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**S Dash**

Department of Animal  
Reproduction, Gynecology and  
Obstetrics, C.V.Sc. & A.H.,  
O.U.A.T., Bhubaneswar, Odisha,  
India

**PC Mishra**

Department of Animal  
Reproduction, Gynecology and  
Obstetrics, C.V.Sc. & A.H.,  
O.U.A.T., Bhubaneswar, Odisha,  
India

**SM Nanda**

Department of Veterinary and  
Animal Husbandry Extension,  
C.V.Sc. & A.H., O.U.A.T.,  
Bhubaneswar, Odisha, India

**KC Tudu**

ICAR- National Dairy Research  
Institute, Karnal, Haryana,  
India

**B Satapathy**

Department of Animal Breeding  
and Genetics, C.V.Sc. & A.H.,  
O.U.A.T., Bhubaneswar, Odisha,  
India

**S Kanungo**

Department of Livestock  
Production and Management,  
C.V.Sc. & A.H., O.U.A.T.,  
Bhubaneswar, Odisha, India

**Corresponding Author:**

**S Dash**

Department of Animal  
Reproduction, Gynecology and  
Obstetrics, C.V.Sc. & A.H.,  
O.U.A.T., Bhubaneswar, Odisha,  
India

## Effect of double synch and estra-double synch protocols on estrous characteristics and conception rate of post partum anestrous buffaloes

**S Dash, PC Mishra, SM Nanda, KC Tudu, B Satapathy and S Kanungo**

### Abstract

Fifty Indigenous and graded buffaloes between 1<sup>st</sup> and 4<sup>th</sup> parity showing postpartum ovarian acyclicity for 120 days or more, were selected for the study. The true anestrous animals were treated with two different hormonal protocols *viz.* Double synch (Group A, n=20) and Estra-double synch (Group B, n=20) protocols along with routine vitamin and mineral supplements and Group C (n=10) as control group with only routine vitamin and mineral supplements for 2 weeks. Buffaloes induced by double synch therapy (group I) yielded 70 per cent oestrus response, induction interval (hour) was  $69.63 \pm 1.86$ , duration of estrus (hour) was  $16.31 \pm 1.56$  and conception rate was found to be 57.74 per cent. The buffaloes which were subjected to estra-double synch protocol (group II) recorded estrus response in 80 per cent (16) cases with corresponding induction interval of  $62.67 \pm 1.74$  hour, duration of estrus was  $18.13 \pm 1.28$  hours and the conception rate was 62. 50 %. Lowest oestrus response of 20 per cent was observed in untreated, where the average induction interval was  $260.40 \pm 3.46$  hrs and of duration of estrus was  $11.25 \pm 2.25$  hour with 50 per cent conception rate. From the above light of study it may be concluded that double synch and estra double synch protocols are worthy, successful and valuable for induction of estrus in post partum anestrous buffaloes.

**Keywords:** Buffaloes, fifty Indigenous, hormonal protocols

### Introduction

Postpartum anovulatoryacyclicity is considered as a normal phenomenon in cows and buffaloes. However, unusual prolongation of normal postpartum period is regarded as pathological and could incur substantial economic loss, communisurating with the period of anestrousy. The management in buffaloes is still more difficult due to phenomena like seasonal anestrus and silent estrus. Hence timely resumption of estrous cycle, following parturition is imperative for healthy continuation of reproduction and production. Initiation of estrous cycle is mostly a phenomenon which is mediated hormonally in normal cows and buffaloes with timely intervention of hypothalamus - pituitary - ovarian events. However, energy deficiency, uterine pathology and suckling might cause aberration of endocrine function causing suppression of postpartum estrus. It is desirable that cows and buffaloes should conceive within 90 days post partum. If they do not come to cycle within 120 days postpartum, they are considered as anestrus. Commonly various hormonal therapies are targeted against postpartum anestrus, basing on their action mimicking endocrine events associated in the postpartum period.

### Materials and methods

The present study was carried out in the Department of Animal Reproduction, Gynaecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Odisha University of Agriculture and Technology, Bhubaneswar in collaboration with AICRP (Animal Nutrition) project in some villages of Niali block of Cuttack district.

### Source of animal

Indigenous and graded buffaloes between 1<sup>st</sup> and 4<sup>th</sup> parity showing postpartum ovarian acyclicity beyond 120 days were selected for the study.

### Experimental Design

Group A (n=20) Postpartum anestrous buffaloes treated with double synch protocol with routine vitamin and mineral supplements for 2 weeks.

Group B (n=20) Postpartum anestrous buffaloes treated with estra-double synch protocol with routine vitamin and mineral supplements for 2 weeks.

Group C (n=10) Post partum anestrous buffaloes kept as control and were provided with routine vitamine and mineral supplements for 2 weeks.

### Double-synch protocol

The animals in this group were injected with Cloprostenol\* 500 mcg i/m on the day of examination (0 day). Inj. of Buserelin acetate\*\* 10 mcg was advocated by i/m route after 48 hr i.e. on Day 2. Injection of cloprostenol\* 500 mcg i/m was repeated after a week (Day 9). Similarly Buserelin acetate\*\* 10 mcg was repeated after two days i.e. Day 11.

