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THE EFFECTS OF ESTROUS SYNCHRONIZATIONS BY USING PGF2α ON THE CONCEPTION RATE ON BRAHMAN CROSS COW

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Abstract – The objective of this study is to determine the effect of injecting prostaglandin F2 alpha (PGF2α) on the duration of estrous appearance and the success of AI on Brahman cross cow (BX). The material used in the study was 40 Brahman Cross (BX) female cows with PGF2α treatment and 40 female BX cows without injection of PGF2α as a control. The materials in this study were synthetic hormone PGF2α with Lutalyse brand with a dose of 5 mL on a single dose injecting method. The observation results showed the appearance of oestrus sign after PGF2α injection most rapidly occurred at the 27th hour and the slowest appearance occurred at the hour 69th. The average appearance of signs estrous after PGF2α injection most occur at the 30thhour with the number of 21 head Livestock 52.50% of the population. The results of this study showed that from 40 cows with injection of PGF2α as many as 21 heads (53%) Non Return Rate, whereas from 40 cows without injection of PGF2α there were 25 head (63%) of cattle that non return Rate 1.However after 3 monthsexamination of pregnant using rectal palpation, showed that cows who injected PGF2α with 3 head (7.5%) are pregnant, whereas cattle without injection PGF2α only 5 head α (12.5%) are pregnant.

INTRODUCTION

Artificial Insemination (AI) is one of the technologies in the reproduction of livestock that has benefits in accelerating the genetic improvement of livestock, preventing the spread of reproductive diseases caused by natural mating, increasing the efficiency of the use of elite bulls (Ax *et al.*, 2008). One of the success factors of AI Implementation is the skill and knowledge of breeders on early detection of estrous as the basis for determining the timing of the proper implementation of AI by inseminator (Susilawati, 2011a).

In order to increase the population of beef cattle, some industries and beef cattle breeders used the Brahman Cross (BX) imported from Australia for breeding. The problems that occur in breeding BX cattle are the number of incidents of silent heat in Brahman Cross cows that cause breeders and inseminators is difficult to detect the period of estrous and determine the timing of the implementation of AI properly. Therefore, one of the solutions to increase the AI success is by synchronizing oestrus with PGF α2 injections.

METHODOLOGY

The material used was 80 Brahman Cross cows . age between 1 - 2 years, normal reproductive organs. which 40 head without injection of PGF2α as a control treatment (T0) and 40 head were treated with PGF2α injections (P1). PGF2α synthetic hormone with Lutalyse brand product from Zeotis with dose of 5 mL was applied in single dose injection method. unknown stage estrus cycle. Observation of the occurrence of signs of oestrus was done every 4 hours after the day of injection of PGF2α. Observation of estrous was done visually. after the 19-21 days, observed the signs of estrus. If it does not show signs of estrus considered pregnant.

Indicators of occurrence of signs of estrous used in observations were the red, swollen, warm, vulva and the cows were willing to climbing or climbed up (Susilawati, 2011[a]). The success of AI was evaluated by using Conception Rate (CR) based on Non-Return Rate (NRR) that was not showing the appearance of estrous in the next cycle or day 19-22, to ensure pregnancy by using rectal palpation after

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3 months (Susilawati, 2013).

RESULTS AND DISCUSSIONS

Based on the results of this study showed that cows injected with PGF2α managed to synchronize the estrus, although the quality is different. this indicates at the time of injection all in the period diestrus. Islam (2011) A single injection of prostaglandin is given to cyclic females, and then these females are bred as they express estrus. The disadvantage of this program is that one-third of the females do not respond to the injection. this is in accordance as opined by Hafeez and Hafeez (2008). that PGF2α can cause the lysis of the corpus luteum present in the phase in estrus. Differences in the quality of estrus appearing indicated due to the difference in the ability of secretion hormones estrus maximally from each individual. Tsiliganni, *et al.*, (2011) cervical mucus is produced by secretion cells present in the endocervix. the quality and quantity of cervical mucus is strongly influenced by the hormone estrogen that is secreted during estrus.

Brahman Cross cows often show no signs of estrus caused by heat stress, less feed and are not resistant to ectoparasites and endoparasites Putro *et al.*, (2008).

The appearance of signs of estrous after injection of PGF2α most rapidly occurred at the 27th hour and the slowest occurred at the hour to 70. The average appearance of signs estrous after PGF2α injection most occurred at the 30th hour with the number of 21 head of cattle at 52, 50% of all population. Conception rate (CR) data between cows with PGF2α injections and cows without injection of PGF2α were not significantly different after being analyzed with Chi-square. The Differences in the appearance of estrous is indicated due to the difference in the ability of the secretion of hormones maximally from each individual. The higher of hormone estrogen produced, the higher the quality of estrous will appear. Tsiliganni *et al.*, (2011) mentioned that cervical mucus produced by secretion cells present in the endocervix, the quality and quantity of cervical mucus is strongly influenced by hormonal conditions that are secreted at the time of estrus. Kune and Najamudin (2002) also described the differences in the quality of estrous in cows can be caused by individual factors associated with hormonal conditions, especially the condition of the hormone estrogen in stimulating activity estrous. The research from Bernardi *et al* (2015) support thatthe amount of progesterone hormone in serum when the emergence of cervical mucus is 0.17 ng / mL - 0.44 ng / mL while the amount of estrogen hormone is 30.95 pg / mL - 54.77 pg / mL, can be interpreted that when the emergence of mucus cervix is the occurrence of the follicular phase in the estrous cycle.

