the energy intake not only for providing milk for their calves but also need for involution of uterus (Putra dan Sukarini, 1998), the other possibility was that physiologically the ovaries had not yet ready to produce mature oocytes or the uterine horn

had not ready to accept conceptus during pregnancy. The mechanism which progesterone combined with oestrogen successfully induced oestrus during post partum period can be explained that, basically, ovarian activity can be stimulated. It was reported that small size of follicles grows at any time during the cycle and these grease was reported in wave like pattern (Ginther *et al.*, 1989). This pattern was repeated in every 8 to 12 days (Ginther *et al.*, 1989) and was also detected from 10 days postpartum or during anoestrus periods (Mc Dougal *et al.*, 1995).

It was reported that new follicle wave emerged from 4 to 5 days after oestrogen treatment (Bo *et al.*, 1995). Follicular development wave developed to be estrogenically active, this activity initiated luteolityc sequence (Thatcher *et al.*, 1989), the luteolytic showed by decreasing of progesterone, where the decrease of progesterone induced negative feed back to LH (Luteinizing hormone). Dominant follicles developed as graffian follicle when the LH enough to stimulate increase of oestradiol. When oestradiol concentration increased and reached certain levels it influenced hypothalamus and consequently the cows showed oestrous behavior. Following ovulation after oestrous synchronization and artificial insemination performed following oestrus detection produced successful pregnancy rates. Hence, progesterone and oestradiol benzoate treatment successfully not only to induce oestrus and ovulation but also could be used to prescribe anoestrus condition.

Conclusion

From the results of the present study, it can be concluded that oestrus in Bali cows could be induced as early as less than one months post partum. Pregnancy rates achieved using oestrus synchronization from first month up to 8 months post partum were varied as much as 50% to 85%. Progesterone treatment combined with oestradiol benzoate to synchronize oestrus can be used to shortened calving interval. It was suggested that further study need to be performed to study the effect oestrus synchronization during post partum anoestrus in Bali cattle evaluated by using progesterone assay.

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