### Estra-double synch Protocol

The animals in this group were injected with Cloprostenol\* 500 mcg i/m on the day of examination (0 day). Inj. of Buserelin acetate\*\* 10 mcg was advocated by i/m route after 48 hr i.e. on Day 2. Injection of cloprostenol\* 500 mcg i/m was repeated after a week (Day 9). Inj. of Estradial Benzoate\*\*\* 2 mg was administered on the following day (Day-10).

Following the treatment of the experimental animals, the estrous characteristics like estrous induction, induction interval, duration of estrous, and grading of estrous were evaluated accordingly. Animals with standing estrous signs were inseminated with with good quality frozen semen supplied by ARD Dept. Pregnancy diagnosis was conducted 60-90 days post insemination by rectal palpation, then

Conception rate was calculated as the percentage of pregnant animals out of the total inseminated animals.

## Results and discussion

### Estrus response and induction interval

The oestrus response and induction interval (hours) following oestrus induction in anoestrus buffaloes were displayed in Table I. Buffaloes induced by double synch therapy (group I) yielded 70 per cent oestrus response and the respective induction interval (hour) was  $69.63 \pm 1.86$ . The buffaloes which were subjected to estra-double synch protocol (group II) recorded response in 80 per cent (16) cases with corresponding induction interval of  $62.67 \pm 1.74$  hour. Lowest oestrus response of 20 per cent was observed in untreated group, where the average induction interval was  $260.40 \pm 3.46$  hrs. The estrus response and induction interval differed significantly ( $P < 0.05$ ) within treatment groups. The estrus response was significantly quicker and the induction interval was significantly shorter in treatment groups compared to untreated control as seen from the chi-square analysis. The present finding of estrus induction interval was in agreement with Machado and Kesler, 1996 [3] (40 to 60 hrs.) and Singh *et al.* (1998) [6]. However, the present induction interval was partially comparable to Sahu (2014) [5], who recorded lower value compared to the present observation. Similarly, GnRH-PGF<sub>2α</sub> combination protocol resulting in induction interval between 23 to 55hrs using ovsynch protocol or other synch protocols (Ghuman *et al.*, 2009) [2]. Estrus induction interval was achieved in 100 per cent cases by using CIDR in buffaloes (Sahu, 2014) [5].

**Table 1:** Estrus response and induction interval among post-partum anoestrous buffaloes to different treatment protocol

Group	No. of animals responded	Chi-square value	Induction Interval (in hours)
Group I (n=20)	14 (70.00%) <sup>a</sup>	10.94*	$69.63 \pm 1.86^a$
Group II (n=20)	16 (80.00%) <sup>a</sup>		$62.67 \pm 1.74^a$
Group III (n=10)	2 (20.00%) <sup>b</sup>		$260.40 \pm 3.46^b$

Different superscripts within column differ significantly ( $p < 0.05$ )

Figures in parenthesis indicate percentage\* $p < 0.05$

Sahu (2014) [5] achieved 90 to 100 per cent estrus manifestation in buffaloes by using crestear ear plant or PG-GnRH combination.

### Estrus characteristics

Estrus Characteristics in estrus induced buffaloes are presented in Table II. The duration of estrus (hrs.) were observed to be  $16.31 \pm 1.56$ ,  $18.13 \pm 1.28$  and  $11.25 \pm 2.25$  for anestrous buffaloes induced by double synch (Gr. I), estra double Synch (Gr. II) and control (Gr. III) respectively. The estrus characteristics in estrus induced buffaloes, showed that the duration of induced estrus both in Gr. I and Gr. II were significantly longer and the corresponding estrus behaviour scoring was significantly superior in induced buffalo compared to untreated animals. The duration of estrus recorded in the present study, is comparable with Ghuman *et al.* (2009) [2] following select synch and ovsynch protocol. However, shorter estrus induction interval was achieved by Sahu (2014) [5] with crestear ear implant.

**Table 2:** Estrus characteristics of induced oestrous among buffaloes

Group	Duration of oestrous (hrs)	Grade
Group I (n=14)	$16.31 \pm 1.56^a$	$2.9 \pm 0.81^a$
Group II (n=16)	$18.13 \pm 1.28^a$	$3.8 \pm 0.52^b$
Group III (n=2)	$11.25 \pm 2.25^b$	$1.2 \pm 0.35^c$

Different superscripts within column differ significantly ( $p < 0.05$ )

Estrus behaviour scoring was best in estra double synch protocol ( $3.80 \pm 0.52$ ) during the present study, followed by

achievement in double synch protocol ( $2.90 \pm 0.81$ ) and in control group ( $1.20 \pm 0.35$ ). The pronounced estrus scoring in hormonally treated animals due to effect of GnRH, PG and estrogen combinations, induced better estrus manifestation.

### Conception rate

The conception rates achieved during the study were 57.74 and 62.50 in Gr. I and Gr. II respectively in animals subjected to hormonal treatment. The overall conception rate was 60 per cent. However, the present conception rate is comparable to Miramahmoudi and Prakash (2012) [4] in buffaloes.

Evidence supported that GnRH-PG combination showed efficient ovulation response (90 % and above), turn over follicle or new follicle is more efficient due to GnRH. However, the discrepancy in induced ovulation and conception rate might be due to individual response and presence of dominant follicle at the time of treatment.

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