

NOTES: VERIFICATION OF FARMERS' PERCEPTION OF THE OCCURRENCE OF ESTRUS (HEAT) IN CARABAOS DURING THE FULL PHASE OF THE MOON

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ABSTRACT

Bimonthly visits were made to different barangays of Baybay, Albura and Inopacan, Leyte. Caracows which were naturally in heat were inseminated while the others were artificially induced using prostaglandin $F_2\alpha$ and subsequently inseminated. It was observed that during the full phase of the moon, 85.90% of the caracows were naturally in heat while all (100%) of the artificially induced animals came into heat after injection with the hormone.

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The Philippine carabao, notwithstanding the evidence of its economic importance in Philippine farming (Quintana, 1960; Rigor, 1967; Araral, 1981; and Pascual, 1984), has not received much attention as regards its productive and reproductive improvement. This is supported by research results in the past two decades which show the steady decline of the carabao's body size (Advisory Committee on Technology Innovation, 1981). A number of inadequate management practices, including breeding, feeding and disease control measures, have been implicated as the cause (Eusebio, 1985).

Of all the manipulative techniques in reproductive physiology, artificial insemination (AI) has been the most successful and most widely accepted (Enwistle, 1990). In addition to the many other advantages derived from its use, particularly in carabaos, AI is also a means to improve the performance and genetic make-up of the animal. The application of this technology per se is not practical if one speaks of the smallhold farmers in dispersed areas in the barangays as clientele. On this premise, to increase the effectiveness of AI while decreasing its cost, estrus synchronization (ES) is adopted.

The most widely used method of synchronization in carabaos as well as in buffalos, is through hormonal treatment. This method utilizes the ability of prostaglandin to break down existing corpora lutea (CL). When injected into animals with active CL, it induces regression of these susceptible CL and a new cycle will recommence in all treated animals. However, the method is less successful when the hormone is injected into animals whose CL are not susceptible to the luteolytic action of prostaglandin (<7 days old). To overcome this, the two-dose technique is employed. After the first dose of prostaglandin, those with young CL will remain unaffected and those with old CL will lose them and recommence cycling. A second injection of prostaglandin is given 11 days later when all the animals have a CL of susceptible age (Enwistle, 1990).

The moon is one of the heavenly bodies closest to the earth that reflects sufficient sunlight at its full phase to light up the night satisfactorily. The list of influences of the moon on the Earth as cited by Whipple (1970), does not include the matter on estrus induction in carabaos. But it is noteworthy to mention that Nalbandov (1976), Cole and Cupps (1977), and Crighton *et al.* (1978), reported that moonlight stimulates hormones that induce heat in carabaos.

This paper does not attempt to credit the moon as the cause of estrus in carabaos. However, since the influence on estrus in carabaos is an interesting subject for scientific investigation, it investigates the validity of farmers' perception of caracows naturally coming into heat during the full phase of the moon as an alternative to hormonal means of ES.

Bimonthly visits to the different barangays of Baybay, Albura and Inopacan, Leyte were made once within the full phase and another at either of the other three phases of the moon. This activity was done to determine whether or not caracows were naturally in heat during the full phase period and on the other phases as well. Those caracows which were naturally in heat during visitation were inseminated while those that were not, were given the first dose of the prostaglandin hormone. Data were gathered for nine consecutive months (April to December, 1991).

The prevalent criticism given to ES in carabaos is that oftentimes it is inadequate to induce ovulation (Enwistle, 1990). This partly explains the rather low conception rate achieved through AI which adopts ES as a tool (Table 1).

From the seminars conducted by the staff of the Carabao Action Program (CAP) of ViSCA with farmer-cooperators in the various barangays of Baybay, Leyte, it was learned that carabaos were influenced by the moon

Table 1. Number of caracalves produced from 1991-1993.

Number of Caracows Inseminated	Number of Calves Produced	Heat Classification	Success rate (%)
120	39	Heat induced	32.50
135	66	Natural heat	48.89

Table 2. Number of animals in heat during the full phase of the moon, April-December, 1991.

Month	Barangay Covered	Number of Animals Naturally in Heat	Total Number Palpated	(%)
April	ViSCA	3	4	75.0
May	Maybog	9	11	81.8
June	Pangasugan	4	4	100.0
July	Hibunawan	7	8	87.5
August	Pomponan	8	10	80.0
September	Hipusngo	6	7	85.7
October	Biasong	6	7	85.7
November	Palhi	11	12	91.7
December	Albuera	13	15	86.7
Total Average		67	78	85.90

Table 3. Number of animals in heat during the other phases of the moon, April-December, 1991 (second visit).

Month	Barangay Covered	Number of Animals Artificially in Heat	Total Number Palpated	(%)
April	ViSCA	5	5	100
May	Maybog	15	15	100
June	Pangasugan	10	10	100
July	Hibunawan	14	14	100
August	Pomponan	15	15	100
September	Hipusngo	13	13	100
October	Biasong	14	14	100
November	Palhi	9	9	100
December	Albuera	12	12	100
Total Average		107	107	100

particularly during its full phase period. This influence was expressed in carabaos by inducing them into heat. This belief of farmers instigated the CAP staff to undertake this study. The data gathered show that 85.90% of the total number of carabaos presented for artificial insemination were in heat during the full phase of the moon compared to the artificial induction which was 100% (Tables 2-3).

The ability of the moon to induce carabaos into heat is subject to the laws of physics and dynamics. The moon is so close to the earth that it reflects sufficient sunlight at its full phase (Whipple, 1970). During the other phases of the moon, except on the new moon, the moon still reflects the sun's light on the earth but not as much as it does during its full phase. This explains the concurrence of heat in carabaos with the full moon phase.

During the full phase of the moon, the intensity of sunlight reflected on the earth including on carabaos, stimulates the hypothalamic leutanizing hormone (LH) regulating region to cause the pituitary gland to produce sufficient levels of LH into the bloodstream and induce heat. This phenomenon is possible as Nalbandov (1976), Cole and Cupps (1977) and Crighton *et al.* (1978) cite the existence of a direct retinohypothalamic pathway, a mechanism by which gonadotropin secretion in female mammals and birds is controlled, although they suggest that another way via the accessory optic tracts is also possible. Accordingly, the eyes are the major receptors of light particularly in mammals.

Light per se, cannot always induce animals into heat. For instance, light directly from the sun which is apparently of greater intensity than its mere reflection, has not been observed to positively affect the female animal's reproductive cycle. The studies of Hill *et al.* (1970), Plasse *et al.* (1970), and Ingraham *et al.* (1974) have shown that the estrus behavior of livestock can be affected by various extrinsic factors including climatic conditions. The study of Jainudeen (1977) implicates the high ambient temperature in the tropics as the cause of the reduction of the sexual activity in the daytime. In addition, the same author says that the hot environment results in a nocturnal trend of estrus manifestation.

The findings of this study are based solely on the percent of caracows coming into heat during the full moon. The samples do not warrant statistical analysis but this information can be exploited by all those engaged in carabao improvement through AI. The apparent economic implication to the livestock industry spared of the expense of the hormones-used in ES, cannot be overemphasized considering that the sustainability of projects like the CAP in ViSCA is not certain because of the tremendous expense of synchronizing hormones.

In order to get the effect of the amount of light (full moon, or other phases of the moon), it is recommended that a certain number of caracows be monitored for one year without inseminating them so that this effect could be analyzed statistically. Actually, however, this is difficult since farmers raise caracows either for calf production or draft purposes.

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