Table 1. Estrus Quality in Cow after PGF2á Injections

	number of cows (Head) (%)	Mucus Quality)
T0 (Control)	13 (37.5%)	-
	15 (37.5%)	+
	10 (25%)	++
T1 (PGF2 á Injection)	36 (90%)	+
	4 (10%)	++

Note :
- NoMucus
+ Few Mucus
++ Much Mucus

No signs of oestrus considered as successful pregnant. This is because PGF2α hormone only plays a role in regenerating the Corpus Luteum to shorten the cycle of estrous and restore the cycle of estrous in the follicular phase. The success of AI can be influenced by several factors such as inseminator skills in determining time and implementing AI procedures, animal physiology, semen quality and environmental factors. Susilawati (2013) explains that inseminator skills in observing signs of estrous, frozen semen handling, thawing, and the ability to implement AI will determine the success of AI. Susilawati (2011^{b}) also described that the position of semen deposition during AI affects the success rate of AI, the position of 4+ semen deposition has a higher reproduction efficiency than the position of semen deposition on 4.

The PGF2α used in synchronization activity works as a regression of corpus luteum (CL). CL

Table 2. Conception Rate base on Non Return Rate I and Rectal Palpation of Cow with PGF2α injection

Treatment	Non Return Rate I	Rectal Palpation 3 (Mount)
PGF2α injection	21 Heads (53%)	3 head (7,5%)
Not PGF2α injection	25 Heads (63%)	5 Head (12,3 %)

regression accompanied by a decrease in the amount of the hormone progesterone will respond to the hypothalamus which will stimulate the process of secreting estruos hormones that is Gn-RH, FSH, estrogen, and LH. The esterogenic hormones that appear in the female reproductive organs are very influential on the appearance of signs of estrous as the physical changes of the vulva become swollen, red, warm and has a mucus. The appearance of signs of estrous in cows greatly affects the success rate of AI. Synchronization of oestrus can be accomplished with the injection of prostaglandin F2α alone, but it needs proper detection of the ovarian status of the cows as prostaglandin F2α is active in only functional corpus luteum in between 8 to 17 days of estrous cycle (Islam, 2011)

After 3 months, examination of pregnant using rectalpalpation, results show cows injected with PGF2α were 3 (1.3%) pregnant, while the cows without injection of PGF2α is pregnant 5 (12.5%) head. Reduced Data successful pregnancy by rectal palpation, indicating the presence of silent heat or early embryonic mortality. In accordance with opinions of Jainudeen and Hafez (2008) Absence of signs estrus can be caused by a variety, among other things Failure of the ovaries to develop or Persistence of the Corpus Luteum, it is also caused by the death of the embryo (Pyometra/ mummification). This is due to the inability of the corpus luteum in maintaining pregnancy or sistic ovary, caused by deficiency LH and/or GnRH atau Nympomania (sistic ovary).

CONCLUSION

The quality of estrous on cows with injection PGF2α showed estrous character with thin mucus as much as 36 cows from 40 head of cows.

Non Return Rate I and conception rate of cows with PGF2α injections is as 21 heads (53%) and 3 head (7.5%) are pregnant, whereas cattle without injection PGF2α as 21 heads (53%) Non Return Rate only 5 head (12.5%) are pregnant, whereas from 40 cows without injection of PGF2α there were 25 head (63%).

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REFERENCES

Ax, R.L., Dally, M.R., Didion, B.A., Lenz, R.W., Love, C.C., Varner, D.D., Hafez, B. and Bellin, M.E. 2008. *Artificial Insemination*. In *Farm Animal Reproduction.* ed. by. Hafez, E.S.E and B. Hafez. Balckwell Publishing: 376: 389.

Bernardi, S., Rinaudo, A. and Marini, P. 2015. Cervical Mucus Characteristics and Hormonal Status at Insemination of Holstein Cows. *Iranian Journal of Veterinary Reserach*. 17 (1) : 45-49.

Hafez, E.S.E. and Hafez, B. 2008. *Reproductive Cycles in Farm Animal Reproduction.* ed. by. Hafez, E.S.E. and B. Hafez. Balckwell Publishing : 55 – 67

Islam, R. 2011. Synchronization of Estrus in Cattle: A Review. *Veterinary World*. 4(3) : 136-141

Kune, P. Dan Najamudin. 2002. Estrus Beef Response Caused by Progesterone, Prostaglandin PGF2á and Estradiol Benzoate in Estrus Synchronization Activity (Indonesian Version). *Jurnal Agroland*. 9(4): 380 – 384.

Putro, P.P., Wasito, R., Wuryastuty, H. dan S. Indarjulianto, 2008. Dynamics of Follicle Progression and Progesterone Plasma Profile During Cycle Estrus on Brahman Cross Cow. *Jurnal Animal Reproduction* 10 (2) : 73-77 (Indonesia Version)

Susilawati, T. 2013. Guidelines for Artificial Insemination in Livestock (Indonesian Version). UB Press ISBN 978-62-203-458-2

Susilawati, T. 2011[a]. Spermatology (Indonesia Version). UB Press ISBN : 978–602-8960-04-5

Susilawati, T. 2011[b]. Success Rate of Artificial Insemination with Different Quality and Cement Deposition in Ongole Peranakan Cattle (Indonesia version). *Jurnal Ternak Tropika.* 12(2): 15 – 24.

Tsiliganni, T., Amiridis, G.S., Dovolou, E., Menegatos, L., Chadio, S., Rizos, D. and dan A.G. Adan. 2011. Association Between Physical Properties of Cervical Mucus and Ovulation Rate in Superovulated Cows. *Canadian Journal of Veterinary Research*. 75: 248 – 253.